

SIEMENS
Ingenuity for life



product news

Innovations for the
Digital Enterprise

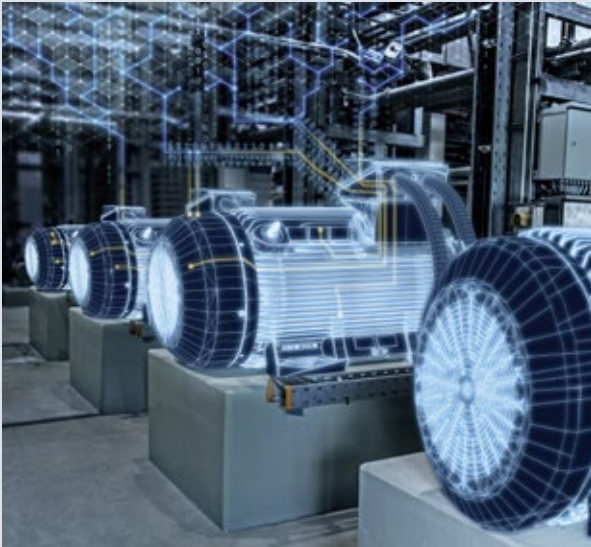
April 2017

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A new definition of performance

The next generation of the Simotics SD low-voltage motors

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TIA and the Digital Enterprise Suite

Digitalization across all levels

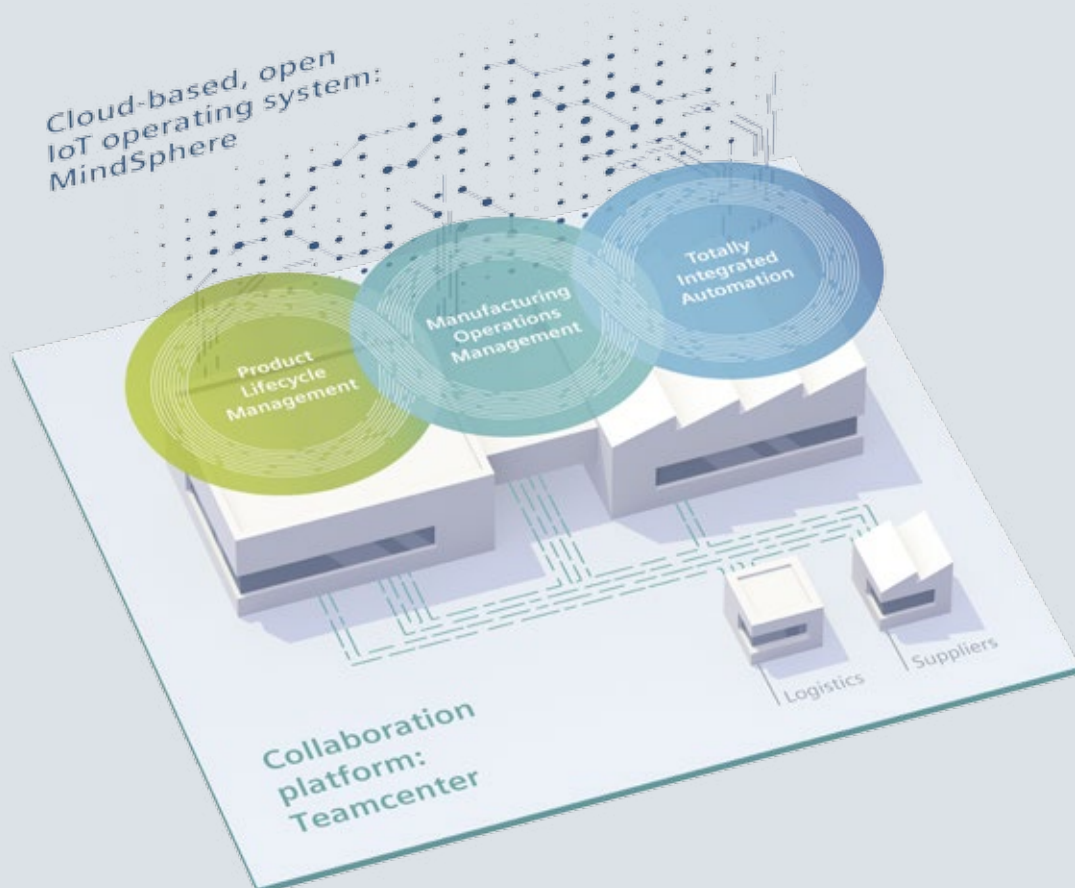
With the Digital Enterprise Suite, Siemens can already provide an optimized platform for Industrie 4.0 processes. The suite combines the advantages of the Product Lifecycle Management software from Siemens with the proven properties of TIA via a common database.

Totally Integrated Automation (TIA) stands for automation within the Digital Enterprise. The automation concept that is fit for the future with an integrated portfolio of hardware and software components enables efficient engineering and transparent operations. As an integral part of the Digital Enterprise Suite, TIA makes digitalization tangible and enables its step-by-step implementation.

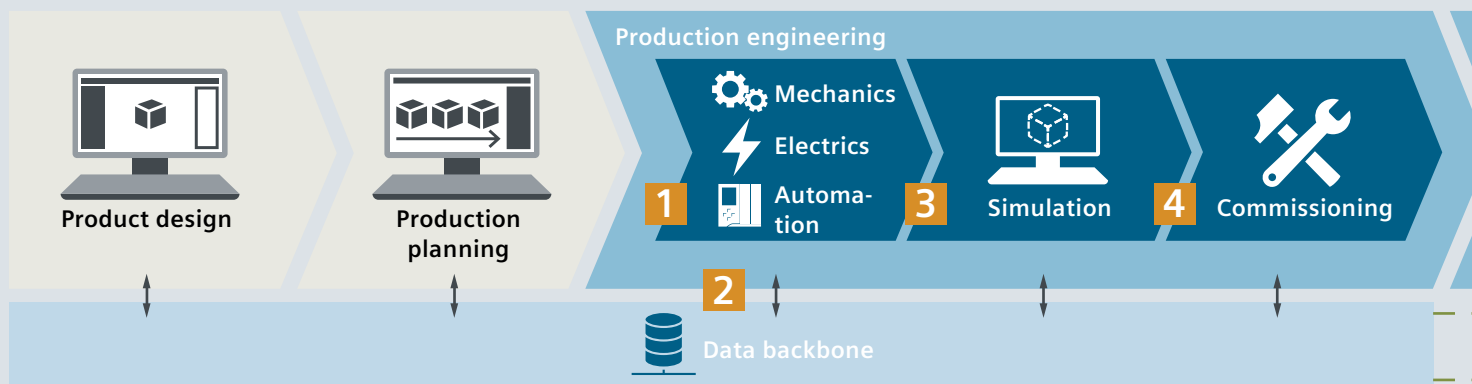
In addition to horizontal integration, the Digital Enterprise also offers vertical integration thanks to Manufacturing Operations Management (MOM), which creates the necessary link to the management level.

update, and approval is clearly visible to everyone and made available on Teamcenter. This means a flexible production organization, shorter project times thanks to simultaneous engineering, avoidance of duplicated work, comprehensive process control, consistent data for quality documentation, integration of mechanics, electrics, and automation for virtual commissioning, and much more. Users can even use the advantages of the worldwide interconnection today: for example, for data analysis in MindSphere. The scenarios on the following pages show the advantages that TIA offers as part of the Digital Enterprise Suite. ■

The advantages are very clear: everyone working in this process has the same consistent database and every change, [siemens.com/tia](https://www.siemens.com/tia)



Digitalization use cases



1 Automatic implementation of configuration tasks

Challenge:

Create project/machine versions with the same functions quickly and with little effort

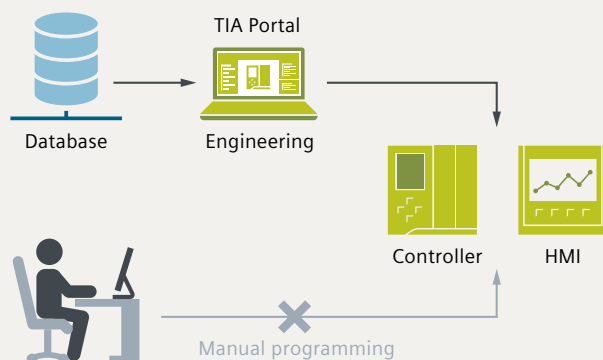
Solution by Siemens:

- Standardizes and versions the program modules using libraries within TIA Portal
- Transfers planning data from the TIA Selection Tool or Eplan via AutomationML
- Automatically tests the PLC software with Simatic S7-PLCSIM Advanced

- Generates the PLC program and the HMI visualization, including the necessary hardware, via TIA Portal Openness
- Generates the visualization using SiVArC based on the structure of the PLC program

Advantages:

Increased energy efficiency thanks to reducing redundant processes from the second machine onward, increased program quality due to avoidance of errors, higher efficiency for maintenance and adjustments



2 Connection of the product lifecycle management to automation

Challenge:

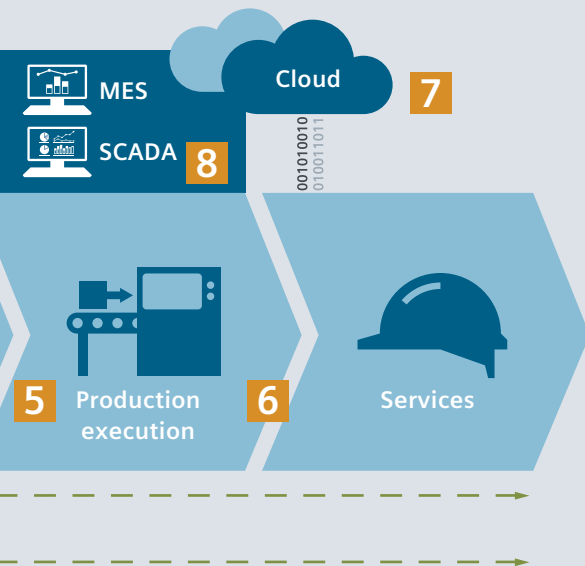
Avoid multiple data entry for mechanics, electrics, and automation, ensure project-wide data consistency, optimize version management

Solution by Siemens:

- Teamcenter is used as the common database for mechanics, electrics, and automation, data backbone throughout all product lifecycle phases of a machine
- Operators have direct access to automation projects and libraries in TIA Portal via TIA Portal Teamcenter Gateway

Advantages:

Structured data filing for all machine data, data consistency, no multiple data entries, versioning and approval of work status, collaboration of team members located at sites worldwide



3 Efficient cloud-based engineering

Challenge:

Reduce maintenance costs for TIA Portal installation, make changes to control functions on-site without programming device – with secure access to the machines' automation components across different subnets

Solution by Siemens:

- TIA Portal can be installed and maintained centrally in a private cloud
- Distributed work stations access the software via the TIA Portal Cloud Connector
- Even the plant control can be accessed via the Cloud Connector

Advantages:

Low hardware requirements for engineering stations, centralized software maintenance of TIA Portal, secure access to plants from a private cloud

4 Virtual commissioning

Challenge:

Decrease costs resulting from errors, shorten time to market by working in parallel, reduce risks during actual commissioning

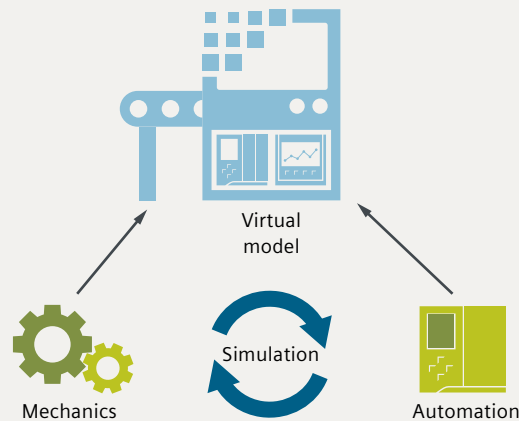
early stage of planning and engineering – even before the hardware investments.

Advantages:

Early optimization of the control program in a virtual environment instead of a real plant, increased planning security for the actual commissioning, all alternative concepts can be tested without risks

Solution by Siemens:

- Simatic S7-PLCSIM Advanced, the virtual controller for Simatic S7-1500 in TIA Portal, can be connected to simulation tools for imaging the production processes. This enables tests and optimization to take place at an



5 Integrated energy management

Challenge:

Combine energy and production data as the foundation for efficient energy management from planning to operation of the plant

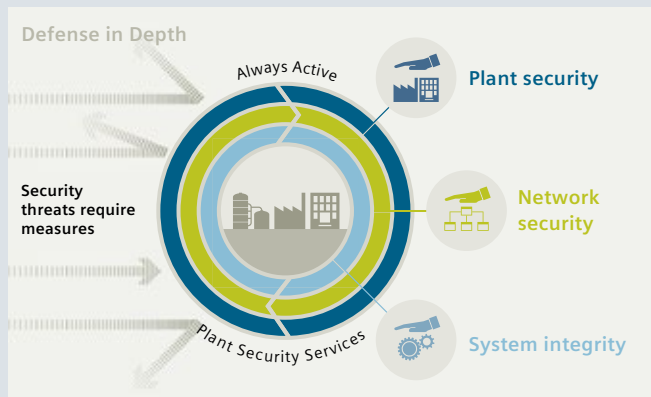
- Energy Manager Pro provides efficient energy management across different locations and has access to the recorded energy data

Solution by Siemens:

- Simatic Energy Suite enables measuring systems to be configured in TIA Portal; the energy management program is generated automatically, and visualization is part of the process visualization

Advantages:

Minimal engineering time for collecting, visualizing, and analyzing energy data; energy transparency as the foundation for modularly extendable energy management in accordance with ISO 50001



6 Machine and plant security

Challenge:

Avoid or reduce disruptions from attacks or malware, protect confidential data and intellectual property

Solution by Siemens:

- TÜV certificate for adhering to security standards according to IEC 62443-4-1 for the comprehensive development process of Siemens products in automation and drive technology, including industrial software
- TIA Portal and hardware portfolio with integrated security functions
- Defense in Depth as the comprehensive protective concept according to the recommendations of ISA99/IEC 62443, the leading standard for security in industrial automation
- Plant Security Services (page 50)

Advantages:

Reduced effort for increased plant availability and secure protection of intellectual property

7 Data collection for cloud services

Challenge:

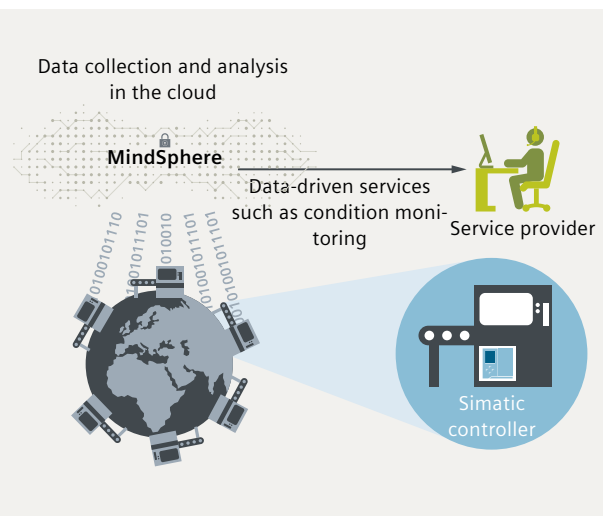
Monitor worldwide distributed machines and make processes more transparent

Solution by Siemens:

- MindSphere, the cloud-based, open IoT operating system from Siemens (page 48)
- Flexible connection options to MindSphere via function modules for Simatic S7-1500 or MindSphere gateways
- Secure data connection

Advantage:

Cost-efficient option for implementing data-driven services: for example, condition monitoring for increased plant availability



8 Communications

Challenge:

Create end-to-end communications as a prerequisite for accessing the advantages of digitalization

Solution by Siemens:

- Customized products and services for every communications task

- Profinet as communication standard for connecting production site and office
- Standard interfaces on all products
- OPC UA for communications across manufacturers, industries, and hierarchies

Advantage:

Transparent access to all production data, whether for analysis in the office or in the cloud

Totally Integrated Automation

A high level of efficiency is already demanded at the engineering stage, as the first step toward better production: faster, more flexible, and more intelligent. With Totally Integrated Automation, Siemens has an intelligent answer to this.

TIA Portal V14 SP1

More openness, consistent work processes

TIA Portal is a central access point to automation in the Digital Enterprise. Service pack 1 for TIA Portal V14 helps to further reduce engineering time. Its openness to other systems was increased even more by a standardized, bidirectional exchange of engineering data using AutomationML (Automation markup language): for example, using planning software such as Eplan, the TIA Selection Tool, or other CAE (computer-aided engineering) systems. The program interface TIA Portal Openness now enables the automated handling of hardware configurations, including fail-safe objects.

Work processes can now be created digitally and consistently with even greater success. Simatic S7-PLCSIM Advanced Controller functions, for example, can be simulated and tested early on. Virtual commissioning is possible in conjunction with simulated machine models.

TIA Portal even supports Windows 10 starting from V14 SP1 and V13 SP2. Passwords for intellectual property, write protection, and copy protection can be easily and centrally managed via the new password API. Authentication concepts are possible: for example,

using a dongle. The software option Simatic ProDiag for machine and plant diagnostics was extended by criteria analytics for focused error tracking. This allows certain states to be visualized retrospectively, so errors can be tracked even more efficiently.

In Simatic Step 7, the new single-block comparison enables faster editing. A detailed comparison is possible in offline/offline operation as well as in online/offline operation. ■

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

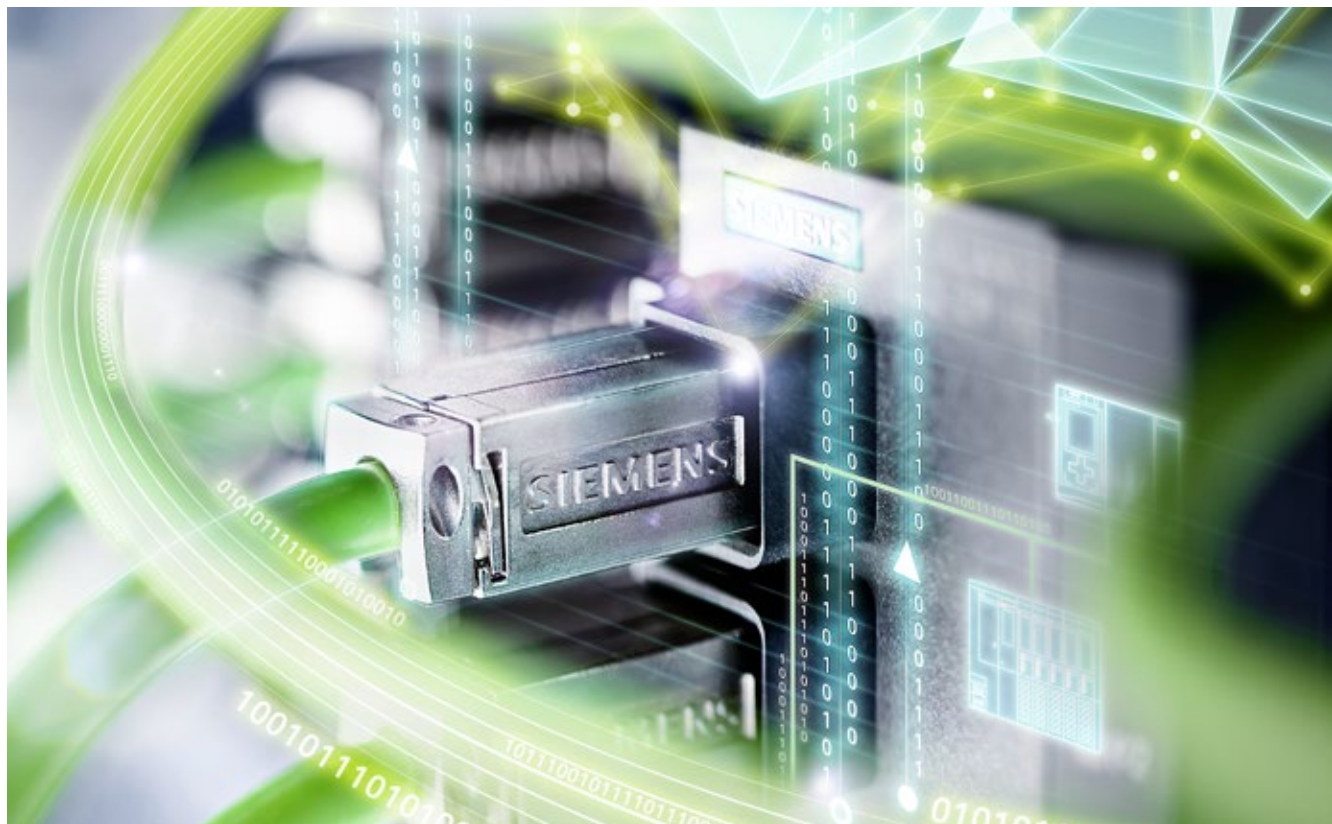


NEW FEATURES

- More openness and engineering efficiency
- AutomationML for standardized data exchange with planning software and CAE systems

Profinet communication standard

Fit for the digital future



The increasing digitalization of companies and the resulting networking of virtually every industry opens up significant economic potential. Industrial communication is a key element of digitalization. Exploding volumes of data, an increasing number of devices, real-time communications – the requirements on communications are constantly growing. Profinet is 100% Ethernet and therefore the perfect communication standard in the production industry and the perfect link between automation and IT. The combination of Profinet and OPC UA in one network provides continuous, open, and secure communications from the field level to the cloud.

Thanks to openness and standardization, Profinet is more than just a fieldbus – it offers added-value across all levels. Its flexibility enables the creation of customized machine and

plant concepts and its unrivaled efficiency allows for a perfect utilization of resources. Furthermore, its one-of-a-kind performance offers high precision and product quality. For continuous Ethernet-based communications from the sensor to the cloud, you now only need one cable on a single network via Profinet, OPC UA, and TCP/IP. Because Profinet is more powerful, flexible, and efficient than other standards and provides even more openness and security, Siemens uses it as a communication standard for the entire TIA portfolio.

Profinet's openness now makes it possible to connect the Simatic Controller with the CAN world via the new Simatic PN/CAN link. The continuous projecting of the Simatic PN/CAN link is integrated in TIA Portal (beginning with V14). The most common CAN profiles are supported, and there is no

more need for additional software tools such as CAN 2.0A/B and CANopen Manager. This increases engineering efficiency and results in the shortest possible startup times. ■

➤ [siemens.com/profinet](https://www.siemens.com/profinet)

NEW FEATURES

- Integrated in TIA Portal
- Support of common CAN profiles such as CAN 2.0A/B, CANopen Manager, CANopen Slave
- Existing certifications (CE, UL, and cULus, EAC and various certifications for shipbuilding)

Automation Systems

Simatic automation systems offer the right product for every application. The new controller generation consists of Basic, Advanced, Distributed, and Software Controllers. The Simatic Controllers are available in a fail-safe version, the S7-1500 Advanced Controller, now also with advanced motion control functionality.

Simatic S7-1500 – CPU firmware V2.1 intelligent power supplies

No data loss during power failures

The intelligent PS 60W 24/48/60V DC HF power supply buffers the power during outages, which enables CPU data to be retained – without a battery and therefore maintenance-free. This shortens the restart time of machines and plants, because no data is lost. The entire memory of all CPUs can be saved in both standard and fail-safe applications. This allows manufacturing applications that previously used a Simatic S7-400 now to be switched to the new Simatic S7-1500 without limiting the retentive

behavior. The system's power supply makes handling large data volumes such as setup or parameterization data much easier. CPU firmware version V2.1 is required in order to use the new power supply.

This CPU firmware version V2.1 also enables the evaluation of information on the Simatic Memory Card (SMC) via the "GetSMCInfo" component in the user program of the S7-1500. This includes card-size and already-used memory as well as the number of

NEW FEATURES

- Power buffering to safeguard all data in the CPU
- Feed-in of 60 W to the backplane bus
- Power supply balance integrated in TIA Portal
- Integrated module diagnostics

write-and-erase operations performed on the card. Users making especially intensive use of the recipes and archives will value the information on the "operating life" of the SMC, which permits them to replace the cards as a precaution, if required. ■

➤ siemens.com/s7-1500



Siwarex WP521 ST/WP522 ST

Integrated weighing technology



NEW FEATURES

- Siwarex WP521 ST: single-channel version for setting up one scale
- Siwarex WP522 ST: two-channel version for setting up two scales
- Seamless integration into Simatic S7-1500
- Siwatool V7 service software for quick commissioning even with no Simatic knowledge
- The many interfaces on board increase the flexibility

The Siwarex WP521 ST and WP522 ST weighing electronics are the new technology modules for the Simatic S7-1500 Advanced Controller family. The controllers are optimally prepared for use in platform scales, for monitoring filling levels of silos and bunkers, and for scales in potentially explosive areas. Thanks to seamless integration in Simatic S7-1500, the advantages of this automation system can easily be used. And thanks to the continuity of the mounting technology, programming, and operation/control, it is possible to create the perfect solution for a wide variety of plants and requirements. In this process, the free, "ready-for-use" application helps create

customer-specific and industry-specific solutions quickly and efficiently.

Different interfaces and connection options for the communications are included ex works: the Simatic S7-1500 system bus, Modbus TCP/IP (Ethernet), Modbus RTU (RS485), four digital outputs, and three digital inputs. In addition, both the automatic monitoring function of the load cells' impedance as well as the process and diagnostic alarm functions increase plant security and plant availability respectively. ■

➤ siemens.com/siwarex



CPU 1511TF-1 PN and CPU 1515TF-2 PN/Simotion V5.1

Scalable motion control solutions in TIA Portal

The two fail-safe CPUs 1511TF-1 PN and 1515TF-2 PN complete the portfolio of the Simatic S7-1500 T-CPU. This gives users the maximum functional and consistent end-to-end scalability within the Simatic S7-1500 Advanced Controllers – for standard, safety, and motion control applications. The Simatic S7-1500 T-CPU and the Sinamics V90 servodrive system with Profinet enable demanding mid-range motion control tasks such as gearing and camming to be efficiently realized in TIA Portal V14 SP1.

With the new 5.1 software version of the Simotion high-end motion control system, programmers can increase both the efficiency and quality of their software. The Simosim simulation module integrated in the engineering system enables immediate software testing during program development – with no need for additional hardware, and including the configured axes and kinematics.

This gives machine manufacturers fault-free software at an early stage, resulting in a significant reduction in commissioning time. Because the necessary adjustments in the field can be tested in the simulation first, preparation time and downtime are reduced as well.

Simotion V5.1 also makes possible a seamless integration of the simulation in the entire digitalization process: by connecting simulation software such as Simit or Mechatronic Concept Designer (MCD), machines can be commissioned virtually. With OPC UA and IoT 2040, the OEM also makes use of the advantages of open communications for the ongoing optimization of its plants in the field (for example, predictive maintenance). ■

➤ siemens.com/t-cpu
 ➤ siemens.com/sinamics
 ➤ siemens.com/simotion

NEW FEATURES

Simatic S7-1500 T-CPU

- Maximum functional and integrated scalability within the Simatic S7-1500 Advanced Controllers
- Perfect interaction between the Simatic S7-1500 T-CPU Advanced Controller and the scalable Sinamics V90 PN drive system or the new Sinamics S210 servodrive system (commissioning via web server)

Simotion V5.1

- More efficient software development with simulation module in the engineering environment
- Shortened commissioning, preparation time, and downtime
- Perfect integration of the simulation module into the entire digitalization process

Simatic ET 200MP/Simatic ET 200SP

New modules: cost-effective and fail-safe

With the I/O modules of the Simatic S7-1500 in a distributed setup, the Simatic ET 200MP provides a station design that is both modular and scalable. The basic interface module (IM 155-5 PN BA) is new in the portfolio. The cost-effective Profinet interface module for up to 12 standard modules supports functionalities such as IM exchange without reassigning address data, shared devices, and MSI/MSO. It offers an optimal price/performance solution for setting up small and medium-sized configurations, which enables consistent scalability of the system in terms of costs, functionality, and performance.

The Simatic ET 200SP distributed I/O system is especially easy to operate and ensures maximum economy in the control cabinet due to its compact design. A new feature of the ET 200SP

is the fail-safe, digital output module (F-DQ 8x24VDC/0.5A PP HF), perfectly suited for the easy and safe I/O coupling of individual fail-safe systems such as interlinked single machines. Also new is the Bürkert Airline SP valve island system model 8647, which, thanks to its consistently modular design of pneumatic interfaces, is suited for solving varied and complex control functions. It is compatible with the ET 200SP I/O system and integrated into TIA Portal. ■

➔ siemens.com/et200



NEW FEATURES

Simatic ET 200MP

- Cost-effective basic interface module for setting up small and medium-sized configurations and consistent scalability

Simatic ET 200SP

- Fail-safe digital output module for easy and safe I/O coupling of individual fail-safe systems
- Bürkert Airline SP valve island system model 8647 for varied and complex control functions



TIA Selection Tool

Ready for TIA Portal

With the TIA Selection Tool, it is possible to select, configure, and order devices for Totally Integrated Automation (TIA). The device selection can be imported into the hardware configuration of TIA Portal. Interfaces with electrical planning tools such as Eplan are another contribution to integrated engineering that makes multiple inputs unnecessary. The TIA Selection

Tool also includes migrators that propose suitable products for a retrofit or a possible switch from third-party systems to Siemens systems. Because the device limits are shown, users can rest assured that they are correctly dimensioning their plant with the desired capacity reserves. ■

➔ siemens.com/tst

NEW FEATURES

- Interface to TIA Portal
- Interface to electric planning systems
- Display of device limits for optimal plant dimensioning



Industrial PCs

With their compact, fanless embedded IPCs and powerful expandable high-end IPCs, the products from the Simatic industrial PC range are the ideal basis for many PC applications in the manufacturing environment.



Simatic IPC327E / IPC377E

Industrial PC technology at attractive prices

Siemens is expanding its industrial PC portfolio for cost-sensitive areas of application with Simatic IPC327E and IPC377E. The Panel PC and the Box PC complete the Basic IPC range. Along with the IPC347E Rack PC, the three devices cover the lower power range of the wide Simatic IPC portfolio.

With the new Basic IPCs, it is possible to realize applications in the industrial environment quickly and efficiently with no special requirements.

The IPC327E and the IPC377E feature

up-to-date PC technology and a variety of interfaces for easy integration into new and existing systems. Instead of complex configuration options, the user can choose from eight predefined versions. They are the perfect supplement for the freely configurable versions of the IPC product portfolio. ■

➤ siemens.com/ipc327e

➤ siemens.com/ipc377e

NEW FEATURES

- Fast delivery, since all eight versions are available directly from the warehouse
- Simatic quality for reliable use in industrial environments
- Up-to-date PC technology and interface variety (up to 6xCOM, 6xUSB, VGA, and DisplayPort)
- Fanless design – as Box PC or Panel PC with display sizes of 12", 15", and 19"



NEW FEATURES

- Slim design for modern operation concepts
- Multitouch in widescreen format for the IPC477E in 15"/19"/22", IPC277E in 15"/19", and IFP in 15"/19"/22"
- Recognition of operating errors (e.g., with the ball of the thumb)

Simatic IFP and Simatic IPC277E / IPC477E Multitouch

Innovative operation in a slim design

Operating and monitoring plants and machines efficiently never looked better than with the Simatic flat panel monitors and panel PCs, which represent the intelligent integration of a modern, slim design with innovative ease of operation. Their projected capacitive touch technology, specially developed for industrial applications, allows for intuitive and efficient single-digit or multiple-digit operation as well as gesture and two-hand operation.

With the new multitouch devices with glass covers, the IPC277E (15-/19-inch) and the IPC477E (15-/19-/22-inch), as well as the IFP with 15-inch, 19-inch, and 22-inch displays, Siemens has expanded its portfolio of Simatic IPCs. ■

➤ siemens.com/ipc

Human Machine Interface

Simatic HMI – Taking efficiency to a new level: that is the motto of the seamless, consistent human-machine interface product range that allows the most diverse applications to be implemented efficiently and economically.



Simatic HMI Comfort Panels PRO

Convenience in the high-end range

Siemens is extending its system range of completely IP65-protected HMI devices by Simatic HMI Comfort Panels PRO (PROtected) for visualization and automation without control cabinets. The new panels with 12-, 15-, 19-, and 22-inch screen diagonals are equipped with the high protection type IP65 (NEMA4), just like the PRO devices in the Simatic IFP and IPC series. Thanks to high performance and functionality and numerous integrated interfaces, they offer the greatest possible convenience for high-end applications and are especially suited for realizing powerful visualization tasks

in machine-related areas. With the benefit of the flexible installation options – directly on the machine through special adapters, on a supporting foot, or on a bracket system – the user can easily operate the panels and always has the perfect view of both the panel and the process.

Components that can be installed on the PRO devices – consisting of basic device, expansion component, installation adapter, optional keyboard, and keyboard tray – now offer even more operation options. With customized

NEW FEATURES

- Scalability of customized system solutions
- Configuration of high-end visualization tasks directly on the machine
- Benefits from proven standard components and economical engineering

system solutions with standard components, they make trouble-free adjustments to individual customer desires possible and convince with their simple installation and commissioning, easy engineering, and efficient operation. ■

➤ siemens.com/simatic-hmi-pro



Simatic WinCC V7.4 SP1

Mastering production

Service pack 1 for the WinCC V7.4 SCADA system extends the options for WinCC/PerformanceMonitor and WinCC/SES (sequence execution system). WinCC/PerformanceMonitor allows you to calculate and analyze plant-specific parameters; WinCC/SES is a sequence control for recipe and

sequence-based processes that makes manual interaction possible during operation. In the new version, both options are even more efficient – in engineering and operation management. ■

➤ siemens.com/wincc-v7

NEW FEATURES

WinCC/PerformanceMonitor

- Efficient engineering thanks to complete integration into the WinCC basic system
- Import configuration data from Excel and export them to Excel
- All important equipment data are displayed in Performance GanttControl for quick identification of optimization potentials

WinCC/SES

- Special sequences can be modeled in engineering
- SES is available as operating system service
- Run several controls at once during operation

Power Supplies

A reliable DC power supply is essential for efficient plant operation. The portfolio of Sitop power supply units and add-on modules can protect companies in any industry in the world from plant downtime and production losses.



LOGO! Power

Lean power

Siemens launches the fourth generation of the compact LOGO!Power power supplies in the LOGO! 8 module design for industrial and building automation. The one-phase power supply units are available in the sizes 18 mm, 36 mm, 54 mm, and 72 mm. They supply 24-V consumers with an output voltage of 0.6 to 4 A, reducing the unit size by 18 mm per performance class compared with the third generation. There are also variants available with 5 V, 12 V, and 15 V. The new generation also provides a power reserve of 150% (typically 200 ms) when capacity loads with a high inrush current are started up.

The increased efficiency of up to 90% over the entire load range – at a wide input voltage range from 85 to 264 V AC or 110 to 300 V DC respectively,

and low no-load losses of 0.3 W in standby mode – proves the high energy-efficiency of the power supply units.

The new devices provide an extended temperature range of -25°C to $+70^{\circ}\text{C}$ (derating as from $+55^{\circ}\text{C}$) and an extensive package of certifications (CE, cULus, FM, GL, and ATEX). Different types of mounting – standard rail or direct mounting – offer flexibility in different situations. The current output voltage can be determined with the help of the integrated power monitor, meaning that the supply cable does not need to be disconnected.

This product series is especially compatible with the LOGO! Family: for example, the LOGO! logic module. ■

➔ siemens.com/logo-power

NEW FEATURES

- Very high efficiency over the entire performance range
- Considerable reduction of size by 18 mm compared with previous performance class
- Fault-free connection of loads with high inrush current, thanks to power reserves when starting up and constant power in case of overload
- Mounting on standard rail or direct assembly
- Power monitor to measure the output current (not available for 18-mm devices)
- Extended operating temperature range from -25°C to $+70^{\circ}\text{C}$ (derating as from $+55^{\circ}\text{C}$)
- Worldwide use thanks to extensive certifications

Sitop PSE200U selectivity module with NEC Class 2

Portioned load current

The Sitop selectivity module distributes the load current over several 24-V circuits and monitors them reliably to see if there are overloads or short circuits. The variants with 4 x 3 A output current are now also available in the NEC Class 2 version with common signaling contact or single-channel signaling. In accordance with the UL standard, every output – even in case of failure – is limited to 100 VA. One circuit each of the selectivity module is able to supply components with the approval “for use with NEC Class 2 only.” Compliance with the U.S. standard for safety and fire protection facilitates approval and cabling in the U.S. as well as the use of cost-efficient products in the control circuit. ■

➔ siemens.com/sitop

NEW FEATURES

- Variants with common signaling contact and single-channel signaling
- 24 V/4 x 0.5 - 3 A, with power limitation of every circuit to a maximum of 100 VA according to NEC Class 2
- Substantially lower costs for cabling and approval in the U.S.
- One powerful 24-V power supply instead of several 100-W PSUs in NEC Class 2
- Fault analysis of single-channel signaling through free-of-charge function modules for Simatic S7-300/400/1200 and 1500



Sitop PSU8600 and DC UPS Sitop UPS1600 with OPC UA server

Premiere: Open communication

NEW FEATURES

- OPC UA server integrated in the Sitop PSU8600 and UPS1600 firmware
- Existing devices can be upgraded free of charge via firmware download
- Power supply parameterization and diagnosis through OPC UA client
- Plant integration of power supply regardless of supplier of the automation devices

The OPC UA server functionality becomes an integral part of the Sitop PSU8600 power supply system and the uninterruptible 24-V power supply Sitop UPS1600. This means that, for the first time, a network-compatible power supply communicates via the open communication interface. Complementary with Profinet communication, the OPC UA server enables direct integration into automation applications with OPC UA clients from

different suppliers, such as controls or PCs. In this process, the user has all parameterization functions and diagnostic and operating information from the power supply system and the DC UPS available through the OPC UA data model. With OPC UA and Profinet, Sitop PSU8600 and UPS1600 support the open standards for communications concepts for Industrie 4.0. ■

➤ siemens.com/sitop



POWER SUPPLY UNIT SITOP PSU8600

• Setting options (per output):

- Switch-on/switch-off
- Overload behavior, switch-on delay, parallel circuits, buffer behavior in case of network failure
- Output voltage from 5 to 28 V DC, also dynamically, such as for direct current motors
- Release current in case of overload, maximum current, and thresholds for preventative maintenance



• Diagnostic options:

- Early detection of dynamic, continuous, or agglomerating overload conditions with the help of up-to-date current values
- Status notification of outputs (on, off, overload)
- Detection and logging of short-term network and phase failures for analysis of network quality
- Collection of energy data (power, voltage) output for determination of potential energy savings
- Pre-warning for system overload and excess temperature



UNINTERRUPTIBLE POWER SUPPLY SITOP UPS1600

• Setting options:

- Buffer time
- Voltage threshold for buffer beginning
- Reactions on status and alarm notifications of UPS: for example, when starting or closing programs



• Diagnostic options:

- Information on device data and parameters
- Information on status of DC-UPS:
 - Upcoming alarms
 - Alarm process
 - Load current
 - Input voltage
 - Remaining buffer time
 - Battery temperature
 - Battery charging
 - Measured load current
 - Battery capacity

The new Sinamics S210 servodrive system

The highest level of dynamic range and precision for many applications

In addition to top performance and ease of use, the new Sinamics S210 servodrive system scores with a high level of dynamic range and precision, integrated safety functions, and simple configuration and commissioning.

The new Sinamics S210 single-axis converters, available in four performance classes from 100 to 750 W, are made specifically for use with the newly-designed Simotics S-1FK2 motors, making the configuration much easier for machine manufacturers. After selecting the motor according to dynamic range and torque, the matching converter is displayed automatically – a decisive advantage when planning systems. Commissioning the Sinamics S210 is very easy as well: just open up the integrated web server and automatically optimize the control parameters with one-button tuning – that's it. You can factor in the behavior of the connected mechanical systems in this process using different selectable levels of the dynamic range.

There are also safety functions integrated into the new converter: STO (safe torque off) and SS1 (safe stop 1) in the first units. Both safety functions can be controlled via Profisafe, and STO via a terminal as well. Extended safety functions will be available soon.

Ideal motors

The new Simotics S-1FK2 servomotors matched to the S210 converters make moving a wide variety of loads possible in a highly dynamic and precise manner. That is why they are being used in particular in machines for packaging, handling, wood and ceramics processing, and digital printing. The motors have their extremely high level of dynamic range and precision thanks to the interaction of the fast scanning capabilities and the sophisticated control algorithms of the Sinamics S210 – as well as the high-quality feedback system and the combination of low rotor inertia and high overload capacity. Motors with shaft heights of 20 mm, 30 mm, and 40 mm are currently available and are built to match the 1AC 230-V converters.



Easy connection to motors and control system

The motor is connected to the converter via a one cable connection (OCC), which means that the wires for the power, encoder, and brake are combined into just one single cable and one single motor plug. The new OCC's diameter is only 9 mm, making it thinner, lighter, and more flexible than the previous power cable. The wiring on the converter is just as easy thanks to user-friendly, self-locking connectors and easy-to-access, removable push-in terminals on the front.

A Simatic S7-1500 or S7-1500T controller handles the entire positioning function for the connected motor axes using its extended motion-control functionality. The entire range of functions of the Sinamics S210 is therefore focused primarily on the core functions of the highly dynamic control of the motor axis. The converter is connected to the higher-level control system via Profinet. ■

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

Integrated Drive Systems

Siemens offers all-in-one solutions for the entire drive technology that can be seamlessly integrated into any automation environment and throughout the entire lifecycle – for more efficiency, reliability, and productivity.

Sinamics V20 Smart Access web server module

Wireless access

The performance range of the Sinamics V20 has been extended by adding the optional Sinamics V20 Smart Access web server module. You can simply plug the device onto the frequency converter and commission and operate it, as well as perform diagnostics and maintenance wirelessly via a mobile device or laptop PC. The Sinamics V20 Smart Access user interface is designed like an app, making it easy and intuitive to operate. In addition, thanks to the web server technology, no additional data or applications have to be installed; all you

need is an HTML5-capable web browser. This gives users free choice of terminal equipment, letting them use familiar devices as the control panel. Functionalities such as fast commissioning, running the motor in jog mode, setting and changing parameters, monitoring the converter status, and diagnosing error or warning messages offer users even more convenience. ■

➔ siemens.com/sinamics-v20



Sinamics V90 Profinet

Integrated basic positioner, new motor design



Labeling, filling, and sealing machines, automated palletizers, and storage and conveyor systems are used for positioning tasks in the packaging industry, conveyor technology, and metal forming. The Sinamics V90 servodrive system is the perfect drive system for these machines. The Profinet version of the drive system is now available with the EPos basic positioner, which makes it possible to save up to 16 target positions in the drive system, including the matching speeds and accelerations. The system also supports "manual direct input" (MDI) mode: after entering the positioning parameters such as speed, route, target position, and acceleration rates in the Profidrive interface, the corresponding start command is activated in the higher-level control system.

There are also updates on the motor side: the Simotics S-1FL6 low-inertia motor has been equipped with a 21-bit encoder, and the design of the Simotics S-1FL6 high-inertia motor has been updated. ■

➔ siemens.com/sinamics-v90

NEW FEATURES

- Faster commissioning due to easier handling of positioning tasks
- Easy integration into the Simatic control system
- Point-to-point positioning via PLC with no need for positioning functionality
- Motor is easier to connect and more compact

Sinamics G120P

Power module for higher voltage levels

The Sinamics G120P converter has been updated with two new power modules: PM240P-2 for installation devices and cabinet units and PM330 for industrial applications. With the PM240P-2, installation devices are now available for voltage levels at 400 V and 690 V, in protection class IP20, and in the power range from 22 kW to 132 kW, and cabinet units in protection classes IP20 to IP55 in the power range from 75 kW to 132 kW. The sturdy devices can withstand operating temperatures from -10°C to $+50/60^{\circ}\text{C}$. Integrated safety functions up to the highest safety level, SIL 3, guarantee greater process safety. A link reactor reduces mains feedback and increases the output voltage to 98%. With the PM330, Siemens is expanding its portfolio of wide-range voltage devices in the range from 315 kW to 630 kW. Reducing the cabinet width from 1,000 mm to 400 mm reduces the space required by 60%, and variable-speed equipment fans significantly increase energy efficiency. ■

➤ siemens.com/sinamics-g120p



HIGHLIGHTS

- Increased energy efficiency thanks to higher output voltage (PM240P-2)
- Increased process safety due to integrated safety functions
- Sturdier construction for demanding ambient conditions (PM240P-2)
- Space savings of 60% (PM330)
- Increased energy efficiency through use of variable-speed equipment fans (PM330)



Sinamics IOP-2 – the new generation of Intelligent Operator Panels for Sinamics G

New design, packed with more functions!

NEW FEATURES

- Intuitive user interface – membrane keypad with a central sensor control field
- High-contrast color display with various display options
- IOP-2 device design, open for future expanded functionality (e.g. device functions, wizards, languages)
- Cloning function for fast series commissioning of the converters
- Fast diagnostics using local plain text display
- Simple, individualized local drive operation (start/stop, setpoint input, direction of rotation change)

The new flat intelligent operator panel IOP-2 enables faster commissioning of Sinamics G frequency converters and makes adjusting the settings during operation easier. The intuitive user guidance from the previous model has been redesigned with the future in mind: for example, the new color display (320 x 240 pixel resolution) offers an additional level of information depth, especially for graphical evaluations. Thanks to the integrated membrane keypad with a central sensor control field, it can be used in environments that require protection type IP55. The innovative central multifunctional sensor control field supports users in setting selections, similar to working on a touch panel by swiping with your finger. There are three options available for installation: plugging it directly into the control

unit of the converter; installing it in the door of the control cabinet for operation from outside; or installing it via IOP-2 handheld unit for mobile wired operation at sites that are hard to reach.

Future updates will also be simple: the new system hardware and the standard USB interface make it easy to install firmware updates and add functions at any time.

The new Sinamics IOP-2 is compatible with the following converter series: Sinamics G120, Sinamics G120C, Sinamics G120P, Sinamics G110D, Sinamics G120D, Sinamics G110M, and Simatic ET 200pro FC-2. ■

➤ siemens.com/sinamics-accessories



Sinamics Perfect Harmony GH180 next generation

Minimum floor space with maximum availability

With the new generation of the Sinamics Perfect Harmony GH180, Siemens has optimized its proven medium-voltage converter. The converter has a new printed circuit-board cell design with smaller and lighter cells, which makes it more powerful – thanks to the new transformer design. This minimizes the mounting width of the new Sinamics Perfect Harmony GH180 by about 20% compared with similar converters in this class available on the market. The lighter cells can be removed without tools, and the front fan is replaceable, significantly improving its user-friendliness. Due to its compliance with almost all motor types, the medium-voltage converter is appropriate for a wide variety of applications in energy production and mining as well as in the metal, cement, chemical, water, oil, and gas industries. ■

NEW FEATURES

- Optimized footprint due to innovated cells
- Easy servicing thanks to easy fan access from the front
- Optimized delivery time
- Low-voltage compatibility – supports voltages of 480 V and 600 V

➤ [siemens.com/sinamics-perfect-harmony-gh180](https://www.siemens.com/sinamics-perfect-harmony-gh180)

Simotics HV C flameproof and water-jacket cooled

Revolutionary cooling concept

With the Simotics HV C, a whole new series of ultra-compact high-voltage AC motors is available in flameproof and water-jacket cooled versions. The water-jacket cooled version offers a distinct power boost at the same size; the flameproof version sets new standards with a maximum degree of power density.

For the patented cooling concept in IC 411 used in the air-cooled, flame-proof version, elements of the tube cooling were integrated in the fin-cooled housing. This significantly improves the cooling of the motors. At the same time, a modern ventilation design with an interior cooling cycle ensures optimal heat extraction and therefore smooth operation and a very long motor service life. A new, flameproof terminal box design, identical for 6 kV and 11 kV, saves several hundred kilos of weight and lots of space.

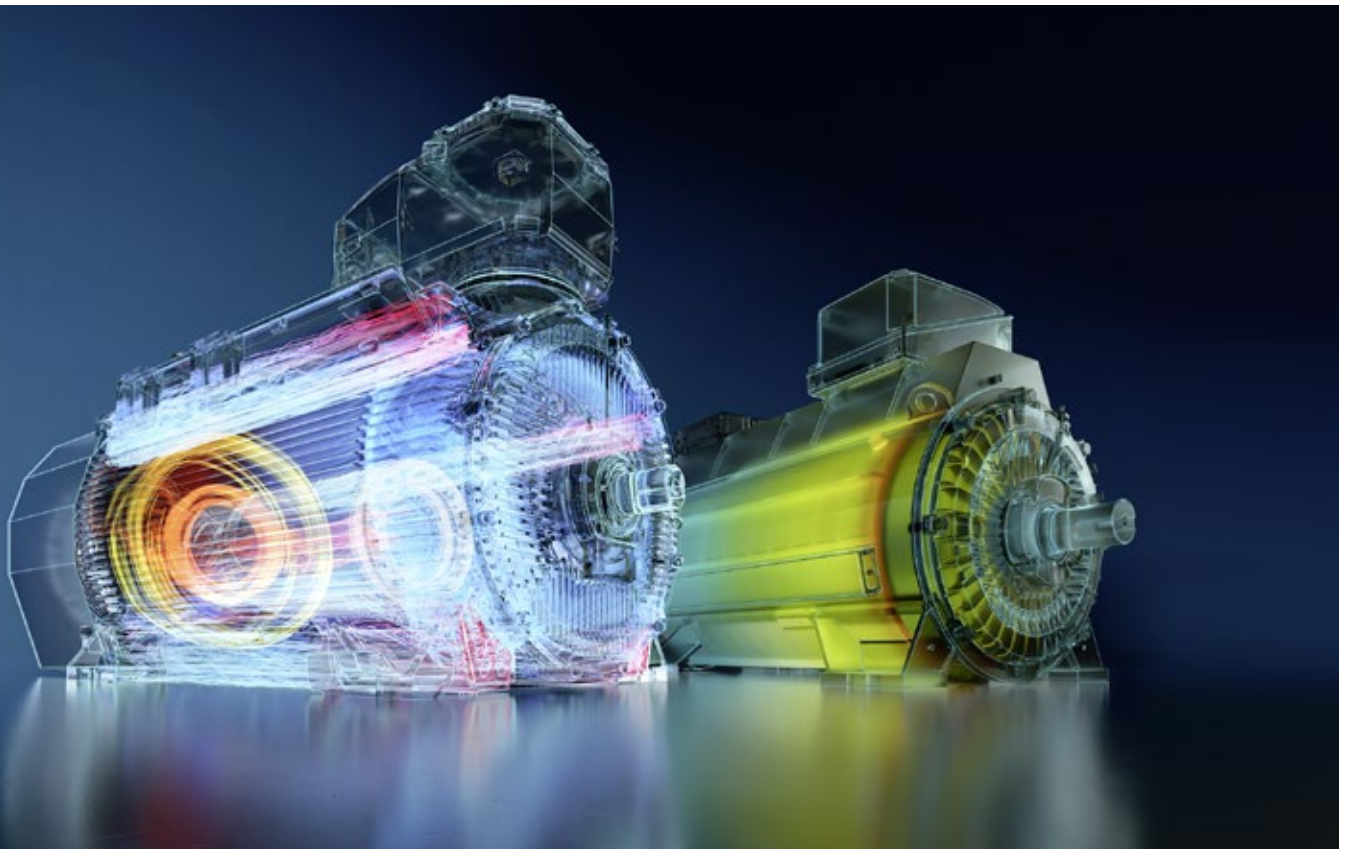
The innovative cooling concept used in the water-jacket cooled version has significantly improved both temperature distribution and heat extraction. The considerable power boost at the same size makes it possible to expand the performance range and therefore its areas of application. The interior channels for cables make the motors exceptionally

rugged, even under extreme conditions. It means that the cabling is protected from a wide variety of environmental influences, resulting in less complex cabling. ■

➤ [siemens.com/simotics-hv-c](https://www.siemens.com/simotics-hv-c)

NEW FEATURES

- High power density and robustness
- Reduced noise level
- New motor feet design for improved vibration behavior
- Variable terminal box position for more flexibility in system planning
- Integration in data-based service concepts with cloud-based data analysis, for higher availability of motor, drive system, and plant
- Innovative and patented air-cooling concept





Simotics synchronous-reluctance motor with Sinamics S120 frequency converter

High-performance and energy-efficient combination

HIGHLIGHTS

- Motor control optimized for synchronous-reluctance motors
- Motor and regenerative operation optimized in terms of energy efficiency and dynamics
- Operation with or without an encoder
- Similar dynamics to permanent-magnet synchronous motors in terms of torque steps
- Better dynamics than asynchronous motors in terms of speed steps
- Safety functionality

Simotics synchronous-reluctance motors can now also be operated with the Sinamics S120 frequency converters in the new firmware version 4.8, allowing the entire functionality and complexity of the modular Sinamics S120 range of products to be utilized. The system can be used wherever the performance or efficiency of asynchronous motors is insufficient, but the highest level of dynamics is not necessary for permanent-magnet synchronous motors. That is true for various applications in general machine building, for example: winders, extruders, and servo-pumps. The safety functionality and high energy efficiency are two very persuasive features offered by the system consisting of Sinamics S120

and Simotics reluctance motors. In the partial-load range in particular, synchronous-reluctance motors have efficiency levels that correspond to those of highly efficient permanent-magnet synchronous motors. The system costs are also considerably lower than those of permanent-magnet synchronous motors and less than those of Simotics 1LE1 IE4 asynchronous motors. Thanks to the high energy efficiency and the low initial costs, it usually takes less than 12 months to achieve full return on investment when compared to the cost of operating IE2 drives. ■

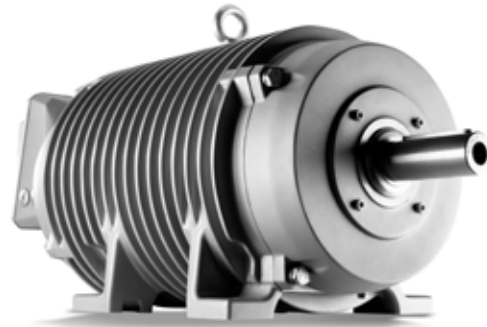
➤ siemens.com/drivesystem-reluctance

Simotics DP roller table motor

High resistance to vibration and shock

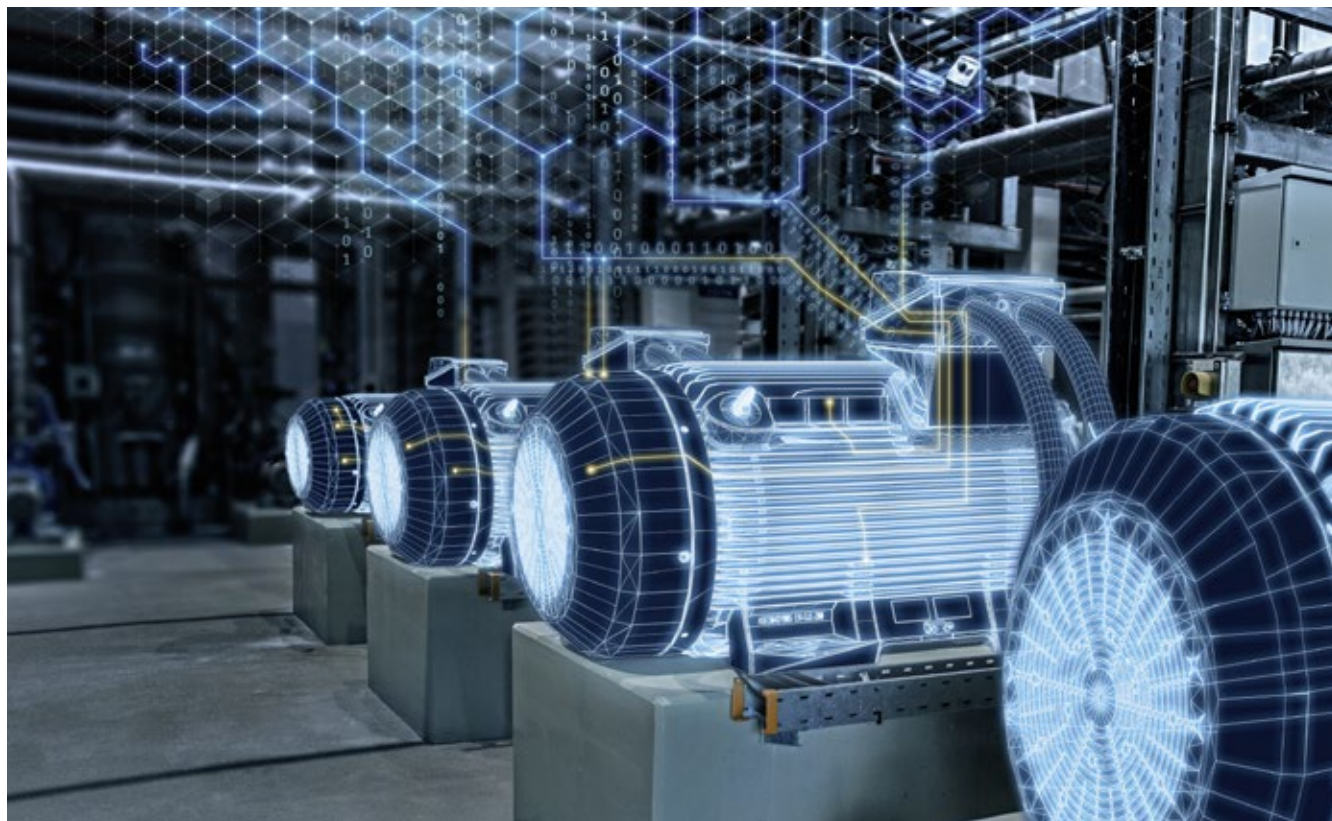
The new Simotics DP roller table motor series supplements the Simotics DP steel plant motors. Siemens can now offer a completely innovative product range for project operations in the metals industry: users receive all transport applications from one source. The Simotics DP 1PC1423 roller table motors with shaft heights from 112 to 200 are based on the existing 1LE1 motor platform. With its torsionally-stiff round rib enclosure and the end shields made of GGG, the roller table motor is perfectly suited for the highest requirements in the mechanical environment. This includes rolling, reversing, and transporting red-hot metal blanks under the highest mechanical loads and extreme environmental influences such as scale, dust, and water. ■

➤ siemens.com/simotics-dp



NEW FEATURES

- Increase in power/torque by about 25% compared with the previous series
- System-tested operation with the Sinamics S120 converter
- High resistance to vibration and shock up to 3M6 according to EN 60721-3-3
- Standard protection type IP66, optional "Special sealing system – corrosion protection" for especially high environmental requirements



Simotics SD next generation

A new definition of performance

The next generation of the Simotics SD low-voltage motors has been further developed so that all future challenges in the area of drive technology can be mastered with these motors. The basis is a robust and compact cast-iron motor with a future-oriented energy-efficiency concept that boosts competitiveness. The new design of the motors enables optimal heat extraction, making it possible to meet the highest efficiency requirements (efficiency classes IE3, IE4), while the motors also demonstrate very high power density. The motor is also equipped with a standard DataMatrix Code that is used to identify the motor. The electronic name plate can then be acquired with an app, allowing for access via smart device. Not least of all, the new severe-duty motor also represents a crucial step into the digital world: when it is equipped with Smart Motor Concept

in the future, the Simotics SD next generation will enable simple analysis of the motor's condition data via a cloud connection to MindSphere. This will let users obtain maximum transparency, which increases the productivity of the entire process. It also significantly increases uptime, improves performance, and optimizes serviceability.

The Simotics SD motors of the next generation are initially available in frame sizes 315 (160-kW to 315-kW power outputs) and 355 (250-kW to 500-kW power outputs). Thanks to their new terminal box concept, they can be customized for a wide variety of installation sites. Because the motor can be used both for mains-fed operation at fixed speed and for converter-fed operation at variable speed, only one version is necessary for a variety of applications.

NEW FEATURES

- Access to the digital world through cloud connection
- Unique design concept with high power density, compact sizes, flexible terminal box
- Future-oriented energy-efficiency concepts (efficiency requirements IE3, IE4, IES2)
- Higher planning security for users, thanks to short delivery time

Severe-duty motors with cast-iron housings are especially robust, which makes them the first choice for applications in more difficult ambient conditions including dust and vibration, or operation in aggressive environments. This is why the new Simotics SD motors are predestined for use in industries such as water and wastewater, steel, cement, mining, and the process industry. ■

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

N-Arpex all-steel coupling

Powerhouse starting up

N-Arpex, the new version of the Arpex all-steel coupling, is characterized by its enormous power density and the reduced version variety. It is possible to transmit up to 28,000 Nm with only one standard version, available in 14 sizes. This corresponds to a torque increase of between 70% and 100%.

The rigid, clearance-free, and flexible permanent N-Arpex is available in three-part and five-part versions. Thanks to its excellent concentricity, it is suitable for high rotational speeds. It is also optimally prepared for quick installation. In addition to the typical shaft distances of 100 mm to 250 mm, it is also possible to realize special sizes up to more than 6 m – project-specific and without long wait times.

The margin of the permitted operating conditions has also been improved. For example, the new N-Arpex has a greater angular misalignment (up to 1 degree instead of 0.7 degrees) as well as a greater axial offset. Lateral offset is no longer a problem either. The N-Arpex also scores with a wide temperature range from -50°C to $+280^{\circ}\text{C}$. The weight of the new coupling series has also been optimized. The machines that will be connected can benefit from this thanks to a reduced transition moment and even better dynamic behavior. Now it is possible to transmit even very high rotational speeds safely and smoothly. ■

➤ [siemens.com/couplings](https://www.siemens.com/couplings)

NEW FEATURES

- New design of the clutch packs
- Closed flange geometry
- Standard safety catch on the shaft sleeve
- FEM-optimized power distribution within the all-steel disk coupling
- Flexible and fast in-house sleeve production
- Functions such as increased bore capacity of the standard hubs and conformity with ATEX and API already integrated in the standard series



Link between the real and the digital world

OPC UA is an important standard on the path toward digitalization and has seen rapid growth in recent years. With the new V3 firmware version, the Simatic RF600 RFID system now supports this interface as well, enabling an easy connection to cloud systems.

There are many reasons for the boom of the OPC UA standard: Platform-independent, with the highest possible performance level and proven security mechanisms, it allows seamless communications with third-party applications and can be flexibly scaled as required. That is why Siemens also relies on this open interface, from sensors to the cloud.

Making data transparent

The new firmware enables devices to be connected to the cloud-based, open Internet of Things (IoT) operating system MindSphere – for example, via the industrial IoT gateway Ruggedcom RX1400 with MindConnect or with the cloud gateway MindConnect Nano. This introduces users to entirely new possibilities. Acting as a link between the real and the digital world, Simatic RF600 is the first RFID system to provide data in MindSphere. This means that containers, pallets, or products that are fitted with an RFID transponder can be recorded and tracked. By analyzing the data imported into MindSphere

through Simatic RF600, KPIs such as plant availability, utilization of assets, and energy-saving potential are made transparent, which permits the optimization of functions such as production processes and supply chains. The result is an increase in efficiency and quality of production, logistics, asset management, and other areas in all industries. Simatic RF600 and MindSphere are not only essential parts of the puzzle for digitalization, they are also an important basis for applications and data-based services from Siemens in the areas of predictive maintenance and energy data management, as well as asset and supply chain management.

Easy access online

The configuration of the Simatic RF600 reader can be performed very easily via web interface in a browser. The captured data can be analyzed and made available worldwide due to the web-based concept. ■

➤ [siemens.com/rf600](https://www.siemens.com/rf600)



Industrial Identification

Identification systems help companies remain competitive in increasingly dynamic markets. RFID or optical identification systems allow manufacturers to meet the ever-increasing demands relating to material flow control, asset management, tracking and tracing, and supply chain management.



Simatic RF300

Features for the future

NEW FEATURES

- Integrated setup wizard to determine the perfect antenna position, especially in metallic environments
- RGB-LED control lamps for visual diagnostics
- Simple expansion and migration from the Moby E plants and the Moby I legacy system
- Automatic identification of different transponder types
- Integration into the Simatic Step 7 engineering systems and TIA Portal

Modern design, significantly improved functionality, and an even wider range of applications are just some of the features of the new generation of Simatic RF300 readers. The three device types RF310R, RF340R, and RF350R offer high process reliability, reduced downtime, easier retooling and stock-keeping, a less complex system integration, and faster programming and commissioning. The three new readers are also fully compatible with the existing product family. The inductive Simatic RF300

RFID system has been designed specifically for use in industrial production to control and optimize the material flow. It is perfectly suited for simple as well as complex RFID applications and is characterized by a convincing price/performance ratio. With its compact component dimensions, it fits snugly into assembly lines, handling systems, and workpiece carrier systems in confined spaces. ■

➔ siemens.com/rf300

Simatic RF1000

Quick identification of operating staff

The Simatic RF1060R reader is a flexible and easy-to-use solution for machine and plant access control. It enables companies to use their existing employee ID cards to control access rights individually and thus identify the operating staff and document who accessed the machines, and when. This helps prevent unauthorized access and misuse, thereby ensuring process reliability and efficiency. The Simatic RF1060R is particularly well suited for automotive manufacturers and suppliers as well as companies in the pharmaceutical and food industries.

The Simatic RF1060R operates in the HF range, with a frequency of 13.56 MHz.

It supports the ISO 14443 A/B (MIFARE) and ISO 15693 standards. The reader has a USB interface (1.8 m cable with USB connector, type A) and can be integrated into software applications running on Windows 7, 8, and 10. It can also be easily integrated into Simatic Advanced HMI Panels. With its compact design, it is perfect for applications in confined spaces. Thanks to its high protection class (front: protection class IP65), it can withstand harsh industrial environments at temperatures of -25°C to +55°C. ■

➔ siemens.com/rf1000



HIGHLIGHTS

- Easy machine and plant access control
- Increased process reliability and efficiency
- Suitable for cross-sectoral use and harsh environments
- Easy integration into existing hardware (Advanced HMI Panels and extension units for the IP 65 HMI PROtected system)

Robust and flexible in harsh environments

The new Scalance W778-1 M12 Access Points and W738-1 M12 Client Modules are robust, compact, flexibly deployable, and can be perfectly integrated in the TIA environment.

With their high IP65 degree of protection, Scalance W778-1 M12 Access Points and Scalance W738-1 M12 Client Modules are especially suitable for applications without control cabinets. The robust aluminum enclosure withstands both high mechanical requirements, and strong temperature fluctuations. Each device is equipped with two N-Connect antenna sockets, two M12 Ethernet connections (10/100 Mbit/s, D-coded), and a redundant 24V-M12 socket for the power supply. Thanks to these permanently fixed connections, the devices are resistant to high levels of shock and vibration.

Equipped with the proven Scalance W firmware and the corresponding key plugs, the new Access Points and Client Modules feature some additional functions specifically for industrial applications. With 2 x 2:2 MIMO, they achieve data rates of up to 300 Mbit/s according to WLAN standard IEEE 802.11n and are suitable for frequencies of both 2.4 GHz and 5 GHz.

Flexibility thanks to compact design

The biggest advantage of the Scalance W778-1 M12 Access Points and W738-1 M12 Client Modules is that while they are quite robust, they are still compact and space-saving. This is underscored by the diversified mounting options: the new Access Points and Client Modules can be easily mounted with their corresponding mounting adapters, either flat or – for maximum saving of space – laterally on a mounting rail. Alternatively, they can also be mounted directly on the wall using screws.

Because all LEDs are placed on the edge of the enclosure, they can generally be seen from different angles. Users can also save cabling and mounting time by letting power and data flow through one line – by means of a Power-over-Ethernet (PoE) connection. This enables a cost-efficient and convenient use of the new products for different applications, such as for the wireless on-site networking of welding robots, power screwdriver controls in the automotive industry, and the connection of automated guided vehicle systems (AGVs) to a control system. ■

➤ [siemens.com/scalance-w730](https://www.siemens.com/scalance-w730)

➤ [siemens.com/scalance-w770](https://www.siemens.com/scalance-w770)

➤ [siemens.com/wireless-approvals](https://www.siemens.com/wireless-approvals)



Industrial Communication

From the simple connection of a sensor to the collection and transmission of all of a factory's quality and production data – the whole package for Industrial Communication facilitates the efficient integration of all company divisions.

Scalance W1750D

Highest data rates and centralized network management

The new, high-performance Direct Access Point for data rates up to 1,733 Mbit/s manages wireless networks with up to 64 access points. In accordance with the latest WLAN standard IEEE 802.11ac Wave 2, Scalance W1750D-2IA RJ45 transmits with eight omnidirectional antennas that are integrated in the device. It is especially suitable for wireless applications that require very high bandwidths, when video transmission is involved, or there are a large number of users in the network, for instance.

Thanks to the integrated virtual controller, Scalance W1750D-2IA RJ45 is able to manage WLAN networks with up to 64 access points directly with no need for separate hardware or licenses. Easily and individually scalable, Direct Access Points (1 to 64) can be added to the virtual controller network piece by piece to automatically provide the right configuration. Another cost-saving factor is the transmission of power and data through one line by means of a Power-over-Ethernet connection. Scalance W1750D-2IA RJ45 supports frequencies of both 5 GHz and 2.4 GHz.

Their flat, state-of-the-art design and their low weight make Direct Access Points ideal for assembly on ceilings or walls. Typical fields of application include prestigiously designed rooms as well as industrial environments with more moderate environmental conditions such as assembly halls and adjoining spaces. Scalance W1750D-2IA RJ45 is available in different variants for different countries. ■

➤ [siemens.com/scalance-w1750d](https://www.siemens.com/scalance-w1750d)

➤ [siemens.com/wireless-approvals](https://www.siemens.com/wireless-approvals)



NEW FEATURES

- Gigabit data rates thanks to WLAN standard IEEE 802.11ac Wave 2
- Integrated controller functionality for centralized network management
- Cost-efficient power and data transmission through a single cable
- Smart design for applications in moderate environments

Scalance XF204-2BA IRT

Precise data exchange

A cyclical and deterministic data exchange between PLCs and their periphery is essential for fast production processes. In order to optimize the efficiency of a production machine, Industrial Ethernet switches with special characteristics are therefore very much in demand. The new Scalance XF204-2BA IRT (isochronous real time) has a hardware architecture that allows members to exchange data quickly and precisely (synchronous).

Standard Ethernet users can also be linked to a Profinet IRT network with Scalance XF204-2BA IRT. The switch is specified according to Profinet

Conformance Class C (CCC) and supports "bumpless" redundancy for very high availability. In addition to their convenient mounting in the control cabinet, the modular switches in the Simatic ET 200SP's design also make it possible to use the Simatic ET 200SP bus adapter flexibly for different topologies. There are bus adapters with a copper or fiber cable interface available in RJ45, LC, POF, and mixed versions. The switches can be operated at temperatures ranging from -40°C to $+70^{\circ}\text{C}$, and they can even be used in hazardous locations. ■

➤ siemens.com/x-200irt



NEW FEATURES

- Fast and synchronous communications
- "Bumpless" media redundancy
- Profinet CCC certification

Scalance XF204-2BA DNA

IE switches for process automation



NEW FEATURES

- For enhanced environmental conditions (Conformal Coating)
- Integration of S2 devices in highly available R1 systems
- NAMUR/NE21 conform

The distributed control system Simatic PCS 7 V9.0 uses Profinet as far as the field level and is therefore perfectly prepared for digitalization. The Industrial Ethernet switches for the integration of Profinet field devices have to withstand enhanced environmental conditions in the process industry and they have to be capable of being integrated into highly available systems. The new Scalance XF204-2BA product range meets all the device requirements for process automation according to NAMUR/NE21.

With coated printed circuit boards (Conformal Coating) and a temperature range from -40°C to $+70^{\circ}\text{C}$, they are the optimal solution for distributed use in harsh environments.

Scalance XF204-2BA DNA also provides the Y-switch function, which connects S2 devices to a highly available R1 system. The devices can be easily mounted in the control cabinet next to the new Simatic ET 200SP HA. Thanks to the flexible bus adapter concept, the switches can be integrated into different network topologies: There are bus adapters with copper or fiber cable interface available in RJ45, LC, POF, and mixed versions. ■

➤ siemens.com/xf-200

Scalance XR-300WG

Highly flexible enclosure design

Digitalization can only be implemented in production facilities with structured networks: machines and systems have to be able to reliably exchange data with superior systems. The high level of data traffic requires high-performance switches on the aggregation level. The new Scalance XR-300WG (work-group switch) Industrial Ethernet switches with up to 28 Gigabit ports and firmware functionalities such as virtual LANs (VLAN) meet these requirements.

Redundancy mechanisms such as MRP are also providing high availability in the network thanks to fiber-optic cable transceivers to bridge even long distances. One great advantage of the new Scalance XR-300WG switches is their enclosure: their shallow mounting depth and modular design mean that two switches can be installed on both sides in a 19" rack control cabinet. Depending on the version, Scalance XR-300WG can be supplied with DC 24 V or AC 110-240 V. Approvals for use in hazardous locations and full Profinet and EtherNet/IP diagnostics support complete this product range. ■

NEW FEATURES

- Up to 28 full-Gigabit ports in copper and fiber-optic versions
- Compact 19" aluminum enclosure with shallow mounting depth
- Profinet and EtherNet/IP diagnostics support

➤ siemens.com/xr-300wg



Scalance TAP104

Easy data analysis

NEW FEATURES

- Exports all data telegrams
- Integration into networks without any fallbacks
- Devices still communicate even when the Scalance TAP has no power

Communications in industrial networks must be robust, reliable, and highly available. To avoid disruptions and breakdowns, it is essential to be able to determine that all data in the machines and systems are correct. The new Test Access Port Scalance TAP104 allows data telegrams to be exported in both directions so that all data traffic – correct and faulty – reaches diagnostic tools.

Scalance TAP104 is integrated by combining two devices such as a PLC and an Industrial Ethernet switch without compromising network communications. This operation without any fallbacks also works when the device has no power. The Test Access Port also features two robust copper ports with a data rate of 10/100 Mbit/s for the connection of the two devices and in addition, two TAP ports for data export. With a temperature range of -40°C to +70°C, the TAP is perfect for use in industrial environments as well as hazardous locations. In addition, it can be mounted next to a Simatic S7-1500 in the control cabinet. ■

➤ siemens.com/tap





NEW FEATURES

- Diagnostics of serial machines using network address translation (NAT)
- Advanced and optimized display of topology
- Operates without Java Runtime

Sinema Server V14

More convenient monitoring and data collection

The Sinema Server software for network management and diagnostics makes monitoring and data collection even more convenient. The new version V14 with network address translation (NAT) enables all diagnostic data from machines and systems to be collected, even if they have identical IP addresses. The advantage: serial machines can be analyzed in one single Sinema Server installation.

Sinema Server uses Java scripts to display topologies, so that Java Runtime installation is no longer necessary. This means that both installation and startup of the management and diagnostic software is clearly accelerated

on PC-based systems. Another innovation involves the IPv6 Basic support. Sinema Server V14 distinctly marks network devices with IPv6 IP addresses so that users have a comprehensive overview of all IPv4 and IPv6 devices in the system at any time. In addition to the OPC UA server functionality, there is now another way to send data to superior systems: the connection to MindSphere. For example, the new Ruggedcom RX1400 with MindConnect enables monitoring data to be sent directly into MindSphere. ■

➤ [siemens.com/sinema-server](https://www.siemens.com/sinema-server)

Sinema Remote Connect V1.3

Secured remote access made easy

A secured remote access to machines and systems is now even easier. The new version 1.3 of the management platform for remote networks, Sinema Remote Connect, now provides a multifactor authentication: in addition to authentication with user name and password, users can also log on with a PKI Smartcard. This new function applies to both web-based management of the Sinema Remote Connect server and the Sinema RC Client. The new version 1.3 also supports the current encryption process TLS 1.2 and therefore increases the security for remote access.

The new version of the management platform also enables offline licensing to activate user and device licenses on the server with no need for a connection to the Internet. In the new version 1.3, the Sinema RC Client supports Windows 10, so that devices with this operating system can now also access widespread machines and systems via Sinema Remote Connect. ■

➤ [siemens.com/sinema-remote-connect](https://www.siemens.com/sinema-remote-connect)

NEW FEATURES

- Multi-factor authentication for simple and secured login
- Current encryption process TLS 1.2
- Offline licensing and support of Windows 10 for greater flexibility



Simatic RTU3010C

More flexibility in the Telecontrol sector

The new remote terminal unit Simatic RTU3010C and new functions for Simatic RTU3030C extend the possibilities of compact RTUs for telecontrol applications. With these devices, measuring points for important process data such as level, flow rate, filling level, temperature, and pressure can be easily realized and monitored in plants that are distributed over a wide area. Process values are transmitted in a time- or event-controlled manner. The compact RTUs now also support the Sinaut ST7 telecontrol protocol, which means that they can also be perfectly integrated into existing and new Sinaut ST7 plants. Energy consumption is optimized by various modes of operation. The RTUs immediately report exceeding the threshold values to the service staff via SMS or email – even in sleep mode.

The new RTU3010C provides more flexibility in its connection to the control center via remote wireless connections or tethered IP-based networks such as DSL. Instead of an integrated “3G / UMTS” modem, it uses external industrial routers – such as Scalance M – to connect to its network via their Industrial Ethernet interface. Power is supplied over a DC 12-24V interface, a solar panel with accumulator or batteries, in any combination. Connected sensors can also be supplied with power by the RTU. The new firmware version V2.0 also supports the use of additional batteries. This increases the capacity to more than 70 Ah and thus ensures significantly longer uptime without a battery change.

The compact RTUs can be connected to any SCADA systems because they support different telecontrol protocols. Thanks to their rugged design they can be used in harsh conditions from –40°C to +70°C, and in an additional protective enclosure with an IP68 degree of protection, they will even withstand flooding. The RTUs can be configured with a standard web browser. Changes to the configuration or firmware updates can be performed at a distance. Because the new firmware version supports the Sinema RC auto configuration function, VPN connections to the RTUs can be configured with the management platform for Remote Networks, Sinema Remote Connect. The RTUs can be flexibly used in fields of application including water and sewage management, farming, and inventory monitoring. ■



NEW FEATURES

- Direct connection of sensor systems via integrated inputs/outputs
- Flexibility in the connection of various control centers via several telecontrol protocols, including standard protocols
- Flexible connection using a variety of private and public remote networks
- Easy set-up thanks to web-based configuration without any programming effort
- Easy connection to Sinema Remote Connect

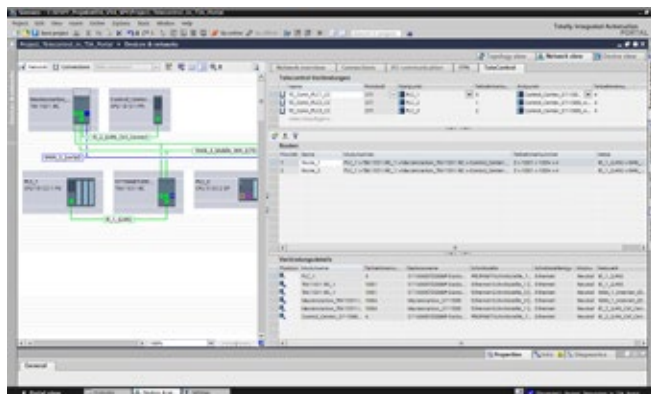
➤ siemens.com/compact-rtu

RTUs based on Simatic S7-1500 Advanced Controller

Telecontrol as an integral function in TIA Portal

Remote Terminal Units (RTUs) are a good way to monitor and control widespread automated plants and systems from a central control center. The new TIM 1531 IRC communication module enables the integration of Sinaut ST7 Telecontrol solutions directly in Step 7 Professional V14 SP1 (TIA Portal). The new Telecontrol Interface Module (TIM) extends the telecontrol product range using modular RTUs based on the Simatic S7-1500 Advanced Controller.

TIM 1531 IRC links external stations with a telecontrol control center via telecontrol protocol Sinaut ST7 and can also be used as master and node station. The RTUs use public or private networks (remote networks) to communicate. To enable connection to these networks, an external industrial router – such as Scalance M – can be connected to the Ethernet interface of the device. The TIM 1531 IRC provides three Industrial Ethernet interfaces and a serial interface to connect a modem. This means that various redundant transmission routes can be combined into one superior Sinaut ST7 master or node station, which increases availability.



The TIM features a processor and a RAM memory to buffer a maximum of 100,000 telegrams with time stamps. This avoids data loss in the event of a failure. As soon as the connection is restored, the values are transmitted to the control center in the historically correct sequence. The cyclical and event-controlled data transmission is complemented by an e-mail function to inform personnel about exceeded thresholds, for example, and provides extensive diagnostic functions.

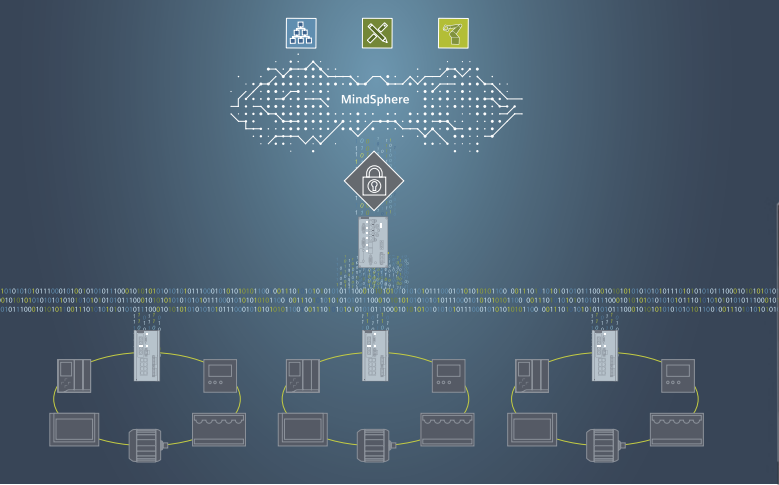
All functions of the TIMs are configured in TIA Portal Step 7 Professional V14 SP1 engineering software – as well as the proven Telecontrol components TIM 3V-IE (Advanced) and TIM 4R-IE for remote terminal units based on S7-300/400. Thanks to the option of "data point configuration" in TIA Portal, there is no further programming effort required for data transmission to the control center. The uniform "look and feel" of the telecontrol components for modular RTUs based on the Simatic Controller makes engineering very efficient. ■

➤ www.siemens.com/telecontrol

NEW FEATURES

- Extension of existing telecontrol systems using S7-1500 stations and utilization as master or node station
- Media redundancy provides higher availability if the primary connection fails
- Central and simple engineering of remote networks saves time and money





Ruggedcom RX1400 with MindSphere connectivity

Direct connectivity to MindSphere

The Ruggedcom RX1400 with VPE1400 functionality is a compact cellular router, which combines Ethernet switching, Wireless LAN, routing, a virtual machine environment, and firewall along with various long-range connectivity options, such as Gigabit fiber optics. The Ruggedcom VPE1400 enables applications to run in a virtual environment that has full access to the network, wireless LAN, and serial and LTE interfaces on the RX1400.

The Industrial IoT Gateway Ruggedcom RX1400 with MindConnect running in the VPE1400 is a plug-and-play solution that enables users to read data with OPC UA or an S7-connection from their assets and preprocess them for transfer to MindSphere – simply and reliably. The encrypted data is transferred securely to MindSphere where it is available for further processing and analysis.

Ruggedcom RX1400 with MindConnect integrates data acquisition, conversion, and communication into MindSphere in a compact, single device solution. End devices can be connected via serial, wireless LAN, and Ethernet connections. The connection to MindSphere can be set up with redundant paths via either LTE or copper/fiber Ethernet. Proven reliability and ability to function in extreme temperatures and harsh environments make the Ruggedcom RX1400 with MindConnect the obvious choice for MindSphere data acquisition in industrial applications such as electric power, transportation, as well as oil and gas. ■

➤ siemens.com/rx1400

➤ siemens.com/mindsphere



NEW FEATURES

- Plug and play Industrial IoT Gateway for data transfer to MindSphere
- Preprocessing of data before transferring to MindSphere
- Proven reliability in extreme temperatures and harsh environments
- High bandwidth connectivity to remote locations

Ruggedcom RX1500 LTE Line Module

WAN access worldwide

Siemens is expanding its Ruggedcom portfolio for industrial communication. The company is now offering a line module, which supports LTE (Long Term Evolution) for its Ruggedcom RX1500 product family.

RX1500 and RX1501 are suitable for rack mounting and the Ruggedcom RX1510, RX1511 and RX1512 are compact form factors suitable for installation in cabinets or other non-rack mount applications.

This product family of cost-efficient industrial-grade Layer 2 and Layer 3 switches and routers is designed to comply with protection rating IP30. It requires no fans for cooling, and it is capable of operating at ambient temperatures of between -40°C and $+85^{\circ}\text{C}$. In addition, it is highly resistant to electromagnetic interference and current fluctuations. The family comprises different form factors with metal housing. The Ruggedcom

With the new LTE Line Module all form factors can have cellular 4G connectivity added to them. This can be done to existing devices in the field as well as in new deployments. The addition enables users worldwide to connect to the latest wireless wide area networks. This product is ideally suited for electric power utilities, the industrial plant floor, rail, and traffic control systems. ■

➤ siemens.com/rx1500



NEW FEATURES

- With the new LTE Line Module all products from the RX1500 family can have cellular 4G connectivity
- The LTE Line Module enables users world-wide to connect to the latest wireless wide area networks
- More connectivity options provide more flexibility to customers using Ruggedcom products in harsh, often remote locations

Ruggedcom RSL910

Reducing cabling costs

HIGHLIGHTS

- Rugged layer 2 switch with two EoVDSL2 uplinks
- Use of existing copper cabling infrastructure to reduce cabling costs
- Suitable for use in transportation applications, such as intelligent transportation systems (ITS)

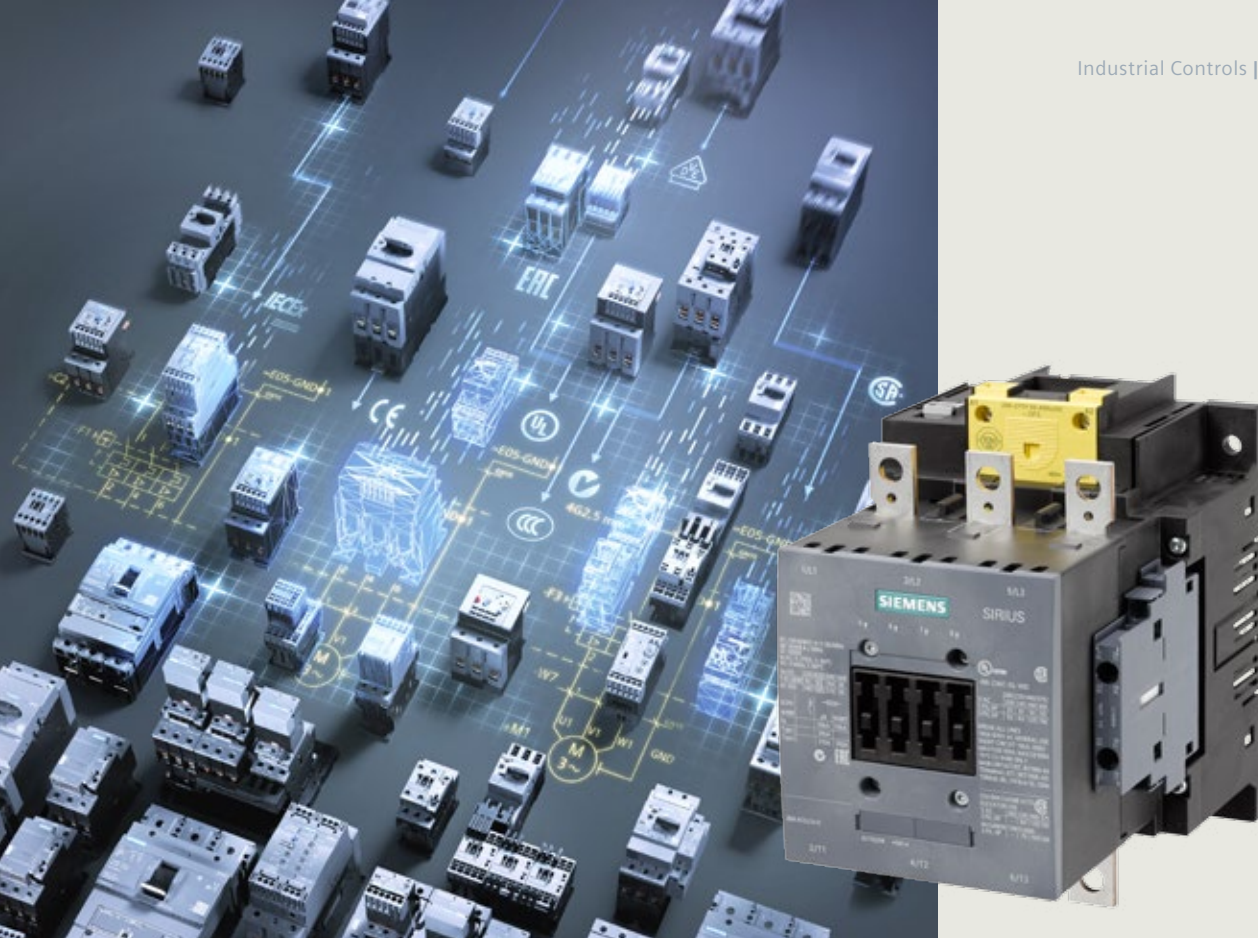


Siemens has extended its portfolio of rugged network components with the Ruggedcom RSL910. The compact Ethernet switch is designed to operate in harsh environments with widely varying climatic and environmental conditions. Withstanding extreme temperatures from -40°C up to $+85^{\circ}\text{C}$, vibration, and shock and thereby offering high reliability, this device is especially suitable for transportation applications such as rail and ITS (intelligent transportation systems).

The RSL910 helps meet the growing demand for Ethernet in roadside and wayside cabinets by eliminating the need for multiple switches. Customers can reduce cabling costs by reusing existing two-wire copper cabling. The two Gigabit SFP (small form factor pluggable) and the two EoVDSL2 (Ethernet over VDSL2) uplinks offer a migration path to fiber optics when required. The six copper Fast Ethernet interfaces allows users to connect multiple end devices directly to the RSL910 without the need for additional network equipment.

The small form factor of the Ruggedcom RSL910 makes it easy to deploy in space-limited cabinets, and it can also be mounted directly on a DIN rail. To further simplify installation in existing cabinets, the switch supports multiple AC-and DC-voltage input ranges. ■

➤ [siemens.com/rsl910](https://www.siemens.com/rsl910)



Sirius modular system

Safety solution for contactors

Sirius fills out its lineup – the new devices in the contactor family come in different sizes and variants. Thanks to the TÜV-certified control signal input, they even meet the highest safety standards.

Siemens is expanding its established Sirius contactor portfolio in the sizes S6 to S12, which have an output of 55 to 250 kW (AC-3, 400 V), with variants for the control from fail-safe control systems.

Highest safety level

These are the first contactors to choose for high-performance devices and are available with an input for fail-safe signals. They can therefore be used up to the highest safety level (SIL CL 3) when used as a pair (one contactor alone fulfills level SIL CL 2). The advantage of the new products lies in the elimination of additional, positively-driven coupling relays and

the simplified evaluation of the safety chain, because until now, large contactors could not be directly connected to semiconductor outputs. The control can now be conducted directly – from pm and pp switching, fail-safe or standard semiconductor outputs, and classical relay outputs. This means that the time required for wiring and project planning is reduced.

In addition to the standard configuration with exchangeable side-mounted auxiliary switches, there are variants with nondetachable side-mounted auxiliary switches. This meets the requirements of SUVA, the Swiss accident insurance institute.

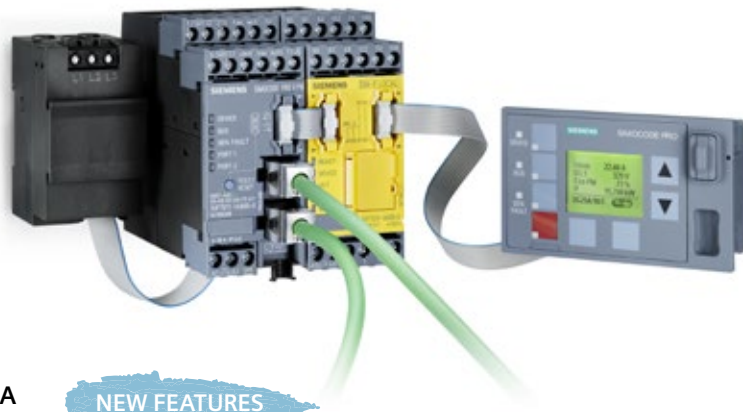
Planning made easy with Sirius

The Sirius modular system is a key element in control cabinets and in all safety applications. Making all planning and engineering data available in digital form (CAX data) supports and simplifies the digital control cabinet planning process. Siemens' comprehensive range of devices for control cabinets provides skillful and efficient support with products, systems, and solution expertise for all process steps. ■

➔ siemens.com/sirius-modular-system

Industrial Controls

Whether the task involves switching, protecting, starting, or monitoring, with the Sirius modular system, Siemens offers a coordinated portfolio for industrial controls that is easy to install in the control cabinet and straightforward in its integration into distributed systems.



Motor management system Simocode pro with OPC UA

Data stream from the switchboard

Thanks to the interface for the communication standard OPC UA (unified architecture) integrated in Simocode pro, all operation, service, and diagnostic data from the motor management system can be purposefully evaluated and used for plant optimization – without engaging the process control. The data stream is sent directly from the switchboard to the central data processing site via Ethernet: for example, to a MES, ERP, or the cloud-based, open IoT operating system MindSphere. The Ethernet-based OPC UA communication standard based on TCP/IP provides anti-fraud protection (security). Simocode pro therefore

NEW FEATURES

- Direct, fast evaluation of data from the switchboard with no complex project planning
- Motor data for comprehensive process monitoring available in the cloud or locally
- Prompt data delivery allows preventive maintenance and quick access in the event of failure

ensures smooth production processes and enhanced process operations – with absolutely no complex project planning! Equipped with teleservice, network integration, and web capacity, the motor management system completely ensures that switchboards and MCCs support the process industry as valuable data providers. ■

➤ siemens.com/simocode

Motor management system Simocode pro for EtherNet/IP

New language, time-proven function

The motor management system Simocode pro now speaks EtherNet/IP. This means that its communications options are expanded and it can be used more flexibly and extensively. EtherNet/IP is an open industrial Ethernet protocol; its standard is driven by ODVA (Open DeviceNet Vendor Association). With this option, more new fields of applications in

addition to Profibus, Profinet, and the newly launched Modbus communications are now possible.

All known functions and displays for motor control and monitoring are available for this purpose: for example, the integrated web server to diagnose and analyze measurement values, support redundancy mechanisms,

and enable parameterization via Simocode ES V14. ■

➤ siemens.com/simocode

NEW FEATURES

- Full motor monitoring and control
- Two communications ports with an integrated switch
- Supports redundancy mechanisms
- Integrated web server to diagnose and analyze measurement values
- Additional Ethernet-based services such as NTP (network time protocol)



Current / voltage measuring in the motor management system Simocode pro

Precise sensor for motor data



NEW FEATURES

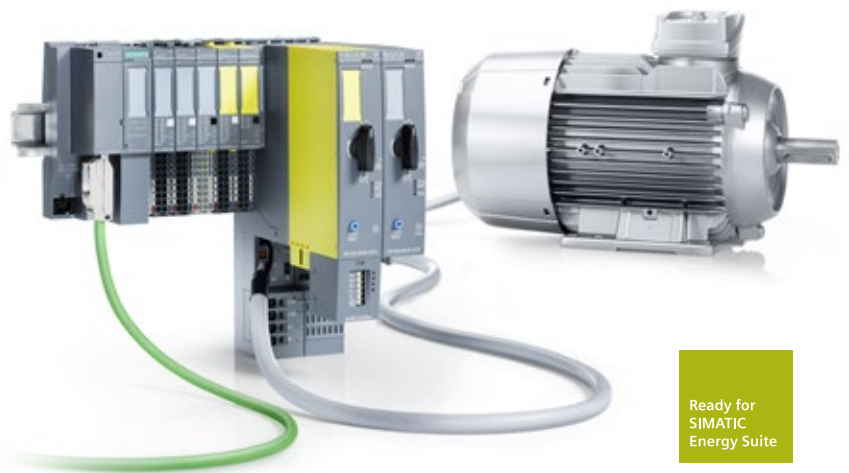
- Enhanced measurement accuracy for all values
- Higher performance during measured value recording
- Frequency recording as a new measuring value
- Internal earth-fault monitoring with adjustable warning and tripping threshold
- Shallow device depth in current ranges of up to 115 A

To present energy consumption in a transparent way, users want to use existing data delivery devices. The motor management system Simocode pro now supports this requirement with innovative current/voltage measuring modules for the device series Simocode pro V. With the new modules, it is now possible to measure current, voltage, power, and frequency with high accuracy. At the same time, the modules have a very broad measurement range in the variants of up to 115 A. All data and measurement values are also available in TIA Portal, thanks to the supporting software Simocode ES V14. The data are collated and transferred to higher-level process control systems or to MindSphere, for example, via Simocode pro V Profinet with OPC UA. ■

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

ET 200SP motor starter in Simatic Energy Suite

Transparent energy flow



Ready for
SIMATIC
Energy Suite

The new Simatic ET 200SP motor starters are available in standard and fail-safe versions. They switch and protect electrical loads up to 5.5 kW in logistics systems, production machines, and machine tools.

In addition, they provide comprehensive measurement and diagnostic functions. The current values can be transmitted and used for energy management functions. With Simatic Energy Suite, Simatic ET 200SP, M200D can be easily integrated into TIA Portal

and connected to higher-level energy management systems as well as cloud-based services. The linking of energy management and automation brings greater transparency to the production process. The project planning phases for energy recording are reduced to a minimum, and faults are detected at an early stage thanks to communication via Profinet. ■

➔ [siemens.com/et200sp-motorstarter](https://www.siemens.com/et200sp-motorstarter)

➔ [siemens.com/energysuite](https://www.siemens.com/energysuite)

NEW FEATURES

- Transparency thanks to the combination of energy and production data
- Consistency from data recording to energy management
- Simple integration of measuring points and comprehensive systems
- Switch and protection device for single-phase AC and three-phase asynchronous motors
- Fail-safe disconnection in the motor starter up to SIL 3 / PL e

Electrification goes MindSphere

Electrical power distribution in the Internet of Things

If electrical power distribution is integrated in industrial automation, all engineering processes can be implemented in a single tool. Relevant energy data are available centrally. The cloud-based, open IoT operating system MindSphere opens up additional potential for comprehensive energy-efficiency concepts.

To adequately support dynamic, networked production environments, hardware and software must interact smoothly with systematic data management. This also applies to the electrical power distribution in digital factories, which can be incorporated in the industrial automation environment by multiple integration. This includes the provision of all relevant data for automated engineering processes as well as the integration of communications-capable equipment and software in industrial automation via open interfaces. Communications-capable components, systems, and software can capture energy data and incorporate them into integrated energy-efficiency concepts – all the way to their connection to MindSphere.

Engineering in TIA Portal

The 3VA molded-case circuit breakers and measuring instruments in the Sentron portfolio's 7KM PAC series are integrated in TIA Portal V14, making electrification an integral part of automation. Standardized interfaces ensure the efficient interaction of all components in the industrial communications network. Using TIA Portal, they can be directly programmed and put into operation. The engineering is performed using a single tool that is used to intuitively configure the power distribution. Condition monitoring and gathering energy diagnostic data is also problem-free.

MindSphere for specific evaluations

Using MindConnect elements, you can also provide all energy data in MindSphere. This allows them to be made available for specific evaluations via the open cloud platform. Users can assess the state of the system and the quality of the network and also optimize energy consumption and utilization. For example, the energy consumption per day, shift, line, and production unit is determined as a basis for energy efficiency measures. The evaluation of energy consumption during production periods compared with non-production periods, for example, points the way toward energy-saving potentials.



Comparisons with other plants of procedures and processes in a single factory or across many locations will reveal additional potential. Precisely and reliably determining measured values for electricity, voltage, capacity, and power lays the foundation for systematic energy and plant monitoring. This creates enormous savings opportunities for companies and enables a sustainable energy management solution for the digital age. ■

➤ [siemens.com/lowvoltage/tia-portal](https://www.siemens.com/lowvoltage/tia-portal)

Totally Integrated Power

In industrial plants or buildings, power outages can have costly consequences. The comprehensive power supply portfolio from Siemens makes a reliable, safe, and efficient power supply possible with software and hardware products, systems, and solutions for all voltage levels.

7KM PAC measuring instruments

Power monitoring made easy

The Sentron portfolio's 7KM PAC measuring instruments make the status of plants and consumption values transparent. They record the energy values for supply, outgoing electrical feeds, and individual loads and deliver comprehensive information on electrical power distribution as well as important measured values for evaluating the status of the plant and network quality in a precise, reproducible, and reliable way. Now this portfolio is being supplemented by the 7KM PAC3200T and 7KM PAC2200 measuring instruments for a simple, affordable entry into power monitoring, and by the I(N), I(Diff), Analog expansion module for additional functions.

The compact 7KM PAC3200T measuring instruments are easy to clip onto a standard mounting rail and are perfect wherever no display is needed on a measuring instrument. The 7KM PAC2200 measuring instruments are just as easy to use. The versatile energy meters show the most important measured values directly on the display. Using integrated communication interfaces, they can be

integrated in power monitoring systems via Modbus TCP, Modbus RTU, or M-Bus. Both measuring instruments have an integrated web server with which the data can be visualized independent of the device. The measuring instruments are integrated into the powerconfig configuration software and the powermanager power monitoring software. They meet the requirements of IEC61557-12 with Class 1%, and international certifications mean that they can be used worldwide.

With the 7KM PAC I(N), I(Diff), Analog expansion module, the 7KM PAC measuring instruments can be expanded with more functions. This includes the measurement of the neutral conductor (IN) Class 1 according to IEC61557-12 and residual current type A or B. The module also offers two analog inputs: for example, for measuring residual current (IDiff), temperature, flow rate, and pressure. ■

➤ siemens.com/energymonitoring

NEW FEATURES

- Easy, affordable entry into operational power monitoring
- Compact measuring instruments for standard mounting rails
- Incorporation into power monitoring systems through integrated communication interfaces
- Expansion module for additional measurement functions



Sivacon S8 low-voltage switchboard

Safe distribution, intelligent management



NEW FEATURES

- Simaris control – the digital twin of the Sivacon S8 switchboard
- Increased protection against internal arcing for a high level of personnel and switchboard safety
- Higher ratings through energy-efficient cooling for reliable operation
- Optimal use of space with 300 mm-high small withdrawable units
- Powerful motor management systems for high flexibility and reliability

The Sivacon S8 low-voltage switchboard is ready for the challenges of the future – and of digitalization. Using the Simaris control visualization software, users can operate and monitor as well as parameterize communication-capable switching devices and motor loads on-site. The Sivacon S8 data are available for high-level automation and energy management systems or for cloud-based analysis systems. With its modular design and special features such as the active protection system against internal arcing and powerful motor management systems, the switchboard is very reliable, safe, and flexible.

Sivacon S8 has many intelligent switching devices that can be operated and monitored via Simaris control. Status information and measurement data are presented clearly, creating high transparency all the way to the individual feeders. Detailed warnings and fault signals allow for fast diagnosis of fault causes. Statistics data helps optimize and plan maintenance. Sensor data such as temperature values are also visualized in order to reduce downtime. The plant's energy requirements can be analyzed and optimized using the consumption values of the feeders. Changes to the switchboard can also be recreated on the digital twin. Using the integrated interfaces, the Simaris control hard-

ware can be connected to higher-level automation or energy management systems as well as cloud-based operating systems such as MindSphere in order to plan for processes such as maintenance strategies throughout the entire company.

Sivacon S8 stands for safety at a high level. The design verification of power switchgear and controlgear assembly is proven in accordance with IEC 61439-2. The verification with testing under arcing conditions in accordance with IEC/TR 61641 also ensures personnel safety. The active protection system against internal arcing of Sivacon S8 detects and quenches an arc fault quickly and reliably. The patented forced cooling technology reduces the derating, and the low temperature profile inside an MCC ensures the safe and long-term operation of sensitive electronic equipment.

Sivacon S8 offers solutions for all requirements. Different mounting designs can be combined in one cubicle with ease. The flexible modules allow for the simple exchange or addition of functional units. ■

➤ [siemens.com/sivacon-S8](https://www.siemens.com/sivacon-S8)

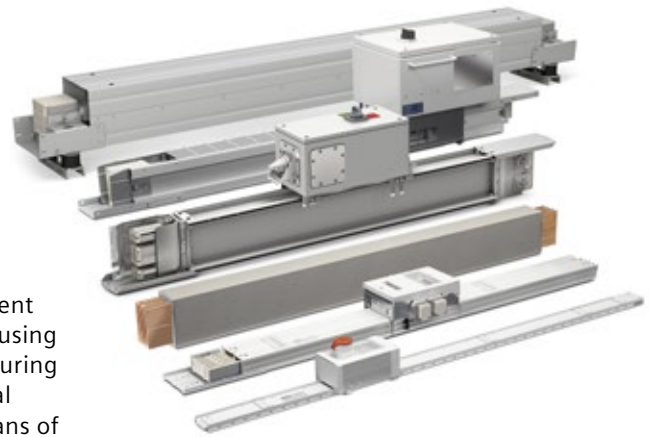
Sivacon 8PS busbar trunking systems

Innovative alternative to cables

Whether it is for an infrastructure or an industrial application, the Sivacon 8PS busbar trunking systems are an alternative to cables that is superior both technologically and economically. They are highly flexible both during the planning process and in operation. Their compact design enables fast installation compared with cables, saves space, and – with the Simaris sketch software tool – it is easy to create three-dimensional line routing plans for the busbar trunking systems. BIM (building information modeling) data are available for a consistent database. The digital twin of the power distribution system therefore integrates into extensive constructions – for efficient planning, implementation, and maintenance.

It is easy to plan and implement plant extensions or changes using the Simaris planning tools. During operation, outgoing electrical feeders can be varied by means of flexible-use tap-off units. In order to generate the data required for efficient energy management, communication-capable measuring and switching devices can be integrated in these tap-off units. In addition, the decentralized installation with switching devices close to the consumers makes the operation more transparent, and faults are easier to eliminate. ■

➔ [siemens.com/busbars](https://www.siemens.com/busbars)



NEW FEATURES

- High flexibility in the planning process and in operation
- Space-saving due to compact design
- Fast, easy, and safe installation
- Energy transparency thanks to communication-capable measuring and switching devices
- Greater plant and operating safety
- Support from building information modeling (BIM)



NEW FEATURES

- Risk mitigation and resilience with Pretact
- Digital monitoring
- State-of-the-art features for operation in urban areas
- Pioneering visual design reflects innovation

Innovative Transformers

Shaping the future of transformers

Transformers are crucial parts of energy grids everywhere around the globe. Depending on their reliability, operators need to ensure that their units work without fail at all times. Digitalization enables utilities and industrial transformer operators to monitor all parameters such as temperatures, voltages, and so on that might influence the transformer or their network. Web interfaces allow the operators to keep an eye on the status of their transformers at all times.

This new development – along with innovative modules of the Pretact

concept that are dedicated to enhance resilient operation, voltage stability and/or features that provide the best solution for operation in urban areas – catapults transformers into a completely new age. This is reflected in the progressive industrial design of Siemens Transformers. The complete portfolio was redesigned to transport the new image of the transformer itself and reflects the core values of Siemens Transformers: reliability, quality leadership and innovative capability. ■

➔ [siemens.com/transformers](https://www.siemens.com/transformers)

Gas-insulated medium-voltage switchgear type NXPLUS C

Even more areas of application

The NXPLUS C – a proven gas-insulated, medium-voltage switchgear with more than 90,000 panels in 106 countries – can now be used even more flexibly. New in the portfolio of this safe-to-operate multi-tool for every industry are a circuit-breaker panel in a slim design, a new, air-insulated metering panel, and an auxiliary transformer panel.

The new slim circuit-breaker panel with a panel width of 450 mm (up to 24 kV, 25 kA, 1 s, 3 s) makes both small feeders and compact incomers possible thanks to rated normal currents of 630 A and 800 A. The panel's design is based on a proven construction principle: a hermetically welded switchgear vessel combined with a new generation of vacuum circuit-breakers. The single-pole, solid-insulated busbars and the

single-pole insulated cable connection technology ensure compatibility with the previous NXPLUS C product range.

The air-insulated metering panel (up to 24 kV, 25 kA, 1 s, 3 s) allows operators to set up utility billing metering as the transfer station up to 1,250 A using standard block-type current and block-type voltage transformers. These can also be provided by the customer. In this process, the block-type transformers are preassembled on a cassette in the transformer room and arranged according to the customer's wishes for billing metering by either current or voltage. A capacitive voltage indication and fixed earthing studs optionally available meet all requirements for personal safety. In addition, the air-insulated metering panel was successfully type-tested concerning internal arc classification

according to IEC 62271-200 with IAC A FLR 25 kA 1 s.

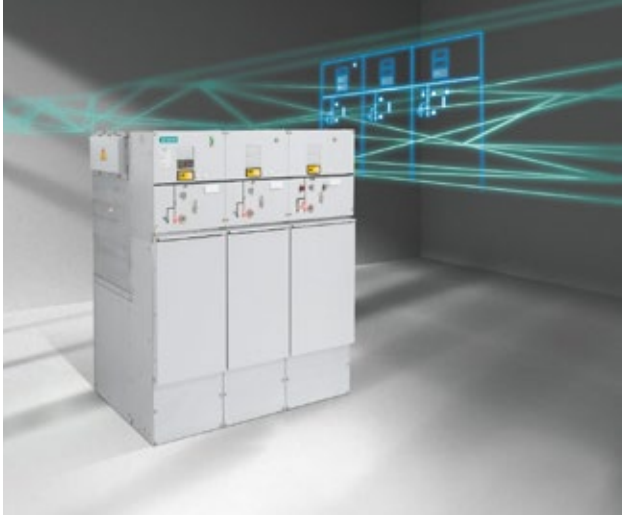
With a three-phase dry-type transformer (40 kVA) installed in the panel, the auxiliary transformer panel (up to 24 kV, 25 kA and 15 kV, 31.5 kA) ensures the power supply of a substation when no external auxiliary power supply exists. Switching and protecting the dry-type transformer with a design according to the Ecodesign Directive number 548/2014 of the European Parliament and of the Council is managed by a new generation of the switch-disconnector fuse combination. The transformer can be supplied via the busbar or alternatively via a lateral cable connection. ■

➔ siemens.com/nxplusc

NEW FEATURES

- Flexible: the right solution for every requirement
- Space-saving: minimum space requirements thanks to compact design
- Safe: investment protection through optional integration into intelligent grids
- Economical: climate-independent, durable, and maintenance-free switchgear





8DJH 36 gas-insulated medium-voltage switchgear

Additional substation not necessary

With the new outdoor enclosure, the 8DJH 36 gas-insulated medium-voltage switchgear can now be installed in wind farms, solar farms, and similar applications with no need for an additional substation. The switchgear's outdoor enclosure for applications up to 36 kV and 630 A has been tested for resistance to internal faults, is available in several heights and widths, and has a degree of protection of IP54.

The compact design of the 8DJH 36 also makes it possible to effectively use existing switchgear rooms. Thanks to the optional communication with the control room, the switchgear is optimally ready for digitalization. More than 30 years of experience with gas-insulated medium-voltage switchgear and a total of more than 1,000,000 delivered feeders since 1982 guarantee high quality standards and a maximum degree of personal safety. The switchgear is available both as an individual panel and as a block-type version. Whether it will be used in industrial operations or power distribution, the 8DJH 36 is designed for every application. ■

➤ [siemens.com/8DJH36](https://www.siemens.com/8DJH36)

NEW FEATURES

- Versatile thanks to outdoor enclosure, because no additional substation is necessary
- Internal arc tested design for high personal safety
- High reliability due to reduced downtimes
- Low operational costs due to maintenance-free design
- Worldwide use possible thanks to climatic independence

Sicam Q200 multifunctional recorder

Ensuring supply quality

Insufficient quality of the electrical power supply is one of the most frequent reasons of unplanned downtime and device damage. With the new Sicam Q200 multifunctional recorder, a Class A PQ device according to IEC 62586 -1/2 and IEC 61000-4-30 Ed.3, operators can identify weak points in time.

Sicam Q200 is a grid analyzer that registers and evaluates grid quality in power networks with extremely high precision and offers special algorithms and functions for energy management applications. Using the analysis results from the device, measures can be defined and implemented to ensure the supply quality. This increases the service life of the equipment and reduces downtime. The Sicam Q200 is suited for use in both single-phase systems and three-wire and four-wire systems at power supply companies, industries, data centers, and in trade. ■

➤ [siemens.com/sicam-q200](https://www.siemens.com/sicam-q200)

NEW FEATURES

- Save time and costs through early identification of problems in the supply quality
- High investment security by using standards for measuring methods, interfaces, and protocols
- Wide range of application areas thanks to high accuracy of measurement and a broad measuring range for high-frequency interference (2 to 150 kHz and transients at 1 MHz)
- Can be used in conjunction with high-frequency transformers/sensors in medium-voltage switchgear such as Siemens 8DJH



8VN1 blue GIS/3AV1 blue circuit-breakers

Climate-neutral alternative

The high-voltage portfolio has been expanded with open-air circuit breakers and gas-insulated switchgear (GIS) with vacuum switching technology up to 145 kV. The new 3AV1 open-air circuit breaker and the new 8VN1 Blue GIS switchgear are advancements of the switches and switchgear that work with sulfur hexafluoride (SF₆) as the insulating, switching, and extinguishing gas. With the combination of vacuum switching technology for switching and for extinguishing arc flashes and Clean Air as the high-voltage insulating medium, Siemens has enhanced the existing insulation and extinguishing methods in accordance with all requirements for climate neutrality – and it now offers customers an alternative solution without SF₆ that is also suitable for higher voltage levels. Thanks to the vacuum switching technology,

it is possible to eliminate technical insulating gases that also extinguish in part or even entirely. This contributes to a significant reduction in CO₂ emissions, because the global warming potential (GWP) of Clean Air is zero. Additional advantages for the operator are easier transport, installation, maintenance, and recycling.

This environmentally friendly vacuum switching technology – proven for more than 40 years in medium-voltage plants and high-voltage circuit breakers up to 72.5 kV – can now be used up to a rated voltage of 145 kV, a rated short-circuit breaking current of up to 40 kA, a rated current of 3,150 A, and operating temperatures of –60°C to +55°C without losing efficiency in the energy transfer. ■

➤ [siemens.com/energy-management](https://www.siemens.com/energy-management)



NEW FEATURES

- Climate-neutral vacuum switching technology also suitable for high-voltage switchgear up to 145 kV
- Carbon-neutral, because the global warming potential (GWP) of Clean Air is zero
- Reduced or even no use of technical insulating gases
- Easier handling during transport, installation, operation, maintenance, and recycling
- No obligation to report used gas volumes due to use of non-toxic Clean Air

Grid-connected power conversion systems

Comprehensive portfolio for grid integration of renewables

The growing share of weather-dependent renewables and distributed generation requires innovative, intelligent infrastructure and storage solutions. Comprehensive concepts and tailor-made products and systems make grids with fluctuating energy generation and changing power loads more sustainable, more secure, and more stable. Siemens offers comprehensive solutions for modern grids, from electrical Balance of Plant (eBoP), the energy storage solutions Siestorage, and converter systems for hybrid photovoltaic and storage plants for solar parks to complete microgrids. The complete design, engineering, financing, the electrical devices, and commissioning of a photovoltaic plant – from the Combiner Box with up to a 1,500 V DC connection to the inverter station including inverter, transformer, switchgear, and the connection to medium- and high-voltage grids – come from a single source. In addition, SCADA systems are frequently combined with a Sicam Microgrid Controller.

With the high-performance Sinacon HC hybrid converter, it is easy to connect various energy sources to the grid. The converter is equally suitable for applications in public and island grids, such as microgrids, and also feature different DC and AC power ports that can be controlled independently from each other. Due to the broad DC voltage range of 100 to 1,150 V DC of the hybrid converter Sinacon HC, every battery voltage range can be used independent of the AC voltage. This helps stabilize grids and enables the maximum output of the solar park to be tapped. The optimized grid filter concept with energy hysteresis regulation ensures an excellent quality of the energy supply. Because it is certified for local grid standards such as BDEW, UL1741, and TAB HV, the Sinacon HC fulfills all requirements for supplying



energy to medium-voltage grids. The proven and type-tested ready-to-connect cabinet system guarantees high performance and reliability. All of these properties make the modular, easy-to-operate, and flexible converter an all-around solution that helps increase efficiency in innovative, distributed grids. ■

➔ siemens.com/sinacon

➔ siemens.com/gridpowerconversion

NEW FEATURES

- Comprehensive portfolio for medium and low voltage, including the Sinacon HC converter for hybrid photovoltaic and energy storage applications, and SCADA and Sicam Microgrid Controllers
- Easy connection of a variety of energy sources to the grid
- Seamlessly integrated photovoltaic solutions from analysis to service, including financing
- Battery energy-storage system Siestorage for optimized grid operation
- Connection to medium-voltage distribution and high-voltage transmission grids



High-power charging systems for electric vehicles

Fit for a future with e-mobility

A new high-power charging system allows you to recharge electric vehicles quickly and reliably for long driving ranges. The individual charging stations have charging capacities of up to 50, 75, 150, and even 350 kW. For example, the station with a charging capacity up to 150 kW allows you to charge an electric range of 100 km in less than 10 minutes; the station with a charging capacity up to 350 kW can give you as much as 400 km in ten minutes. With voltage levels up to 1,000 V, the stations are also prepared for next-generation electric vehicles with greater electric ranges and higher voltage levels.

Depending on the configuration, several vehicles can be charged simultaneously with high output capacities. In order to be able to charge all types of ecars, Siemens is betting on standardization. The charging stations support all relevant charging standards such as CCS, CHAdeMO (both DC), and type 2 (AC). The integrated industrial components Sinamics DCP converter and Simatic S7 ensure the maximum availability and reliability of the charging system and are low-maintenance. The ECC3200 charge controller in industrial design permits the connection of downstream charge management systems from operators and ensures a maximum of both data and IT security.

Remote access to the charging stations via Sinema Remote Connect makes fast and cost-effective service possible through data analysis, shorter response times, and preventive maintenance.

Siemens is a strong partner in the entire e-mobility value-added chain. Customers receive advice on the implementation of complete systems – starting with the integration of the charging infrastructure into the existing topology of the distribution network all the way to integration into existing network management systems.

In addition to the high-power charging systems for electric vehicles, the Siemens solutions portfolio also offers AC charging systems for the public and semi-public sectors, including a solution for operating the charging infrastructure. The range of products also provides the mains connection, including the delivery of the required network connection systems and storage solutions for load management.

With the involvement of an international team, Siemens also offers the services required to reliably operate a charging infrastructure system. ■

➤ [siemens.com/charger](https://www.siemens.com/charger)

NEW FEATURES

- Fast high-power charging systems for electric vehicles
- Ready-to-charge existing and future ecars with greater ranges and higher voltage levels
- Supports all commonly used charging standards
- Integrates industry components for maximum availability
- Fast service and preventive maintenance thanks to remote access
- Comprehensive portfolio of complete solutions for charging infrastructure, including medium-voltage systems for mains connection, energy storage, and control and instrumentation technology

Industry Services

Siemens offers a broad range of product-, system-, and application-related services throughout the full lifecycle of machinery and plants – from planning to modernization.

Remote Systems as Managed Appliance

IT infrastructure with all-round service

In addition to servicing the hardware platform, the crucial factor in the reduction of lifecycle costs is the preventive maintenance of the installed software components. Remote Systems as Managed Appliance includes the complete virtualized server IT infrastructure and comprehensive services, as well as technical support for the automation and drives systems – all from a single source. This service combines the advantages of a virtual IT environment based on the Simatic Virtualization as a Service,

'Managed Support Services' and Simatic Remote Services. This way, users gain a complete all-in-one solution for their own remote services – directly on site, as their own "private cloud".

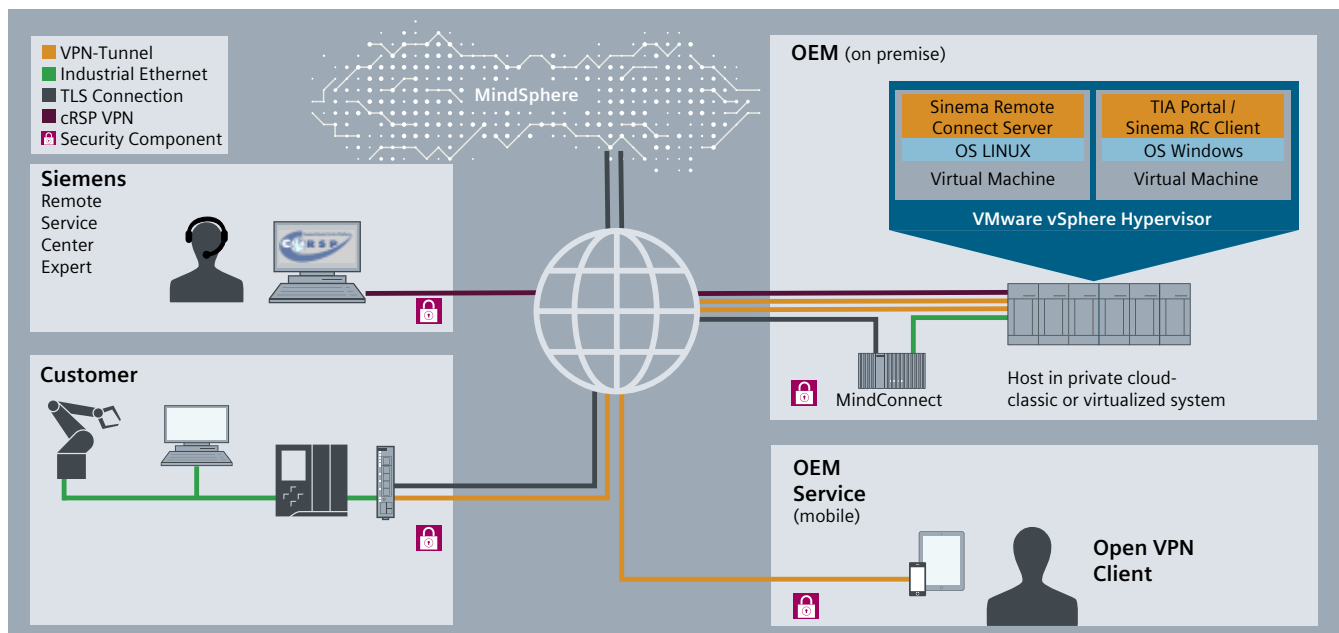
Using Simatic Virtualization as a Service allows the parallel use of a variety of applications on a shared hardware platform. Managed Support Services bundles and coordinates all support activities involving the virtual host system, thus providing optimal technical support.

NEW FEATURES

- Complete system from a single source
- Users can implement their own services without having to manage the operation and maintenance of the necessary service IT infrastructure
- Access to extensive technical expertise – both for the operation of the IT infrastructure and the support of service engineers in the maintenance of the automation systems

The Simatic Remote Services enables Siemens service specialists to have a close look at the virtualized system for fast and efficient troubleshooting. Sinema Remote Connect is the software basis for secure connections to the system and for the user management. There is also the option to implement system condition monitoring via the MindSphere cloud solution. ■

➔ siemens.com/mapp





MindSphere

The operating system for the world of things

Today it is impossible to imagine daily routines without linked data – both in everyday life and in industry. Now the cloud-based IoT operating system MindSphere offers even more openness to make intelligent use of the vast variety of collected data.

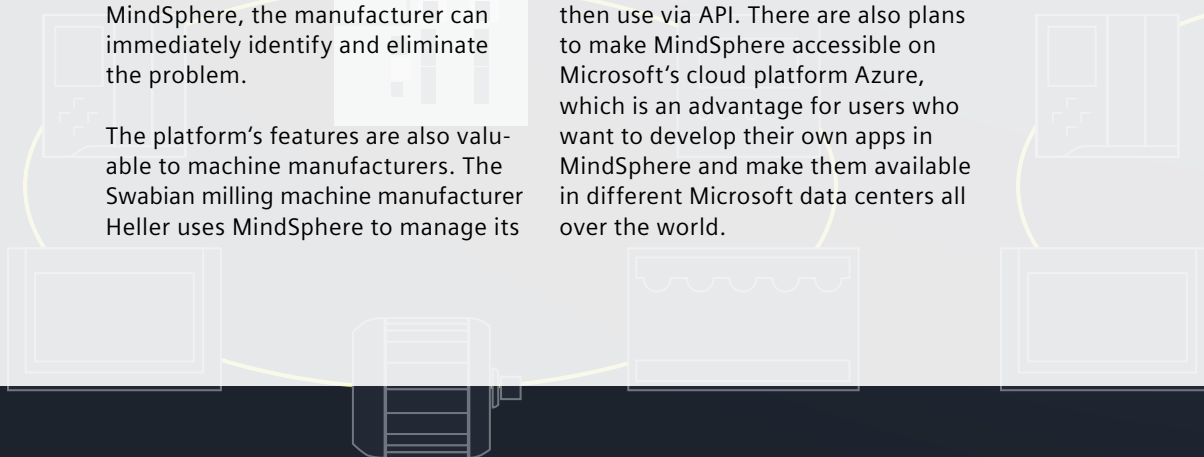
Whether it is in buildings, traffic systems, or hospitals, linked data create a high level of transparency that benefits users. Office buildings, for example, use more power during the daylight hours, which is when private households usually require less. These varying requirements can be balanced with intelligent networking. The open IoT operating system MindSphere offers a platform for linking these data by collecting and analyzing large data volumes, ultimately converting them into relevant information. The operating system is of particular interest for industry. For example, for end customers the system can be quite practical if a product doesn't work properly and a warranty case emerges. Thanks to MindSphere, the manufacturer can immediately identify and eliminate the problem.

The platform's features are also valuable to machine manufacturers. The Swabian milling machine manufacturer Heller uses MindSphere to manage its

tools in the tool holder as needed. The challenge the company faces every day is to produce customized parts in small batch sizes. When a customer places an order and the machine has to be retooled, the tool manager saves time and money.

Collaboration with experienced partners

To see how important MindSphere has become on the market, take a look at the steadily growing number of partners, including renowned companies such as Accenture, Atos, Evosoft, IBM, Microsoft, SAP, and many more. For example, with Watson Analytics and other analysis tools, IBM is introducing its analytical competence to MindSphere, which data analysts can then use via API. There are also plans to make MindSphere accessible on Microsoft's cloud platform Azure, which is an advantage for users who want to develop their own apps in MindSphere and make them available in different Microsoft data centers all over the world.





MindSphere



App Icon Fleet Manager



App Icon Fleet Manager for Machine Tools



App Icon KeepSecure!

Applications – open for many cases

With MindApps, the MindSphere ecosystem provides a series of applications for different areas. As a standard, MindSphere users receive the Fleet Manager, which they can use to configure all data (assets, data points, and many more) in virtually no time. Now the latest versions are supplemented with more convenient functions.

Because the data points to be monitored can be configured individually, users can select them during operation or else customize their screen. Companies can locate their connected assets at a glance on a geographical map. Machine tool manufacturers and users can use the Fleet Manager for Machine Tools. Thanks to its integrated Sinumerik 840D sl connectivity, you can map your entire machinery. The transparent visualization of the machine data, history, and status reduces the costs of inspection and maintenance. With the KeepSecure! MindApp, for the first time you can detect threats, security gaps, and anomalies using MindSphere. In the MindApp, customers can view reports such as safety warnings, status reports, current threats, and countermeasures taken. In a future version, users will also be notified of updates for their devices for additional protection.

One of the MindSphere operating system's strong points is its openness. With the open programming interface

MindApp API, customers and partners can create their own applications in MindSphere and use new digital services to, for example, increase plant availability and productivity. In the future, you will even be able to sell your own apps in the MindSphere App Store thanks to MindApp, or create a digital twin that recreates the entire product lifecycle by means of a model-based analysis.

In the cloud with no hardware

Users have been relying on the connectivity elements MindConnect Nano, MindConnect IoT2040, and Sinumerik with MindConnect to securely read assets and transfer them to MindSphere. With the Ruggedcom RX1400 with MindSphere connectivity, the right hardware for harsh environments is now available.

If you use the MindConnect Lib, which is currently in its beta stage, you can also connect to MindSphere with no hardware. Thanks to this library, you can program embedded devices yourself and then connect them to MindSphere. The prerequisite for this is the open interface MindConnect API that allows users to later prepare their own device for MindSphere.

➔ siemens.com/mindsphere

Industrial Security

With its product and service portfolio for industrial security, Siemens also helps plant operators implement the necessary measures on all levels to guarantee productivity.

Plant Security Services

Avoiding security gaps

Production processes are especially vulnerable to virtual threats, so they require a very high level of protection. Plant Security Services detect threats and security gaps in time, analyze weaknesses, and immediately initiate countermeasures. The offer includes comprehensive consulting (Assess Security), technical implementation (Implement Security), and permanent monitoring of the security status as well as continuous updates to the measures implemented in accordance with the constantly changing threats (Manage Security).

Malware from storage media, human or technical error, remote access hacking, or compromised smart-phones: the fast-growing plethora of new security risks and cyber threats in the production sector require fast reactions. That is why Industrial

Security Monitoring is at the core of Manage Security. All machine or plant data are monitored in the cyber security operation centers in Lisbon and Munich (for Europe and the Middle East) or Milford (for US customers). At these centers, experts determine whether an irregularity is a real threat or the result of a noncritical event like an exchange of devices. Monthly status reports ensure a high level of transparency that allows customers to assess the condition of the plant.

With its cyber security and automation expertise, Siemens is continuously expanding the range of devices supported for monitoring. In addition to Scalance devices and Simatic CPs with Security Integrated, the Simatic S7-1500 can now be monitored as well. Sinumerik 840D PCU50.x can also be protected by whitelisting. This is espe-

cially beneficial for users of older systems. Malware and unauthorized, untrusted applications are blocked, so fewer resources are needed and no signature updates are necessary.

A Siemens IPC replaces the McAfee hardware that were being used for data collection. The Connect Micro – Security Edition is based on a rugged Microbox IPC427E that was developed specifically for industrial applications.

Siemens offers a promotional package to customers who want to test Industrial Security Monitoring: for a one-time payment, you'll receive the Connect Micro – Security Edition and a specified number of your devices will be monitored for three months. ■

➤ siemens.com/plant-security-services



NEW FEATURES

- Monitoring of TIA components
- Whitelisting to protect the Sinumerik 840D PCU 50.x from malware and unwanted use
- Connect Micro – Security Edition based on a Microbox IPC427E
- Promotional package



Training

Sitrain training sessions provide expert skills and practical tips for the entire range of Siemens products for industry.

Remote Learning@Sitrain

Expertise at the push of a button

In order to keep up with the fast digital networking of Industrie 4.0, expert knowledge has to be available quickly. Remote Learning@Sitrain enables knowledge transfers via a certified and secure platform with certified trainers. The innovative learning methods cover everything worldwide from industrial tasks and industrial plants to expert knowledge from device manufacturers and the expertise of OEMs and users. Designed as a remote service, Remote Learning@Sitrain provides three use cases.

Three use cases – lots of benefits

In the first use case, participants are trained in a classroom with an instructor. In the second option, participants and trainer are in different places but are linked online. In the third case, individual participants can learn in a self-paced format without an expert present, and can take advantage of online training options at given times. In all cases, the training devices are located at Sitrain and access to them takes place via remote link – meaning that employees do not have to come to the information, but rather the information comes to them in the quickest possible way.

Remote Learning@Sitrain has a lot of advantages that can be enjoyed worldwide. For instance, employees can be trained on large virtual devices such as medium-voltage drives, and the devices can be used without

having to transport them to remote places around the world.

Digital interaction only requires a computer with a connection to the Internet and Internet Explorer 10 or 11 or Firefox ESR 45.0. Having well-trained personnel guarantees and promotes quality, optimizes production processes, reduces downtime, and therefore boosts competitiveness.

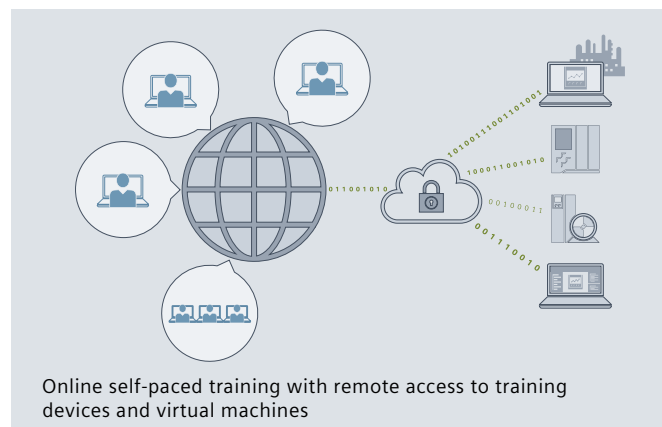
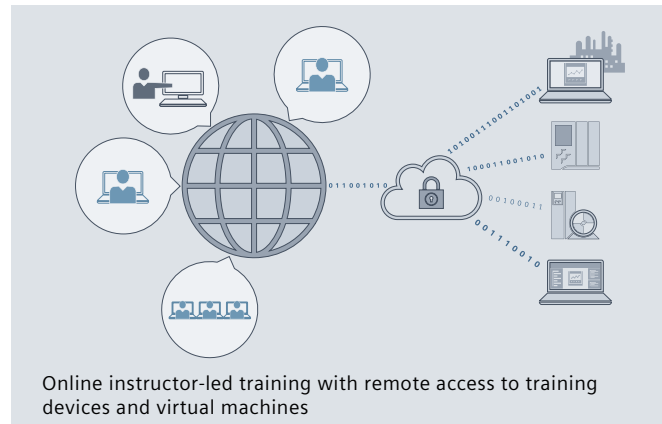
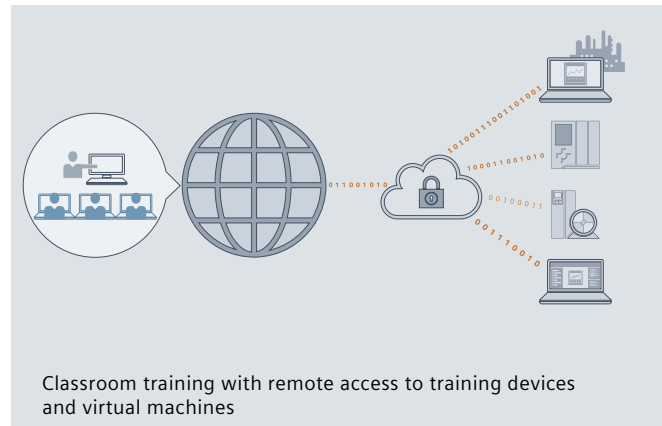
Remote Learning@Sitrain provides convenient access to the necessary expert knowledge regardless of

location – more or less at the push of a button. ■

➤ siemens.com/sitrain-remote-learning

HIGHLIGHTS

- Expert knowledge via remote access
- Independent of on-site training devices
- Digital learning
- Reduced costs
- Greater flexibility



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Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks. In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept. Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place. Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit siemens.com/industrialsecurity

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