

The background of the entire page is a composite image. It features a blurred photograph of a person's face, likely an engineer, looking at a device. Overlaid on this are various digital and technical elements: a blue wireframe grid, binary code (0s and 1s) floating in the air, and a glowing blue 3D model of a mechanical component. This 3D model has a vertical axis labeled '[mm]' with numerical markings from 0 to 60. The Siemens logo is positioned in the top left corner.

SIEMENS

Ingenuity for life

product news

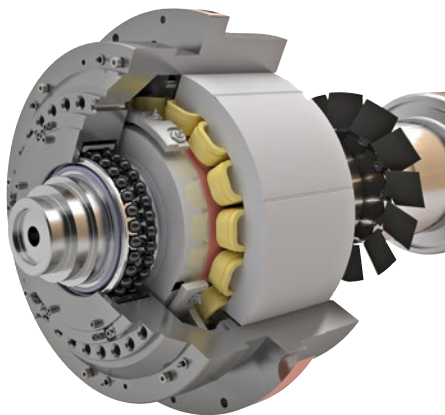
Innovations for the
Digital Enterprise

April 2016

siemens.com/tia

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Simotics Active Magnetic
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TIA Portal V14

The gateway to automation in the Digital Enterprise

Siemens helps industry capitalize on the opportunities digitalization offers. Products and systems for the Digital Enterprise give machine manufacturers and plant operators competitive advantages along the entire value chain. In the field of production engineering, TIA Portal is the gateway to automation in the Digital Enterprise.





Siemens AG

To remain competitive, manufacturing companies need to significantly improve their processes. Increasingly complex products must be placed on the market at ever shorter time intervals, and there is a continuously growing demand for customized products. This means that enterprises need flexible and at the same time highly efficient production processes, and these challenges can only be overcome with a holistic approach that enhances all the processes in the value chain. The Digital Enterprise – the enterprise that works digitally throughout – merges the worlds of virtual and real production. Software plays an important role here too. With its Digital Enterprise Software Suite, Siemens has established a portfolio of software prod-

ucts that enable customers to digitally support their entire value-creation process.

Greater flexibility, shorter time to market

Production engineering is an essential process in the value chain. TIA Portal supports machine manufacturers and plant operators in this process with consistent engineering, transparent operation, and the perfect implementation of digital work procedures. It reduces time to market by coordinating collaboration among interdisciplinary teams and by automatically generating automation solutions to replace manual programming. All this makes TIA Portal a central element on the way to the Digital Enterprise – especially in the

new version, Version 14, with new functions for digital processes.

The new functions include virtual commissioning with a digital twin, virtual networking with flexible cloud solutions, and open interfaces for greater connectivity, as well as consistency of data and transparency in production.

With increasing digitalization, comprehensive security in automation becomes more and more important. That is why Industrial Security is a core element of the Digital Enterprise, Siemens' solution for the path toward Industrie 4.0. ■

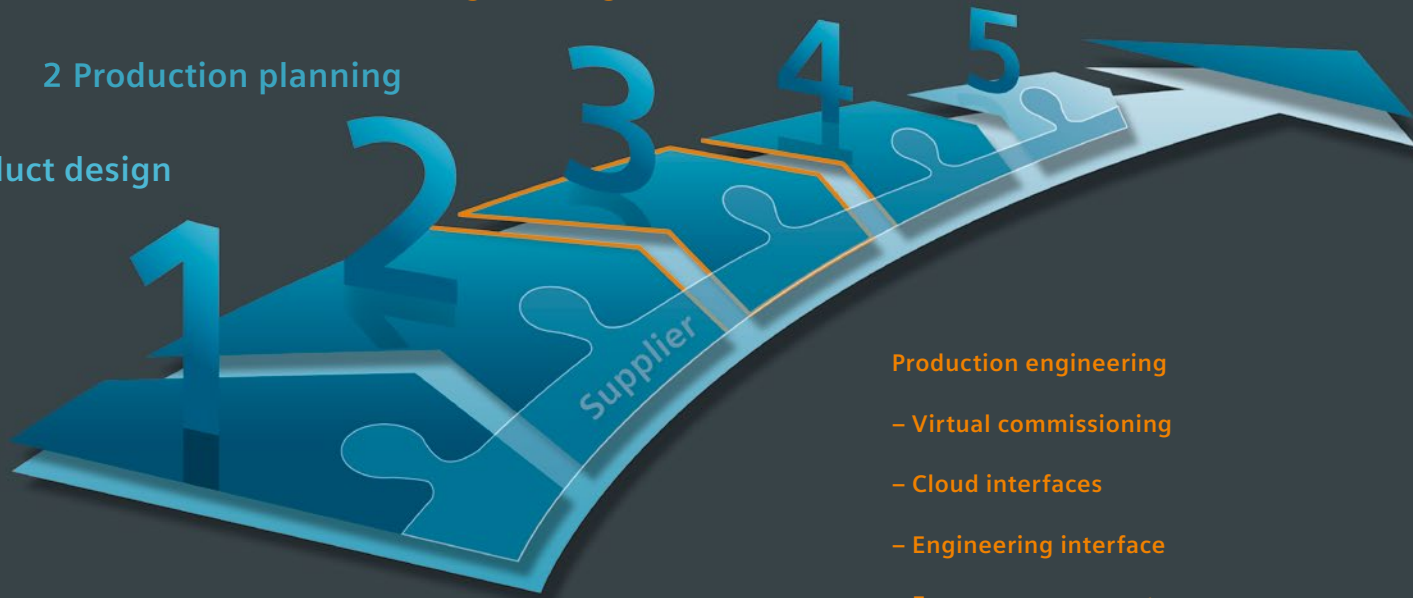
➤ siemens.com/tia-portal

4 Production execution

3 Production engineering

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Production engineering

- Virtual commissioning
- Cloud interfaces
- Engineering interface
- Energy management
- Multiuser functionality

Virtual commissioning

PLCSim Advanced provides a shorter time to market thanks to its interfaces and simulation software such as Plant Simulation and Process Simulate. A Simatic S7-1500 controller can be simulated as a digital twin with PLCSim Advanced to achieve much more efficient virtual commissioning.

Cloud interfaces

Another new feature is cloud-based engineering, which provides maximum flexibility. With the new TIA Portal Cloud Connector, users can access a plant's control system from their private cloud – with no installation at the engineering workplace required. For additional digital services, MindSphere – Siemens Cloud for Industry can be used as well.

Engineering interface

TIA Portal interacts with other systems and exchanges data through open interfaces. The Teamcenter gateway has a new interface for product data management in Teamcenter, the data collaboration platform for design, planning, and engineering.

Energy management

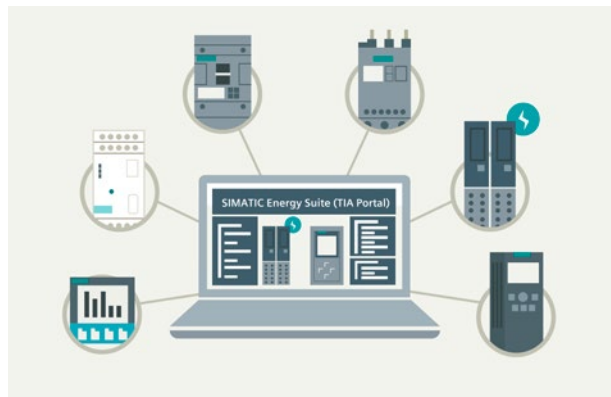
Further new functionalities in TIA Portal V14 reduce engineering costs and increase energy transparency during operations. Simatic Energy Suite makes it easy to assign parameters and evaluate many measuring components, as the required control program is generated with the push of a button. Simatic Energy Suite also increases the transparency of energy savings in accordance with ISO 50001 by capturing energy data and integrating them into the automation solution.

Multiuser functionality

The new multiuser functionality is valuable in distributed work environments. It provides multiple team members with efficient and simultaneous access to a single server project – with automatic synchronization. This allows automation tasks to be organized based on the device, object, and function.

Simatic Energy Suite V14 in TIA Portal

Efficient energy management



Simatic Energy Suite, an integrated option for TIA Portal, efficiently links energy management with automation and thus makes the energy aspect of production more transparent. Development costs are considerably reduced, as it is much easier to configure the energy-measuring components of the Simatic, Sentron, Simocode, Sinamics, and Sirius product families. Thanks to the integrated connection to Simatic Energy Manager Pro (the completely reinvented successor to Simatic B.Data) or to the cloud-based Energy Analytics service, the captured energy data can be seamlessly transferred to one energy management system

NEW FEATURES

- Simple and intuitive configuration instead of programming
- Automatic generation of PLC energy programs
- Integration into TIA Portal and automation
- Archiving on WinCC Professional or the PLC
- Seamless connection to Energy Manager Pro

extending over several locations. This also allows enterprises to address all the economic and management requirements – from energy purchases to planning to energy controlling – and ensure compliance with the ISO 50001 standard.

Another advantage: Simatic Energy Suite is simple to use. Users need minimal development know-how, as the program can be learned and implemented quickly. ■

➤ siemens.com/energysuite

TIA Portal

TIA Portal is the key to exploiting the full potential of Totally Integrated Automation (TIA). The engineering framework for all automation tasks integrates HMI, controller, distributed I/O systems, motion control, and drives seamlessly into a single engineering environment.

Simatic Field PG M5

Rugged hardware – optimized for TIA Portal engineering

The latest generation of the Simatic Field PG has been optimized for engineering with TIA Portal and is suitable for mobile use in tasks such as configuring, commissioning, service, and maintenance in machine- and plant-oriented environments. The Simatic Field PG M5 has a fast DDR4 RAM of up to 32 GB and shock-resistant SSD (solid-state drive) mass storage of up to 1 TB. The light, rugged, and completely protected magnesium housing makes it ideal for use in harsh industrial conditions. Impact absorbers on exposed parts of the device protect against shocks and vibrations. The integrated TPM (Trusted Platform Module) increases data security and provides hard disk integrity, and iAMT (Intel's Active Management Technology) and WoL (Wake on LAN) make remote administration via company networks easier.

The Simatic Field PG M5 comes with the latest version of TIA Portal engineering software for controllers and HMI. The Field PG is available in two versions: the Comfort version with the Intel Core i5 processor and the Advanced version that can also be configured with the Simatic S5 interfaces and has a more powerful Intel Core i7 processor. ■

➤ siemens.com/simatic-pg



NEW FEATURES

- Optimization for engineering with TIA Portal
- Up-to-date wireless and Bluetooth technology together with the latest Intel Core i5/i7 processor technology
- All current Simatic interfaces for industrial automation applications onboard
- Particularly rugged (semi-ruggedized) for use in harsh industrial environments

Simatic S7-1500 T-CPU

Motion control meets TIA Portal

For motion control applications, Siemens offers a coordinated package consisting of Simatic Advanced Controllers and Sinamics servodrive systems. Integrated in TIA Portal V14, the new Simatic S7-1500 T-CPU controller makes advanced motion control functions possible by combining Simatic and Sinamics. TIA Portal V14 is especially helpful in engineering motion control tasks involving electronic drives or cam discs, for example. With the integrated cam disc editor, configuring and optimizing the motion relation between guide and subsequent axes becomes much easier. The curve discs can be machined or reproduced even while the machine is running, which may be necessary during product changes, for instance.

The new S7-1500 T-CPU is also suitable for safety applications, meaning that the user needs only one controller for standard, safety, and comprehensive motion control automation tasks.

The new Sinamics V90 servodrive system with Profinet adds speed and precision to the machine (read more about Sinamics V90 on p. 22). In addition to operation in TIA Portal V14 with the new Simatic 1500 T-CPU Advanced Controller, the servodrive system is also perfect for use in combination with the Simatic S7-1500 Advanced Controller and Simatic S7-1200 Basic Controller.

With this new package, users are able to perform advanced motion control tasks easily and efficiently in the familiar Simatic environment. ■

➤ siemens.com/s7-1500



NEW FEATURES

- Well-coordinated package consisting of Simatic Advanced Controllers and Sinamics servodrive systems integrated into TIA Portal V14
- Sinamics V90 servodrive system with Profinet for speed and precision in the machine
- Easy execution of advanced motion control tasks such as geared synchronous motion and camming with TIA Portal integration
- Only one controller for standard, safety, and motion control automation tasks

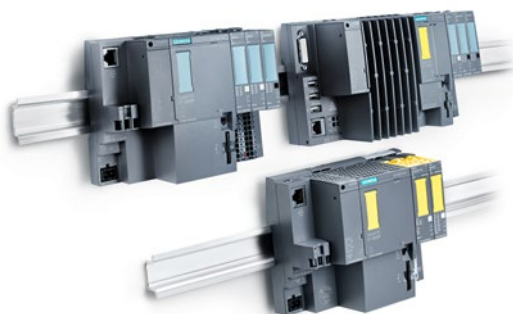


Automation systems

Simatic automation systems offer the right product for any application. The new generation includes Basic, Advanced, Distributed, and Software controllers. The controllers all have failsafe functionality, and the Simatic S7-1500 Advanced Controller features advanced Motion Control.

Distributed Controller – Simatic ET 200SP Open Controller / Simatic ET 200pro CPU

For standard and failsafe applications



The Simatic ET 200SP Open Controller has been complemented by a controller with Simatic S7-1500 technology that is for the first time able to perform standard and failsafe automation tasks in one device: the new, powerful CPU 1515SP PC F. Other advantages of the new controller are low engineering, evaluation, and service costs; reduced spare parts inventory; and minimal space requirements in the control cabinet. The modular Simatic ET 200SP Open Controller combines all the functions of a PC-based software controller

with visualization, Windows applications, and central I/Os in one compact device and is particularly suitable for series production of machines.

The new failsafe CPU 1516pro(F)-2 PN Distributed Controller of the Simatic ET 200pro series also performs standard and failsafe automation tasks in one device – up to performance level e (PLe). The new CPU is also available as a standard version. The especially compact, rugged, and efficient Simatic ET 200pro distributed I/O system in protection class IP65/67 can be mounted directly onto the machine. ■

➔ siemens.com/distributed-controller

NEW FEATURES

- **Simatic ET 200SP Open Controller CPU 1515SP PC F**
 - Safety version for standard and failsafe tasks
 - Low energy costs, minimal space required, and fewer spare parts required (photo at left)
- **Simatic ET 200pro CPU 1516pro(F)-2 PN**
 - Safety version for standard and failsafe tasks up to PLe
 - Standard version for standard automation tasks (photo below)



Simatic S7-1500 Software Controller Failsafe

Safety functions integrated

For the first time, the Simatic S7-1500 Software Controller is now available with integrated safety functions. The new CPU 1507S F is the world's first software controller with a PC-based controller that is operated independently from the Windows operating system. This results in very high system availability. It enables a rapid controller start-up and ensures Windows up-dates and reboots during ongoing operation.

Also, an additional safety controller is not necessary. This saves space and reduces cost and engineering effort. Due to the combination of PC-based controller and high-level programming language, the Simatic S7-1500 Software Controller is particularly suitable for special machine construction. ■

➔ siemens.com/software-controller

NEW FEATURES

- Failsafe PC-based S7-1500 Software Controller
- Operation independent from Windows operating system
- Elimination of need for additional safety controller



Simatic Target 1500S for Simulink

Model-based software development



NEW FEATURES

- Simulation of control behavior in Simulink (MiL, SiL, HiL)
- Automatic generation of executable code for Simatic S7-1500 Controller such as Software Controller, Open Controller, and CPU 1518 ODK
- Support for the External Mode Simulink interface for higher productivity through optimization with real values from running operations

Many users wish they could transfer automation functions created and tested in Matlab/Simulink directly to a Simatic Controller. Matlab/Simulink Target now makes this possible. The simulation software simplifies and optimizes the development of complex automation solutions while at the same time reducing development time and costs. With Matlab/Simulink, complex mathematical models can be easily generated, visualized, and made available as control algorithms. Various program modules written in high-level language can be implemented directly into the control program via the ODK interface, and because the executable Simatic codes are generated automatically, no C++ or ODK know-how is required. As an example, Matlab/Simulink for Simatic S7-1500 is perfect for the pitch control of wind energy plants: by simulating various scenarios, the program is able to identify what pitch provides the best possible energy yield. ■

➤ siemens.com/simulink

Simatic S7-1500 CPU 1518 ODK

Open for ideas

The Simatic CPU 1518 is the most powerful CPU in the Simatic S7-1500 Advanced Controller series. With the new Simatic CPU 1518-4 PN/DP ODK, users can now benefit from this performance and at the same time use customer-specific high-level language programs directly in the CPU's control program. In addition, users can continue to employ their technological know-how in the form of C/C++ algorithms on the S7-1500. C/C++ applications are developed with the Simatic ODK 1500S engineering tool. The ODK engineering package includes Eclipse functions used to generate real-time applications for technology, control functions, or complex mathematical algorithms. Users do not need any knowledge of high-level language

thanks to the automatic generation of Step 7 modules. PLC programmers can use these functions intuitively. For the first time, users can integrate complex Simulink models into the control program of a Simatic S7-1500 Controller using the Simatic Step 7 Target 1500S engineering package and the CPU 1518 ODK. This allows them to benefit from the advantages of model-based development with Simulink directly on an S7-1500 Controller. ■

More on the S7-1500 on page 30:
[connection to mixed industrial environments via integrated OPC UA server](#)

➤ siemens.com/s7-1500



NEW FEATURES

- Programming of C/C++ functions via Simatic ODK 1500S
- C/C++ programming with Simatic ODK 1500S with Eclipse development environment
- Execution of controller functions that have been generated with Simatic Target 1500S for Simulink

Simatic S7-1200 CPU 1212FC

The microcontroller for standard and safety tasks

Just like the more powerful CPU 1214F and CPU 1215FC versions, the new CPU 1212FC performs standard and safety-related automation tasks in a single device, for example monitoring a protective door. This reduces the wiring effort compared to conventional solutions. Safety related devices can be connected via Profinet because the CPU also supports Profisafe now. (Requires TIA Portal V14 and Firmware V4.2) So the integrated Safety of a Sinamics drive can be controlled via Profinet (no extra hardware required). This further reduces wiring effort, saves more space than conventional safety solutions, and allows for more flexible safety solutions. ■

➔ siemens.com/s7-1200

**NEW FEATURES**

- Reduced wiring effort
- Direct control of distributed I/O devices via Profisafe

SM1238 Energy Meter Module

Introduction to machine-oriented energy management

**NEW FEATURES**

- Evaluation of up to 200 measured energy values
- Very compact, with a width of just 45 mm
- Energy data processing directly on the CPU

The accurate recording of energy consumption is essential for enterprise energy management. The SM1238 Energy Meter Module for the Simatic S7-1200 is perfect for cost-efficient, entry-level machine-oriented energy management. At just 45 mm wide, this module is extremely compact and saves space in the control cabinet. It also enables energy management with up to 200 measured energy values. The Energy Meter Module records electrical values in a single or three-phase network and measures voltages up to 400 VAC. External current transformers (1 A or 5 A) with a conversion factor of up to 10,000 are used to measure the current. Measured and internal values can be directly parameterized in RUN. The measured energy data can be processed directly in the CPU and visualized on the HMI system (e.g., Basic or Comfort Panel). ■

➔ siemens.com/s7-1200

Simatic S7-1200 FW4.2

Increased flexibility and safety

With TIA Portal V14, the Simatic S7-1200 has been upgraded to the new firmware, Version 4.2. Users benefit from functions such as the Media Redundancy Protocol (MRP) in the case of dual-port CPUs. Due to the large number of topology versions – ring topologies are feasible as well – this protocol provides greater flexibility in establishing networks and higher network availability. To prevent data loss, the new version of the firmware offers a backup/restore function of the S7-1200 with remanence data, where project data are saved with up-to-date values. ■

➔ siemens.com/s7-1200

**NEW FEATURES**

- Media Redundancy Protocol with flexible topology versions
- Backup/restore with remanence data
- Backup of project data with up-to-date values

Simatic ET 200SP Energy Meter

Distributed capture of energy flows

NEW FEATURES

- More than 40 measured energy values for efficient energy management
- Data capture of electrical parameters in single-phase and three-phase networks up to 400 or 480 VAC, respectively
- Data capture with an accuracy of $\pm 0.5\%$ with retentive data storage and information on network quality



The flexible and compact Simatic ET 200SP distributed I/O system has been supplemented by a new energy meter module: the AI Energy Meter 480VAC ST. In addition, the AI Energy Meter 400VAC ST has been updated. With more than 40 measured energy values and a data accuracy of $\pm 0.5\%$, the devices lay the perfect foundation for efficient energy management. The ET 200SP Energy Meter is part of a certified data management system in accordance with DIN EN ISO 50001. Together with Simatic Energy Manager Pro, the successor to Simatic B.Data, and Energy Analytics, it supports the requirements of an energy baseline and evaluation, including energy performance indicators, monitoring, measurement, analysis, and management review. ■

➔ siemens.com/io-system

Simatic CPs for ET 200SP Distributed Controller

Flexible communications options

Three new communications processors (CPs) for additional communications interfaces expand the areas of application of the Simatic ET 200SP Distributed Controller. The CP 1542SP-1 communications processor enables the ET 200SP system to be flexibly expanded with an additional Industrial Ethernet interface. This allows identical machines to be set up with the same IP address by separating the networks.

With the CP 1543SP-1 communications processor, the Simatic ET 200SP Distributed Controller can be connected to an Industrial Ethernet network for networking and incorporation into higher-level control systems with integrated security functions. For secure access to the ET 200SP, the CP 1543SP-1 features a stateful inspection firewall and VPN with IPsec encryption of all transmitted data.

By setting up appropriate firewall rules, access permissions can be clearly defined for remote and local access. The CP 1542SP-1 IRC communications processor supports the DNP3, IEC 60870-5-104, and TeleControl Basic open telecontrol protocols for connection to a telecontrol control center (see page 29 for more information).

The communications processor functions are configured in TIA Portal with the Step 7 Professional V14 engineering software. All communications processors provide extensive diagnostic options – locally by LED error indication, in the Simatic Step 7 engineering tool, or using the web server of the ET 200SP CPU. ■

➔ siemens.com/cp-for-et200sp

Distributed I/O system

With the Simatic ET 200, Siemens offers a modular and finely scalable system for distributed automation in the control cabinet or directly on the machine.

NEW FEATURES

- CP 1542SP-1: Flexible extension of the ET 200SP system with additional Industrial Ethernet interfaces
- CP 1543SP-1: Stateful inspection firewall and VPN protocol (IPsec) to protect the Simatic ET 200SP Distributed Controller from unauthorized access
- CP 1542SP-1 IRC: Connection of remote terminal units (RTUs) to a telecontrol control center with the Simatic ET 200SP Distributed Controller and telecontrol protocol



HMI devices for special requirements

Safe operation and monitoring in all industries

New devices for operating and monitoring processes in special environments have been added to the Simatic HMI portfolio. The Simatic IPC477D Pro and an Industrial Flat Panel monitor – both featuring 22-inch displays – are devices in IP65 degree of protection that can be installed directly in the production environment thanks to their closed housings and various mounting options.

The new Simatic Inox Pro devices in a high degree of protection, IP66K, are optionally available as the IPC277E Inox Pro Simatic Panel PC or the IFP1900 Inox Pro Ethernet monitor. These products are suitable for hygienic production areas. The stainless steel devices have an analog resistive 19-inch touch display with chemically resistant decorative foil, seals suitable for use with foods, shatter protection for the display, and a smooth surface to prevent contamination.

The rugged Simatic Panel PC Ex OG has been designed for use in the chemical, oil, and gas industries. Designed in IP66 degree of pro-



tection and able to withstand temperatures of -40°C to $+65^{\circ}\text{C}$, it is ideally suited for Ex zones 1/21 and 2/22. The capacitive multi-touch glass display with automatic brightness control is available in 15-inch/4:3 and 22-inch/16:9 formats and is glare-free. It can even be operated with thin gloves. A fast Intel Core i7 processor complemented by 8 GB RAM and a 300-GB SSD (solid-state drive) make this device ready for the future. ■

NEW FEATURES

- Safe operation and monitoring outside the control cabinet
- Mounting on a support arm or pedestal
- Application in hygienic production areas and in the oil, chemical, and gas industries

➔ siemens.com/special-hmi-devices

Simatic IOT2000

The intelligent gateway for Industrie 4.0 solutions

In Industrie 4.0, production data are collected and evaluated in the cloud to optimize production. The Simatic IOT2000 (Internet of Things) functions as an intelligent gateway between the cloud (e.g., MindSphere – Siemens Cloud for Industry) and production, harmonizing communication between the

various data sources, analyzing it, and forwarding it to the appropriate recipients, in both directions. One specific example of a Simatic IOT2000 application is the preventive maintenance of machines. The gateway collects and saves relevant data and communicates them to cloud-based analysis tools. The Simatic IOT2000 can also be used as a freely programmable interface to the enterprise resource planning (ERP) system. This allows the direct communication of order data from the ERP system to production, thereby accelerating the production process, minimizing errors, and increasing order-processing transparency. ■

➔ siemens.com/iot2000

Industrial PCs

From compact, fanless embedded IPCs to powerful expandable, high-end IPCs, the products from the Simatic IPC family are the ideal basis for many PC applications in the production environment.

NEW FEATURES

- Open platform for the collection, processing, and transfer of data directly to production
- Energy-saving Intel Quark processor and numerous interfaces
- Excellent ruggedness, reliability, and longevity
- Various options for programming in high-level languages
- Compact design and DIN rail mounting



Simatic IPC547G

State-of-the-art PC technology for industrial use

The innovated Simatic IPC547G provides the latest PC technology in a completely reinvented industrial design. Intended for use in industrial environments, it performs well as a workstation or server in industrial applications that require high system and data availability in addition to high processing power. The enclosure design of the IPC547G has taken a further development step forward, while always keeping continuity and compatibility with earlier versions in mind. Its service-friendliness sets new standards in this class, simplifying the extension of the IPC and reducing maintenance effort. At the same time, new security functions provide for increased access protection. ■

➤ siemens.com/ipc547g



NEW FEATURES

- High system performance thanks to Intel Xeon/Core i processors (6th generation), DDR4 memory up to 64 GB
- New housing design for enhanced user-friendliness
- High system and data availability with RAID systems (HDD or SSD)



Simatic IPC427E / IPC477E

Powerful, maintenance-free, flexibly configurable

NEW FEATURES

- Top performance in embedded segment with 6th-generation Intel processors
- Flexibility thanks to the many integrated interfaces
- Maintenance-free, fanless design and with a rugged metal housing for use directly on the machine
- High mounting flexibility for space-optimized installation

The Simatic IPC427E embedded Microbox PC offers machine, plant, and control cabinet manufacturers a compact PC platform for machine- and process-oriented use in industrial environments. Applications range from complex control tasks (including in high-level languages) and visualization solutions to production-oriented data collection and analysis. Due to its fanless design and the use of SSD (solid-state drive) hard drives or CFast memory, it has no moving parts and thus increases system availability.

The Simatic IPC477E embedded panel PC has been designed for use directly

on the machine when ruggedness and maximum reliability are the most important requirements in addition to the openness of a PC. Thanks to its low mounting depth, the device can also be used when there is limited space available. The Simatic IPC477E is the ideal platform for PC-based automation, both in production and in process automation, where it is integrated into control cabinets and panels. ■

➤ siemens.com/ipc427e

➤ siemens.com/ipc477e

Simatic WinCC Open Architecture V3.14

Fit for the future

Simatic WinCC Open Architecture (OA), the scalable SCADA system compatible with varied hardware systems, has been considerably modernized in the new version, Version 3.14. Several new features for plant visualization have been integrated into the graphics editor to create a modern look and feel. With the Ultralight Client UX based on HTML5 for desktop applications and a client for iOS and Android devices, web access has also been further developed. This guarantees worldwide access to plant information anytime, anywhere. An OPC HDA driver is also available, enabling the data browsed to be displayed more transparently. ■

➤ siemens.com/wincc-open-architecture



NEW FEATURES

- Extended graphics editor: new animation options, switchable color schemes, definition of customer style sheets
- HTML5-based client for desktop applications
- Native iOS and Android user interfaces
- Support for the new Simatic IPC227E or 277E Nanobox PC

Human Machine Interface

Simatic HMI – Efficient to a new level. This is the tagline for a consistent HMI portfolio from a one-stop shop that can be used to implement the most versatile applications efficiently and economically.

WinCC V7.4 SCADA system

Scalable and even more efficient and open

The focus of the new Version 7.4 of the WinCC SCADA system was on achieving even greater efficiency and openness. Siemens has also significantly extended the WebUX option, which enables the web-based operation and monitoring of production lines with mobile end

devices via the Internet. The system now supports both the most common WinCC controls and the dynamization of objects via script. ■

➤ siemens.com/wincc-v7



NEW FEATURES

- Efficient engineering thanks to optimized methods of mass data processing
- Greater openness thanks to compatibility with standard interfaces such as OPC UA, etc.
- More flexible mobile web access via conventional HTML5-supporting devices and remote operating stations
- Process diagnostics for quick and easy overviews of plant status
- Advanced connectivity for use in plants of any kind
- XML interface for integration into the IT world

Simatic HMI in the machine-oriented sector

An eye for efficiency

The integrated hardware and software systems of Simatic HMI and Simatic IPC efficiently meet all the requirements of state-of-the-art machine-oriented Human Machine Interface solutions. The system portfolio offers innovative technologies and solutions for a wide variety of applications in all industries, from Panel-based entry-level devices from the HMI Basic family, such as the Key and Basic Panels for cost-effective visualization solutions, to high-performance Panel-based and PC-based devices from the HMI Advanced family, such as Comfort and Mobile Panels or Panel PCs and multi-touch devices for the most sophisticated and complex operating solutions. All the systems can be efficiently configured in the TIA Portal engineering framework, allowing users to generate machine solutions that perfectly match the given tasks in no time at all. ■

➤ siemens.com/hmi



NEW FEATURES

- For simple visualization tasks
- **Basic HMI**
Key and Basic Panels, devices for special requirements
- For sophisticated visualization tasks
- **Advanced HMI – Panel-based**
Comfort and Mobile Panels, devices for special requirements
- **Advanced HMI – PC-based**
Panel and Box PCs, including monitors, thin clients, devices for special requirements

TIA Selection Tool

Intelligent online catalog

Users can select, configure, and order devices for Totally Integrated Automation (TIA) with the TIA Selection Tool. It combines the usual configurators for automation technology in one tool and offers much more. The tool can be accessed directly from the browser, at siemens.com/tstcloud, or downloaded as a file to run on Windows computers. The TIA Selection Tool provides wizards for selecting individual devices and entire plants. It helps the user select modules and accessories, checks slot rules, and prevents errors during selection. The TIA Selection Tool generates a complete order list directly from the products selected or configured by the user, and this list can be directly exported into the Industry Mall shopping cart. Components that can be selected and configured include PLCs, distributed I/O systems, HMI panels, industrial PCs, drive systems, industrial controls, software, communications technology, power supplies, and industrial identification systems. Users can also create Profibus and Profinet networks, configure their topology, and select associated cables and connectors. ■

➤ siemens.com/tst



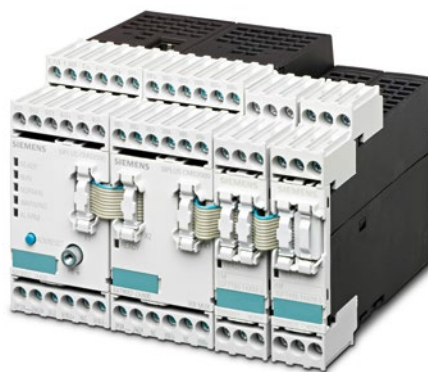
NEW FEATURES

- Quick selection, configuration, and ordering of components from the TIA portfolio
- Error-free order processing thanks to intelligent selection assistance
- Cloud-based solution optimized for tablets and touch operation
- Time savings of 80% compared to conventional catalogs

Siplus CMS2000

Rpm range extended

The new Siplus CMS2000 condition monitoring system monitors up to three drivetrains with different frequency ranges while at the same time offering enhanced analysis options for the recorded signals. With the Siplus CMS2000, signals can be recorded, evaluated, diagnosed, and visualized with the help of web browsers via IEPE vibration acceleration sensors. For simple analysis of recorded values, trend flows for ranges can be recorded – for example, to enable better assessment of the wear and tear of mechanical components.



NEW FEATURES

- Extension of monitored rotational speed range from 120 to 24,000 rpm
- Ability to record range trends
- Up to 16 vibration acceleration sensors for signal recording

In addition to vibration acceleration, the Siplus CMS2000 can also monitor temperatures, analog signals, and rotational speed. Monitoring of rotational speed was previously possible for speeds of up to 6,000 rpm, but with the new firmware it is now possible to monitor speeds of up to 24,000 rpm, for example, in machine tools. ■

➔ siemens.com/siplus-cms

Siplus extreme Rail

Intelligent choice for rail applications

The Siplus extreme product family has been extended with the addition of high-performance rail controls. The new controllers from the Siplus S7-1500, S7-1200, and ET 200SP series are coated industrial products and have been approved in accordance with the requirements of EN 50155, EN 45545, and EN 50121.

Each controller can perform a wide variety of automation tasks in the rail system, not only in the train itself but also along the railway track. For example, the control of HVC (heating, ventilation, and climate) can be performed via an S7-1500 with digital inputs and outputs.

The S7-1200 Basic Controller is widely used to control sanding or light systems. The ET 200SP controls the Sidoor platform screen door drive systems. Configuration, commissioning, and

operation are all performed using the usual tools for industrial automation, such as TIA Portal and the TIA Selection Tool.

Because Siplus extreme Rail is used in rail traffic, the device's behavior in case of fire is observed, along with the side effects of the materials used in construction. The results are used to calculate

the operational categories of the entire train, which are specified in the EN 45545 fire safety standard. In addition, the device has been strengthened to resist vibrations and shocks.

➔ siemens.com/siplus-extreme-rail

Products for specific requirements

Products and systems for specific markets and custom requirements offer a high level of ruggedness, efficiency, and flexibility.



NEW FEATURES

- Innovative control solutions for rail traffic and signal systems
- Approval in accordance with EN 50155, EN 45545, and EN 50121
- Uniform configuration, parameterization, and commissioning thanks to seamless integration into TIA Portal
- Elimination of need for overvoltage conductor, thanks to interference resistance through EMC

Sidoor MDG400 NMS motor

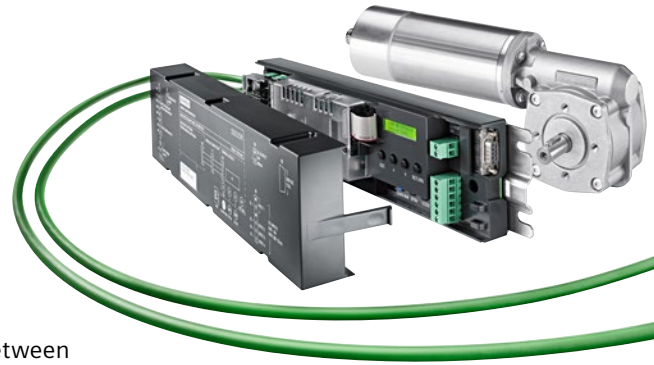
Highly flexible

The Sidoor portfolio is complemented by the addition of the new MDG400 NMS motor. The motor is delivered with a drive shaft with key without pinion. By adjusting customer-specific pinions, the proven Sidoor door drive can be flexibly integrated into the customer's applications and is thus suitable to drive gear racks, chain drives, and toothed belts. The drive system stands out due to its high dynamics, optimum control quality, no maintenance, and safe control of door force and energy. The new firmware V1.05 of the ATD4xxW industrial control devices is used for the new Sidoor motors. As a

result, the MDG400 NMS can be operated with drive gears with an effective diameter between 28 mm and 122 mm and thus offers optimized door force and speed.

When using NMS motors, users can also benefit from the unique features of the Sidoor drive system: the automatic teaching run with drive profile identification and safe control of door force and energy. ■

➔ siemens.com/sidoor

**NEW FEATURES**

- Use in a wide variety of applications, thanks to various adaptation options
- Integration into existing machine and plant automation
- Safe control of door force and energy, even in the case of neutral mechanical interfaces
- Greater motor output power, faster door speed

Sitop PSU8200 24 V / 40 A

Compact power supply for single-phase networks

The new single-phase 40-A power supply from the Sitop modular product line with a width of only 150 mm needs 90 mm less space on the DIN rail than the earlier Sitop PSU100M model. It is not necessary to leave gaps between neighboring devices. The efficiency of the new Sitop PSU8200 has been increased by 4 percentage points, to 92%, which guarantees low energy consumption and less heat generation in the control cabinet. With the addi-

tion of 50% extra power, the overload capacity has been increased once more. The wide-range input now features an automatic switchover between 120 V and 230 V and allows for trouble-free connection of single-phase networks worldwide. The wide temperature range, which has been expanded for cold environments of 0°C to -25°C, is another feature enabling the devices to be used universally. Also, the new Sitop PSU8200 still offers all the advantages

of Sitop modular: excellent overload behavior thanks to the power boost with threefold nominal current for 25 ms; selectable parameters for parallel operation and overload behavior; comprehensive certificates such as ATEX, IECEx, and GL; and extendibility with all Sitop add-on modules. ■

➔ siemens.com/sitop

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.

NEW FEATURES

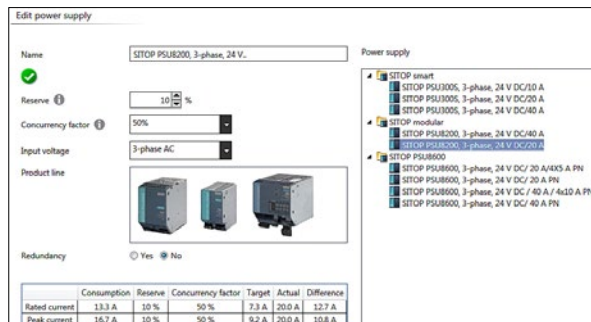
- Wide-range input of 85 to 132 V / 170 to 264 V AC with automatic range switch 120 / 230 V AC
- Very narrow installation width of 150 mm
- Very high efficiency of up to 92%
- Extra power with 1.5-fold nominal current for 5 s/min
- Wide temperature range of -25°C to +70°C



TIA Selection Tool – 24-V load view

Easily select project-specific power supplies

Automation components for plants or machines can be selected quickly and easily with the TIA Selection Tool. The new 24-V load view makes it possible to select the right Sitop 24-V power supply for the automation products that have already been selected. The power requirement of the 24-V loads is calculated automatically and is already considered in the selection of the power supply.



All preselected 24-V devices are displayed with their respective power requirements in the 24-V load overview. After that, the devices can be linked with one or more Sitop power supplies by drag and drop, and the required nominal and peak currents are taken into account when selecting the right power supplies. The selection wizard for the power

supplies can be launched under "Edit." The displayed list includes only power supplies providing the total power requirement of the devices to be supplied. Clicking on the "Confirm" button adds the power supplies to the overall order list. Changes can be made at any time, including to the redundant design of the selected power supply. ■

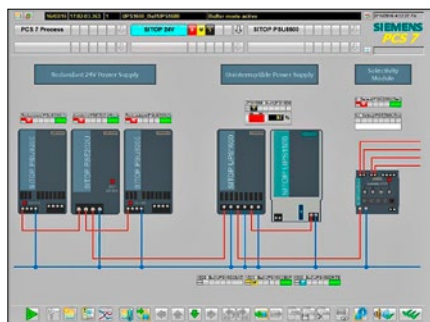
➔ siemens.com/sitop

NEW FEATURES

- No calculations or searches for technical data on the power requirements of individual components
- Option to integrate third-party devices, e.g., sensors or actuators that were not selected in the TIA Selection Tool
- Many different parameter settings: provision for more loads, coincidence factor, inlet voltage, or product line

Sitop library for Simatic PCS 7

Identifying plant conditions automatically



NEW FEATURES

- Sitop library for simple integration of 24-V supply features (redundant power supply, selective monitoring of 24-V load circuits, buffering in case of a power failure) into the Simatic PCS 7 process control system

- Automatic information on operating conditions, maintenance requirements, and failures
- Readout and visualization of selected device data
- Free download (software modules, documentation) via Service and Support

A reliable 24-V power supply is one of the key prerequisites for high availability in plant operation. For this purpose, Sitop offers single-phase or three-phase basic power supplies with various outputs of up to 1,000 W and comprehensive certifications such as ATEX or IECEx as well as MTBF (mean time between failures) values of more than 600,000 hours in 24-hour nonstop operation. The power supplies can be scaled and extended depending on the requirements and plant configuration.

For preferred power supply configurations, the Sitop library with modules and faceplates for direct integration into Simatic PCS 7 is available to users.

The software modules in the Simatic S7 supply the faceplates in the user interface of the process control system with operating and diagnostic data, generate notifications, and ensure a link to the maintenance system of PCS 7. This enables consistent transparency of the

24-V supply in the control system. PCS 7 users automatically receive information on operating conditions (e.g., buffer operation), maintenance requirements (e.g., battery change), and failures (e.g., short circuit or overload in 24-V circuits). Thus, critical plant conditions can be recognized quickly, expenditures due to failures or downtimes can be avoided, and plant availability can be sustainably increased. ■

➔ siemens.com/sitop

Intelligent AS-i master station with Simatic ET 200SP CPU

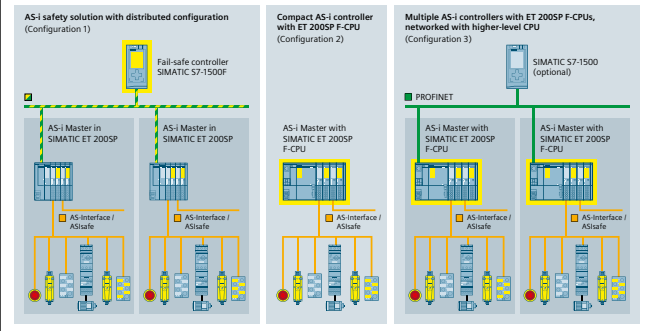
Combining the field and control levels

With the AS-Interface modules of the Simatic ET 200SP, AS-i networks can easily be connected to standard and safety control systems. In small and large complex plant configurations, one, two, three, or more AS-i networks can be quickly and effortlessly integrated into one station. As in any other modular system, the subassembly group CM AS-i Master ST is used for standard data, with the subassembly group F-CM AS-i Safety ST added for safety data.

In distributed systems with Profinet or Profibus input and output terminals, data are exchanged between the safety-oriented CPU and the AS-i networks via Profisafe. The safety signals of the AS-i slaves on the field are transmitted to the control system, where they are then analyzed and logically linked. Likewise, the control system's safety shut-off signals can be transmitted back to the AS-i slaves on the field level or processed directly in the ET 200SP station. In the latter case, the failsafe ET 200SP F-CPU merely replaces the Profinet interface module. If necessary, it is also possible to forward the signals preprocessed in the ET 200SP to a higher-level CPU, taking some of the burden off the higher-level CPU and contributing to making machines and plants more flexible. ■

➤ siemens.com/as-interface

Flexible safety solutions for your machine



NEW FEATURES

- Easy connection of AS-i networks to Profisafe with Profinet and applications with distributed controllers (ET 200SP CPU)
- Transparent exchange of standard and safety signals in both directions
- Centralized configuration of standard and safety technology in Simatic and Sinumerik with TIA Portal

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.



3SK2611-3AA00 diagnostic display

Find errors, reduce downtimes

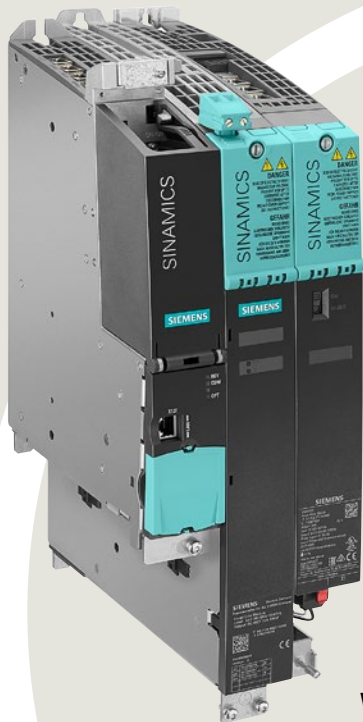
The solution of choice for finding an error after a plant standstill is the 3SK2611-3AA00 diagnostic display, in combination with the 3SK2 safety relay. With this pair, users can see at first glance which sensor was activated and can obtain relevant information on all events, including activated sensors and warnings. This allows them to find errors faster and to pinpoint them accurately, thereby reducing downtimes. In addition, no configuration is necessary in Safety ES.

The titanium gray enclosures of the new devices allow even ongoing projects to be easily saved and reloaded to the device after reset. And thanks to the new copy configuration function, this task can also be performed in series machine production, saving a great deal of time and effort. The display's backlight has also been improved and is now noticeably brighter. ■

NEW FEATURES

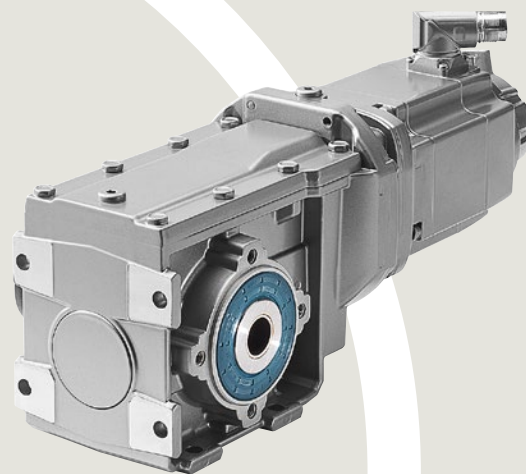
- Easy saving and reloading of ongoing projects
- Configuration copy function allowing use of several devices
- Brighter display

➤ siemens.com/safety-relays



Simotics S-1FG1 servodrive system
and Sinamics S120

A perfect team



With the Sinamics S120 converter and the Simotics S-1FG1 servo-gear motor, Siemens offers a perfectly matched drive system for servo applications. This system shows off its strength not only in dynamic and precise applications but also in engineering and commissioning processes and when integrated into automated systems.

A servo-gear motor always also needs the matching converter to operate. The highly dynamic Sinamics S120 single- and multi-axis drives and the Simotics S-1FG1 servo-gear motor are a perfect team; not only are the servomotor, gearbox, and converter perfectly matched, but there are also substantial advantages for engineering, commissioning, and integration into automated systems. With its ample integrated functionality and scalable number of axes, the Sinamics S120 can be used for numerous demanding motion control applications. Tailored solutions for greater productivity and flexibility can be implemented with high-performance single-axis drives and coordinated multi-axis drives with vector or servo control. Together with the electronic nameplate of the individual components, the Drive-Clq system interface ensures that drive systems are configured automatically, allowing for faster and fault-free commissioning. Thanks to prefabricated Motion Connect signal and power cables, the components can be connected easily and without problems.

Dynamic and precise

The new Simotics S-1FG1 servo-gear motor complements the already broad range of the Simotics motor portfolio. The motors are ideal for dynamic and precise motion sequences and are used in a variety of applications, for example, palletizers; rack retrieval systems with lift, travel, and fork drives; auxiliary drives for conveyor belt systems; metering pumps;

and flying saws. With four compact gear variants, motor shaft heights between 36 and 100, and finely graduated transmission ratios, it is easy to find the ideal drive for any application and mounting position, with torques of up to 8,000 Nm. Depending on the type of gear and size, cylindrical, offset, bevel, and contrate worm gears with up to 25 transmission ratios are available. The servo-gear motors are highly efficient and have little torsion tolerance. The pinion that is plugged into the motor shaft has a small diameter and therefore allows for a high transmission ratio in the first reduction step. This makes it possible to use two-step instead of three-step gears in some cases.

Consistent approach – greater efficiency

The servodrive system is an integral part of Totally Integrated Automation (TIA). The customer receives everything from a single source with this consistent system approach; in addition, much time and effort can be saved in the engineering and commissioning processes, and automation tasks can be implemented efficiently. ■

➤ siemens.com/servo-gear-motors

➤ siemens.com/sinamics-s120

Sinamics S120 booksize motor modules

Even more compact and rugged

Whether the task requires high-performance single-axis drives or coordinated multi-axis drives with vector or servo functionalities, Sinamics S120 offers the right design for customized converter solutions. The innovated booksize motor modules in the 3- to 30-A range are available in two designs – for continuous and discontinuous applications. The new modules impress with their compactness. In the case of the version for discontinuous applications, the overall width is reduced due to the dimensions of the additional motor modules and the new peak current load cycle without initial load. The new motor connection design also helps make the device more compact and improves its usability. Furthermore, the fan can be exchanged without having to remove the motor module, and a more solid mounting plate and more stable fixing lugs provide for increased ruggedness. The innovative shield design also makes it possible to use the greatest range of conductor cross sections with an improved shield connection. ■

➤ siemens.com/sinamics-s120

Integrated Drive Systems

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



NEW FEATURES

- Space savings in the control cabinet thanks to the improved power-to-weight ratio and the new motor connection design
- Improved usability and installation
- Increased ruggedness

Sinamics S120 in solar pumps

Perfect “light harvest”

NEW FEATURES

- Minimization of the dimensions of the installed photovoltaic output through MPPT
- Minimization of failures through integrated pump protection and a converter in accordance with industry standards
- Scalable solution in a wide power range (0.55–90 kW) thanks to the use of rugged and proven AC technology (a low-cost version with Sinamics V20 for 0.12–30 kW is also available)
- Remote maintenance via web server
- Worldwide service program



Siemens and IBC Solar have jointly developed a battery-free photovoltaic solution for pumps: the IBC Pump-Controller. The Sinamics S120 frequency converter with integrated Maximum Power Point Tracking (MPPT) is the key piece of the solution. It ensures that the solar modules always supply the maximum available power. This optimizes the “light harvest” of the solar modules so that they can be dimensioned smaller.

The Sinamics S120 with MPPT is already in use in the photovoltaic system at a farm in Namibia. The system replaces a diesel generator, ensuring reliable, environmentally friendly, and cost-effective irrigation. ■

➤ siemens.com/sinamics-s120

Sinamics V90 / Simotics S-1FL6 servodrive system

Supplemented with Profinet

The performance-optimized and easy-to-operate servodrive system consisting of a Sinamics V90 servo-converter and a Simotics S-1FL6 servomotor is now also available with Profinet, the Ethernet standard for automation. The portfolio of the Simotics S-1FL6 has also been expanded with the addition of an incremental encoder with 21-bit resolution.

In addition to the familiar 400-V versions with higher moments of inertia, there are versions with 200-V converters and motors with lower shaft heights and lower moments of inertia (Low Inertia, LI). The 200-V converters are up to 25% smaller, thus saving additional space in the control cabinet. Thanks to the motor's lower moment

of inertia, it is possible to cost-effectively perform many simple motion control tasks focusing on dynamic movements and processing in a wide variety of applications – for example, positioning, moving, and conveying. With a total of eight available converter sizes and seven motor shaft heights, the system covers a power range of 0.05 to 7.0 kW and is suitable for single-phase and three-phase grids. Together with the Simatic S7-1200 Basic Controller and the Simatic S7-1500 / 1500 T-CPU Advanced Controller, the Sinamics V90 servodrive system with Profinet offers a perfectly coordinated motion control solution that can be integrated into TIA Portal. ■

➔ siemens.com/sinamics-v90



NEW FEATURES

- Sinamics V90 servodrive system with Profinet, which gives the machine the necessary speed and precision
- Broad range of applications thanks to different converter sizes and motor shaft heights
- Sinamics V90 with Profinet and Simatic controller: perfectly coordinated motion control solution in TIA Portal

NEW FEATURES

- Smallest Sinamics frequency converter – combines numerous functions
- Output of up to 0.75 kW (for 1 AC, 200-V supply voltage) with a compact design (now 24% smaller and thus even more space-saving)
- Sinamics V20, 1 AC, 200 V, 0.12 to 0.75 kW with integrated C1 EMC filter for use in residential and business environments (the first environment)



Sinamics V20

Saves space without sacrificing what is important

With a height of 142 mm and a width of 68 mm, the Sinamics V20 is an especially space-saving solution for the control of the rotational speed of microdrives. The converter is now also available in the small sizes FS AA (with a mounting depth of 108 mm) and FS AB (with a mounting depth of 128 mm). This is Siemens' smallest frequency converter, covering a power range of 0.12 to 3 kW for single-phase AC, 200-V supply voltage, and of 0.37 to 30 kW for three-phase AC, 400-V supply voltage.

The compact and rugged Sinamics V20 can be used all over the world for applications such as pumps, fans, compressors, and conveyors, as well

as for commercial applications such as refrigerated counters, fitness equipment, and ventilation systems. It is characterized by short commissioning times and easy operation. The "Keep Running" mode enables uninterrupted operation even in areas with unstable grids. An improved cooling design and coated circuit boards offer a high level of electrical and mechanical ruggedness for use in harsh environmental conditions. An integrated Modbus/USB interface is available to connect the frequency converters to a higher-level control system such as a Simatic S7-1200. ■

➔ siemens.com/sinamics-v20

Sinamics G120 power modules

Higher power density

The second generation of Sinamics G120 inverters features the new PM240-2 power module and thus has higher power density. Depending on the application, the module can be combined with the appropriate control unit and optional components. The revised series of inverters is available in three voltage ratings: 200 V, 400 V, and 690 V. Thanks to the integrated DC link inductor, sizes D – F are now even more stable against mains power variances. Depending on the requirements, the user can choose between different

sizes with outputs of 0.55 to 250 kW. The devices can be mounted side by side without derating, which reduces the required space and the cost of building control cabinets. To reduce the heat in the control cabinet, the Sinamics G120 is equipped with the push-through cooling system. On the mains and motor side, it has optimized terminals to make commissioning and servicing easier. ■

➔ siemens.com/sinamics-g120



NEW FEATURES

- Higher power density in less space
- Innovative push-through cooling design
- Integrated comprehensive safety system up to PLe / SIL 3

Sinamics G120P / power extension

Significant extension of power and voltage ranges

The Sinamics G120P series is a line of inverters designed for pumps, fans, and compressors. The current module extension covers a higher power range and enables entry into the 690-V wide voltage range. The extension of the models applies to both installation devices and the cabinet series. This makes an even more flexible drive available to the industrial sector.

The modular design and catalog-based range of options for the cabinet system allow for optimal and customer-specific selection of components for each application. ■

➔ siemens.com/sinamics-g120p

NEW FEATURES

- Comprehensive power range for 400-V grids and entry into 690-V wide voltage range
- Very high efficiency (> 98%)
- Rugged design for harsh industrial applications
- Particularly easy operation and significantly reduced engineering time with TIA Portal support



Sinamics G120C – new FSAA enclosure size

Reduced space requirements without compromising power

NEW FEATURES

- Up to 32% reduction in required space compared to the predecessor size, FSA
- Extremely easy installation using the DIN standard mounting rail adapter
- 100% compatibility: no reconfiguration necessary if the product is exchanged
- Identical functions in a smaller device
- STO safety function included as standard

The Sinamics G120C combines a particularly compact size with high power density and offers a balanced mix of functionalities for a broad spectrum of applications. The new FSAA housing size is a new highlight in the power range between 0.55 and 2.2 kW. It requires less space without compromising power, and it is fully compatible with the other three sizes – FSA, FSB, and FSC. ■

➤ siemens.com/sinamics-g120c



Simotics reluctance motor and Sinamics inverter

High dynamics, high efficiency

NEW FEATURES

- Extended power range: 0.55 to 30 kW
- Power increase of approximately 70% during operation at 87 Hz
- Significantly higher efficiency than asynchronous motors with the same power rating
- Fast ramp-up and deceleration times due to low moment of inertia

Simotics reluctance motors are part of the Simotics GP/SD motor series for inverter operation. The reluctance motors are controlled by the standard Sinamics G120 inverter, which has a special vector control system for reluctance motors.

It can be easily commissioned by using designated motor codes on the nameplate. Another advantage of the highly dynamic reluctance motors is their energy efficiency: they are significantly more efficient in the partial-load range compared to asynchronous motors with the same power rating. The low moment of inertia also allows for short ramp-up and deceleration times.

Reluctance technology is used primarily in applications with pumps, fans, and compressors as well as for conveyor technology and machine building. ■



➤ siemens.com/reductancedrivesystem

Simotics DP LP100 - NEMA motors

Top performance for vertical pumps

NEW FEATURES

- Rugged construction together with high dynamics
- Bearing load capacity that is more than 175% of the capacity of standard bearings
- Compliance with the IEEE 841 and ANSI/API 610 standards
- Compliance with the strict criteria of EISA, the US government's energy-efficiency regulation

The Simotics NEMA low-voltage motors line has been expanded. It now includes the Simotics DP vertical solid shaft (VSS) motors. The motors offer rugged construction together with high dynamics for maximum performance even in the harshest environments. To meet the high demands of diverse pump applications, the bearing load capacity of the new Simotics DP LP100 has been improved and now achieves values that are greater than 175% of the capacity of standard bearings. The motor also complies with the IEEE 841 and ANSI/API 610 standards. The IEEE 841 standard defines strict requirements for

the improvement of reliability and performance of motors for the petroleum and chemical industries, while the API 610 standard proposes requirements for the construction of motors for centrifugal pumps. These workhorses not only offer reliability, high performance, and a long service life but are also highly energy efficient: the motor meets the US government's energy-efficiency regulation, EISA (Energy Independence and Security Act), one of the most stringent regulations in the world. ■

➔ siemens.com/simotics-vss



Liquid-cooled drive systems

Maximum efficiency

With the water-cooled Simotics FD motor and the Sinamics S120 cabinet modules (CM) converter cabinet system, liquid-cooled drives also benefit from the system advantages of Integrated Drive Systems (IDS): the modulation patterns of the converters are designed to accurately match the rating pulse frequency of the motors, and the motor windings are adapted to the converter output currents and voltages.

In addition, the liquid cooling of the motor and converter results in reduced space requirements compared to air-cooled systems. The heat removal in a liquid-cooled system is more accurately targeted and significantly more efficient. This allows the overall availability of the drivetrain to exceed 99% with liquid-cooled IDS – a real productivity advantage in addition to cost savings due to the high energy efficiency. Whether implemented in the steel, automotive, or process industry, in offshore installations or infrastructure facilities, liquid cooling simplifies the heat removal of powerful drives and results in better energy utilization. ■

➔ siemens.com/liquid-cooled-ids

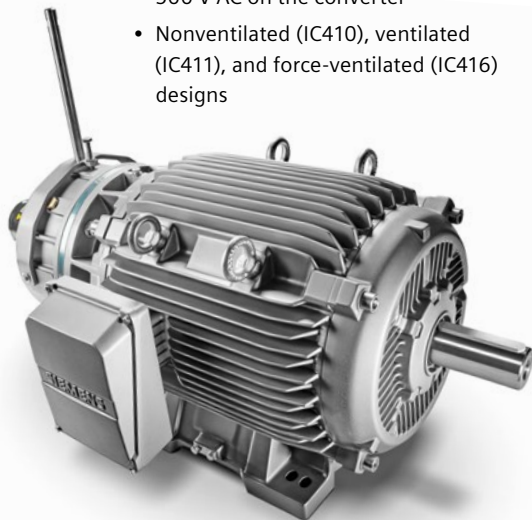


NEW FEATURES

- Compact, space-saving system solution with high power density
- Up to IP55 degree of protection as standard – for use in harsh environments
- Simotics FD: a broad range of options with different industry packages and national and industry-specific certifications
- Sinamics S120 CM liquid-cooled cabinet modules: flexibly configurable cabinet system with a comprehensive range of options, with liquid cooling of all the power electronics

NEW FEATURES

- Solution package for environments with salty air and high humidity
- Modular design with application-specific components
- Special insulation system up to 500 V AC on the converter
- Nonventilated (IC410), ventilated (IC411), and force-ventilated (IC416) designs



Simotics DP crane motors

Reliable in the sea air

Simotics DP crane motors will soon be available in combination with the Sinamics converter family. These latest-generation motors offer maximum efficiency and high availability thanks to the use of particularly robust materials, from cast iron housings to specially adapted encoders and brakes. This motor generation offers a wide range of solutions for the most diverse applications. Simotics DP crane motors have been developed for use in salty environments with high humidity. The system has been adapted to the typical intermittent duty cycles S2 or S3 (S9) for crane applications. The motors are available in power ranges from 1.8 to 481 kW (S3) and in frame sizes from 132S to 315L. Special approvals ensure that the motors are suitable for worldwide application. ■

➔ siemens.com/simotics-dp

Simotics Active Magnetic Bearing-Technology

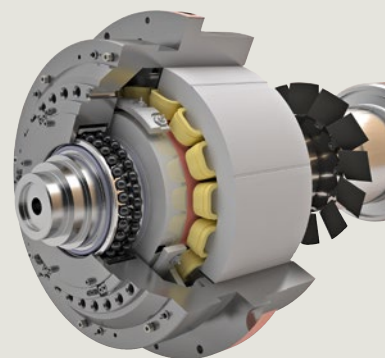
Precise, rugged, and safe

Simotics Active Magnetic Bearing-Technology (AMB-Technology), the new active magnetic bearing system from Siemens, has been developed specifically for powerful machines with large shaft diameters and high speeds, for example, high-speed Simotics electric motors and compressors. The controlled magnetic fields of active magnetic bearings keep the motor and compressor rotors centered in the bearing as a noncontact solution and thus ensure a low degree of wear. Because the magnetic bearings are oil-free, oil leakage is not a problem, even at high circumferential speeds. The machines with Simotics AMB-Technology are also suitable for operating ranges in which standard bearings cannot be used due to rotor resonances, as the electronic con-

troller in the active magnetic bearing actively compensates rotor vibrations.

Simotics AMB-Technology is based on proven and reliable Sinamics standard control and converter components from the machine tool area, where more than 500,000 of these components are sold per year. The magnetic bearing electronics are completely integrated into Totally Integrated Automation (TIA). Valuable operating data, such as bearing forces, can thus be transmitted seamlessly to a higher-level control system and create the basis for efficient online remote monitoring and operation. ■

➔ siemens.com/simotics-amb-technology



NEW FEATURES

- Oil-free design for use at high speeds, in environmentally sensitive areas, or areas with a high risk of fire
- No friction losses, resulting in reduced energy consumption
- High reliability due to proven Sinamics standard control and converter components
- Intelligent control concept that supports data-assisted preventive maintenance programs

Bipex-S elastomer coupling / Sipex metal bellows coupling

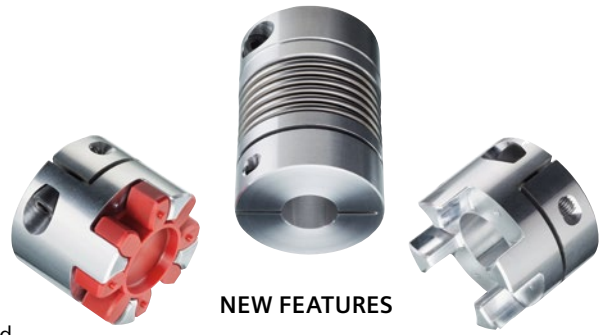
High positioning accuracy

Backlash-free couplings are the modular interface with reliable power transmission between the motor and the drive machine. They also compensate for offsets between the coupled units. The backlash-free, breakdown-resistant, and vibration-damping Bipex-S couplings are characterized by high power density and electrically insulating properties that protect from leakage currents. They enable high positioning accuracy and reduce system wear thanks to lower peak loads and less vibration. Depending on the coupling size, they are equipped with hubs made of either aluminum or steel. The damping properties can be varied with elastomer cam rings with different degrees of hardness.

The extreme torsional rigidity of Sipex couplings enables angle-preserving torque transmission and thus the highest degree of positioning accuracy.

They are maintenance- and wear-free, reduce unplanned downtimes of plants and machines, and thus increase plant availability. Depending on the types, the hubs of the metal bellows couplings are made of aluminum or steel; optionally stainless steel versions are also available. Due to the true running properties of the couplings, they are especially suited for high rotational speeds. Like the Bipex-S couplings, they require little mounting space, are easy to install, and are designed for Integrated Drive Systems. ■

➤ siemens.com/bipex-s
➤ siemens.com/sipex



NEW FEATURES

Bipex-S

- High power density
- Vibration-damping properties that protect the plant and reduce vibration
- Cam rings available in four different degrees of Shore hardness

Sipex

- Highest positioning accuracy due to angle-preserving torque transmission
- True running properties that enable use at high rotational speeds
- Good power density with low restoring forces

Elastic N-Bipex couplings

Higher torque and increased operating safety

NEW FEATURES

- Improved service life thanks to optimized cam geometry combined with high-quality elastomer material
- Torque increase of up to 20%
- Unlimited use in the temperature range from -50°C to $+100^{\circ}\text{C}$
- Suitability for applications in the chemical, environmental, and steel industries

With the Flender N-Bipex coupling, Siemens has added a new elastic claw coupling to its product portfolio. The coupling, made of high-quality nodular cast iron, is produced in 10 sizes, from size 19 to 90. In shaping the cams, this casting method produces a result that is superior to milling. Nodular cast iron couplings allow for considerably higher speeds than gray iron products and are as resistant to forced rupture as steel.

The new elastomer material developed for the N-Bipex coupling is designed for top performance and is available in three Shore hardnesses. In terms of the criteria relevant to the coupling function – compressive strength, wear resistance, dimensional stability, and plasticity – optimum values are

achieved. In combination with the optimized curved design, the torque can be increased by 10% to 20% depending on the system size, while at the same time keeping the restoring forces lower than those of previous solutions. This makes applications with dynamic loads possible while maintaining a high level of operating safety. In a temperature range of -50°C to $+100^{\circ}\text{C}$, the elastomers can be used without any temperature-related limitations to the rated torque. Taking all features into account, the N-Bipex couplings with a modified cam geometry and the superior material properties of the elastomers provide a service life that is longer than that of conventional solutions. ■

➤ siemens.com/n-bipex



Sinema Remote Connect

Efficient and secured remote access

The Sinema Remote Connect server application enables remote maintenance of machines and systems as well as other remote applications such as condition monitoring. Because it provides secured, worldwide remote access for maintenance to often identical machines in different locations, it is suitable for use in machine building, in particular for series production.

The machines can be connected to Sinema Remote Connect using mobile networks, DSL, or existing private network infrastructures. For this purpose, users can rely on a wide range of industrial routers from the Scalance series, such as the Scalance M876-4 LTE mobile wireless router. This type of router supports virtual private network (VPN) security mechanisms such as OpenVPN. When using OpenVPN, Scalance routers can be easily parameterized via Sinema Remote Connect with an autoconfiguration interface.

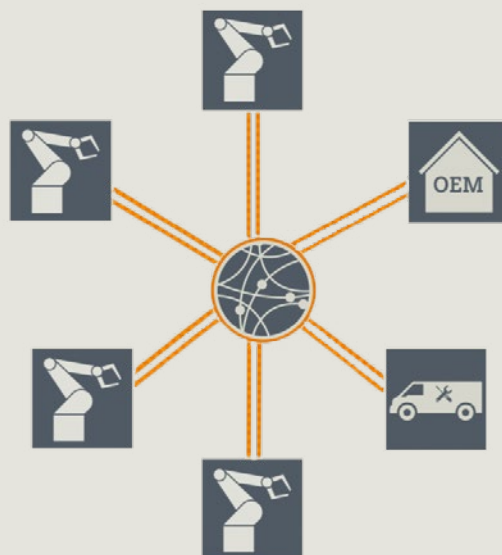
With an OpenVPN client (e.g., a Sinema Remote Connect client), service engineers can establish a secured connection to Sinema Remote Connect. Network participants are activated or locked manually. This allows the plant operator to maintain control of all accesses to the company network at all times. Sinema Remote Connect can run on a host computer in a conventional physical environment or in a virtualized environment. When using a hypervisor, the operator can access different applications in parallel on a shared hardware platform.

Sinema Remote Connect hosted as managed appliance in virtual environments

In addition to the numerous advantages of virtualized systems, such as greater flexibility and higher availability, maintenance and support services can also be provided more efficiently, which unlocks additional optimization potential for the user. For this purpose, Siemens offers a comprehensive virtualization solution from a single source, based on Simatic Virtualization as a Service and the Sinema Remote Connect server. The package includes server set-up, configuration of the virtual machines and their network structure,

installation and configuration of the operating system, and ready-to-use installation of the Simatic software. Siemens provides complementary services to support the virtualized systems over their entire lifecycle: Simatic Remote Services enable secure and efficient support based on the highly available common Remote Service Platform (cRSP), while Managed Support Services pool and coordinate all support activities in connection with the virtualized host system. ■

➤ siemens.com/sinema-remote-connect



Siemens AG

Industrial communication

From the simple connection of a sensor to recording and transmitting all the quality and production data of a factory, Siemens' comprehensive range of products for industrial communication enables efficient integration of all business segments.

Simatic CP 1542SP-1 IRC based on the Simatic ET 200SP

Central control of remote terminal units

With telecontrol, operators can monitor and control automated plants from a control center. This is made possible with remote terminal units (RTUs) in process stations at different locations. The new CP 1542SP-1 IRC communications processor expands the telecontrol product portfolio with the addition of modular RTUs based on the Simatic ET 200SP Distributed Controller. Using a telecontrol protocol, the RTUs can be connected to a telecontrol control center. The CP 1542SP-1 can be connected either to a control center with TeleControl Server Basic using the TeleControl Basic telecontrol protocol, or to a control center supporting open telecontrol protocols, such as Simatic PCS 7. This can be done using the standard DNP3 or IEC60870-5-104 telecontrol protocols. The telecontrol protocol is defined by selecting the corresponding component properties during configuration. The connection

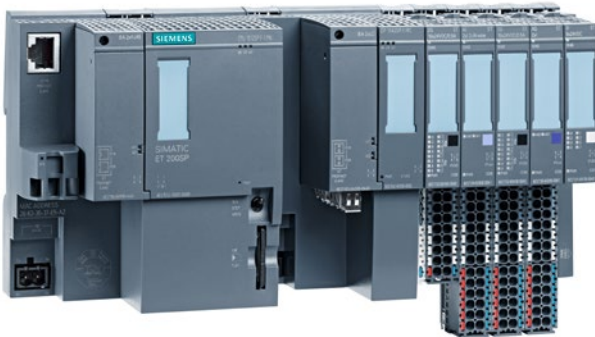
to the telecontrol control center is established using public or private communications networks (remote networks such as the Internet, mobile communications, or serial SHDSL). To connect to these networks, an external industrial router, for example, from the Scalance M series, must be connected to the Industrial Ethernet interface of the communications processor.

The CP 1542SP-1 IRC supports both cyclic and event-driven transmission of all types of data required for process control. In addition to the data transmission function, the communications processor features an e-mail function that automatically notifies service engineers of previously defined events – for example, if a limit is exceeded. For this purpose, the user selects the data that are to be transferred from the ET 200SP CPU in the Step 7 professional engineering

software of TIA Portal V14 and sets the desired communications parameters. The communications processor consistently saves all measured values with a time stamp, preventing loss of data in case of a connection failure. The CP 1542SP-1 IRC also provides extensive diagnostic options – locally by LED error indication, in the Simatic Step 7 engineering tool, or using a web server.

A typical application of RTUs based on the Simatic ET 200SP is the transmission of measured values from geographically distant locations to a control center. This is quite useful, for example, in sewage and water treatment plants, in district heating systems and pumping stations, in the oil and gas industry, for power distribution, and in transportation. ■

➔ siemens.com/telecontrol



NEW FEATURES

- Ability to benefit from the Simatic ET 200SP Distributed Controller's advantages – compact design, ample range of modules, high performance, and efficient engineering – as an RTU for telecontrol applications
- Numerous areas of application through connection to different control centers using different telecontrol protocols
- Automatic buffering of process data in case of a connection failure and easy e-mail notification
- Simple commissioning thanks to configuration without any programming

OPC UA open communications standard

Connect Simatic to mixed industrial environments

With the OPC UA industrial communications protocol, machine data can not only be transferred but also described semantically in a machine-readable way. OPC UA's semantic interoperability makes it a core element of Industrie 4.0 and the Internet of Things. As an open Industrie 4.0 standard, OPC UA plays a central role in the integration of the current Simatic programmable logic controller (PLC) generation into mixed industrial environments. In a first step, an OPC UA server was directly integrated into the Advanced Controller series and into all S7-1500 CPUs. With the resulting OPC UA Data Access, PLC data were made accessible from any device with an OPC UA client. The CP 443-1 OPC UA is the new communications processor used to connect the

Simatic S7-400 to Industrial Ethernet networks. This allows data to be made available for other participants or sent to them directly from the control rack using a standardized OPC UA interface. The communications processor can be used as an OPC UA server and/or client. As an OPC UA server, it provides data that the OPC UA clients can access via read/write mechanisms or via subscription. As an OPC UA client, it collects or writes data from or to OPC UA servers with read/write mechanisms. Communication as an OPC UA client takes place via standardized user modules. OPC UA security mechanisms are implemented to sign and encrypt the communications. ■

➔ siemens.com/simatic-net

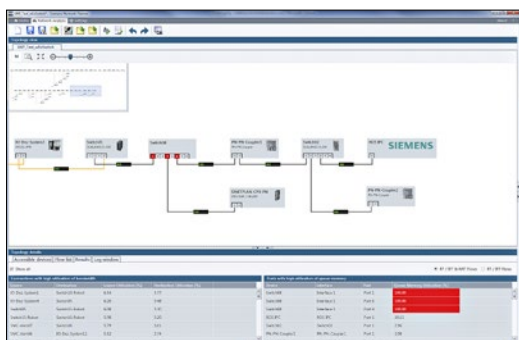


NEW FEATURES

- Open, standardized connection to HMI, SCADA, MES/ERP, or third-party PLCs
- Flexible and standardized interface as an OPC UA client thanks to PLCopen-compliant modules for communication with any OPC UA server
- Protection against unauthorized data access with OPC UA security mechanisms
- Configuration with Step 7 classic to expand existing systems (CP 443-1 OPC UA)
- Real-time communication with Profinet and open communication using OPC UA

Sinetplan

Optimizing and simulating networks



NEW FEATURES

- Planning and designing of Profinet networks through the simulation of network traffic
- Network optimization with port-granular calculation of the network load
- Increased availability through network reserves
- Transparency thanks to online scans and verification of existing systems
- Increased efficiency through the importation of the topology and Profinet traffic of existing Step 7 projects

The Sinetplan simulation tool supports developers in planning automation systems and networks based on Profinet. Sinetplan simulates and calculates not only real-time data but also non-real-time data such as standard TCP/IP communication. TCP/IP data can have a strong influence on network traffic, for example, when high-definition videos are transmitted to monitor quality. With the simulation, critical Profinet network segments with excessive network loads can be identified and redesigned as necessary. With Sinetplan,

the planned network can be optimized, network resources put to best use, and reserves set up. This helps prevent problems during commissioning and failures during live operation. At the end of the planning and validation phase, Sinetplan can create a report to make approval of the system more transparent. ■

➔ siemens.com/sinetplan

ANT793-8DL IWLAN antenna

For harsh applications

With the new ANT793-8DL IWLAN antenna, Siemens offers a rugged and reliable radio connection that is also suitable for railway applications. The strongly directional double antenna operates in the frequency band of 4.9 to 5.9 GHz and is therefore suitable for the 5-GHz license-free wireless LAN band. The rugged mounting aid supplied ensures stable wall mounting and enables multiaxis, flexible alignment into the desired radiation direction. Equipped with two N-Connect plug-in connectors, the antenna, which is resistant to shock and vibration, is connected to the active network components by means of a matching connecting cable. Thanks to the high IP66/67 class of protection, the antenna can also be used in harsh environments. ■

**NEW FEATURES**

- Double IWLAN antenna with directional characteristic and high antenna gain (14 dBi)
- Fulfillment of the highest requirements in terms of ambient conditions and fire protection
- Approval for use in confined spaces such as tunnels
- Compliance with the EN50155, EN45545-2, and EN50121-4 standards

➔ siemens.com/iwlan

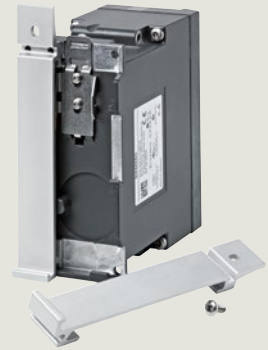
Top-hat rail adapter for Scalance products

Everything in line

Siemens offers a top-hat rail adapter for assembling products of the Scalance X and Scalance S series on the Simatic S7-1500 profile rail. The S7-1500 mounting kit consists of two mounting brackets that are attached to the back of the housing of Scalance products. The brackets can be used to hook the devices onto the profile rail and tighten them with screws. The adapter was designed for the compact metal products of the Scalance X-100,

X-200, X-300, and S-600 Industrial Ethernet and industrial security product lines. The Scalance product portfolio features network components for reliable operation in any industrial environment, a wiring system for fast preassembled connection on-site, and a reporting method for permanent monitoring of the network components. ■

➔ siemens.com/scalance

**NEW FEATURES**

- Easy assembly of Scalance products on the Simatic S7-1500 profile rail
- Suitability for Scalance X-100, X-200, X-300, and S-600

IP69 Profinet and power cables

Robust cabling

Network components for industrial use must be able to withstand harsh ambient conditions. With the new Profinet and power cables, devices in the food and beverages industry can be connected in accordance with the high IP69 class of protection. With a sheath made of FEP (fluorinated ethylene propylene), the cables are resistant to high pressure, steam cleaning, and chemical agents. The weatherproof cables are also resistant to microbes and can be cleaned

with many different substances. The cables are suitable for all components featuring M12 connectors, for example, the Scalance X208PRO and Simatic ET 200eco PN. In order to use them in environments requiring IP69 class of protection, not only the cables but also all active network components must have IP69 approval or be installed in an IP69 housing. ■

➔ siemens.com/fastconnect

NEW FEATURES

- Robust, flexible, and torsion-resistant design
- Availability by the meter or as ready-made M12 plug-in cables (PN M12 D-coded, Power M12 A-coded)
- Compatibility with existing components



Industrial Networks Education

Training for success

Digitalization is a hot topic in industry, as the merging of the virtual world and the real world promises considerable opportunity for growth. To successfully move toward the “future of industry,” companies need powerful industrial networks that are based on time-tested standards – and the know-how to design, implement, and connect these networks to a corporate network. With Industrial Networks Education, Siemens offers a targeted training program on industrial networks.

Based on the three pillars of switching and routing, security, and wireless LAN, the program provides participants with comprehensive network knowledge and, on request, a certificate to document the completion of the course. Comprehensive training is the key to success and to a long-term competitive advantage. ■

➔ siemens.com/industrial-networks-education

Ruggedcom VPE1400

Intelligence at the network edge

As part of the development of the Ruggedcom portfolio, the Ruggedcom RX1400 router has been enhanced with the Ruggedcom VPE1400 (Virtual Processing Engine). The virtual machine environment can be used in numerous industries, especially those requiring rugged hardware and reliable communications, such as electric power, transportation, and oil and gas. This virtual machine environment enables customers to run their own Linux operating system and applications on the RX1400 at the network edge. For example, an application running on the VPE1400 could allow data gathered during traffic or energy monitoring operations to be preprocessed in the RX1400 before being transmitted to a control center. This not only reduces the volume of trans-

mitted data but also helps increase the stability, efficiency, and performance of the network.

Applications running in the VPE1400 environment are safely separated from the Ruggedcom ROX operating system, while still having full access to the RX1400’s network, LTE, and serial interfaces. Used in combination with the new Ruggedcom ACE (Application Connectivity Engine), the virtual machine environment can also provide multiprotocol SCADA communication to devices from various manufacturers, making these devices accessible to applications running in the VPE1400. ■

➔ siemens.com/kvm-edge-router

NEW FEATURES

- Rugged, cost-effective hardware platform for third-party applications
- Intelligence at the network edge
- Integrated API suite for multiprotocol device communication
- Standard Linux-based development platforms



Ruggedcom RSG920P

Big bandwidth for small spaces

The Ruggedcom RSG920P, a high-port-density Industrial Ethernet switch, is designed to operate in harsh environments with widely varying climatic and environmental conditions, such as transportation systems and oil and gas applications. With 20-Gigabit Industrial Ethernet ports, the RSG920P is suitable for applications that require high bandwidths and is designed to easily accommodate future network expansions. Four small form-factor pluggable (SFP) slots provide flexibility in uplink distances and bandwidth options supporting Gigabit and Fast Industrial Ethernet fiber SFPs. The small form factor of the RSG920P provides the capacity of a 19-inch switch and enables deployment in space-limited cabinets. Storing application data, firmware, and device configuration data for commissioning and field maintenance is simple with the microSD card slot. With four Power

over Ethernet (PoE) interfaces supplying up to 120 W (30 W per port) of power, the RSG920P can accommodate various PoE devices such as pan-tilt-zoom (PTZ) cameras, intercom devices, Wireless LAN access points, and Bluetooth sensors. The RSG920P helps meet the growing demand for Industrial Ethernet in roadside and wayside cabinets by eliminating the need for multiple switches. Customers can reduce cabling costs and simplify camera, radio, and peripheral device connectivity by supplying power and Industrial Ethernet over one cable. The Rugged-com RPS1300 is the power supply companion of the RSG920P, capable of providing enough power for all four PoE ports simultaneously, even when operating at 30 W per port. ■

➤ siemens.com/rsg920p

**NEW FEATURES**

- Rugged Layer 2 switch with high capacity
- Power supply companion for up to four PoE devices
- Supply of power and Industrial Ethernet over one cable
- Compact dimensions of 154 x 152 x 176 mm

**Ruggedcom RMC8388**

Compact time converter for harsh environments

The Ruggedcom RMC8388 is a cost-effective time converter designed to operate in harsh environments with widely varying ambient conditions. Withstanding extreme temperature ranges (−40°C to +85°C) as well as vibration and shocks, the device offers maximum reliability for electrical power applications. The RMC8388 can convert the modern Precision Time Protocol IEEE 1588v2 to the legacy IRIG-B (Inter-Range Instrumentation Group) time codes or PPS (pulse per second). The RMC8388 enables the use of legacy IEDs (intelligent electronic devices) within modern Industrial Ethernet networks without the need to maintain a separate network for time synchronization.

The compact form factor means the RMC8388 requires only minimal space in cabinets. It also reduces capital expenditure by enabling cost-effective time synchronization to existing non-IEEE 1588-capable IEDs. Legacy IEDs can be integrated into modern Industrial Ethernet-based networks. The extended service life enables users to continuously modernize their networks. The RMC8388 also reduces high maintenance costs on legacy coax cabling by instead using standard Industrial Ethernet cabling for both communication and timing purposes. ■

➤ siemens.com/rmc8000

NEW FEATURES

- Time conversion between IRIG-B and IEEE 1588v2
- Cost-effective device for the electrical power market
- Use of legacy IEDs within modern Industrial Ethernet networks



Siemens AG

Simatic RF680A and RF650A

Significantly improved readability

Two new antennas have been added to the Simatic RF600 portfolio. The adaptive Simatic RF680A high-end antenna achieves the highest reading rates, even under challenging circumstances, and in combination with the RF650R reader, the new Simatic RF650A antenna is the ideal choice for a cost-effective logistics system.

The new radio-frequency identification (RFID) devices of the RF600 series, which Siemens launched a year ago, impress users with their easy commissioning thanks to the user-friendly interface with integrated tools. The operator can easily determine the system's response performance and align the antennas. In maintaining an overview of the system's RF situation at all times, the operator can also perform quick diagnostics in case of an error, reducing downtimes and increasing plant availability. And last but not least, the new devices fulfill the highest demands in terms of readability.

Automatic antenna control

This quality is most pronounced in the Simatic RF685R UHF reader with an integrated adaptive antenna, whose

polarization the user can adapt to different ambient conditions (operating distance, tag positioning, reflections). An important advantage of the adaptive antenna is its automatic control by means of the reader. Based on special algorithms, the reader automatically selects the right antenna configuration for each individual read operation – the operator does not have to make a selection. This not only saves time during commissioning but also increases reliability, in particular under difficult conditions or in an environment that is highly reflective to radio signals.

On the safe side

With the new adaptive Simatic RF680A antenna, these special characteristics are now also available to the RF650R and RF680R UHF read/write devices. These devices have connectors for four external antennas, allowing the implementation of four read stations with the new antennas. The polarization of the RF680A antenna is just as variable as that of the RF685R reader's antenna. The great advantage: with the Simatic RF680A, operators are on the safe side, as the question of whether to use linear or circular polarized antennas sometimes has not yet been decided in the planning stage of a plant. This reduces the planning effort and simplifies spare parts stocking. Another plus: the large multicolor LED clearly indicates the antenna's activity as well as tag and error recording. This allows the user to instantly check whether the system is operating as expected.

The second new product, the Simatic RF650A antenna, is the ideal choice for a cost-effective logistics system, in combination with the RF650R read/write device. Both antennas fulfill the requirements of the high IP65 class of protection and have the same compact dimensions (198 x 198 x 60 mm). In addition, they are compatible with the Simatic RF650R, RF680R, and RF685R read/write devices. Thanks to their broadband operating frequency (865–928 MHz), they are suitable for use all over the world. ■

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

Industrial identification

Simatic Ident enables gap-free traceability of commodity flows in industrial processes. Depending on the application, radio-frequency identification (RFID) solutions based on radio waves or optical identification systems are used.

Simatic RF170C

Connecting the identification system to the distributed I/O

Using the Simatic RF170C communication module, up to two Simatic identification systems can now be connected to the Simatic ET 200pro distributed I/O system. The read/write devices of all RFID systems, Simatic MV400 optical readers, and Simatic MV320 and MV340 handheld readers as well as third-party systems can be connected to the RF170C by means of a universal RS232/RS422 interface and the Freeport protocol. The new communication module is particularly suitable for machine building, conveyor technology, and assembly lines in the automotive industry as well as for small assembly lines.

The Simatic RF170C is equipped with two reader interfaces. With an Ident library, the new module can be integrated into the TIA Portal engineering framework, where it offers easy-to-configure functions. Any serial device can be connected to the Simatic RF170C communication module using an RS232/RS422 interface and can be integrated using the Freeport protocol. Suitable function blocks are available for this task. The Simatic MV320 and MV340 handheld readers are connected to the new Simatic RF170C communication module with a coiled cable. The coiled cable fulfills the requirements of the high IP67 class of protection, making it suitable for use in harsh environments. It also allows for a large operating range. ■

➔ siemens.com/rfid

NEW FEATURES

- Connection of the Simatic Ident system with the ET 200pro distributed I/O system
- Support for all Simatic RFID read/write devices, MV400 optical readers, and MV320 and MV340 handheld readers
- Easy configuration through integration into TIA Portal



New 3VA molded case circuit breaker

Fit for the US market

Siemens has enhanced its 3VA molded case circuit breaker portfolio. The tried-and-tested 3VA2 molded case circuit breaker with electronic overcurrent release now also covers higher-rated currents of up to 1,000 A, while the new 3VA versions manufactured according to the American standard with UL approval comply with both the UL and IEC standards.

North America is a significant market for plant and machine manufacturers. Country-specific standards must be considered, and machines and plants must be manufactured according to the UL standard if they are to be sold in the North American market. UL stands for Underwriters Laboratories, an independent organization that tests and certifies the safety of products. Therefore, Siemens is complementing its current IEC portfolio of 3VA molded case circuit breakers with versions that not only comply with the North American standards but can also be used in the IEC market. Whether the products are used for filling lines, production machines, elevators, or conveyors, machine manufacturers can now choose between the IEC version and the UL version based on who the end customer is. Both series of molded case circuit breakers are handled identically, for example, when installing accessories.

Modular system in accordance with North American standards

The modular system available from fall 2016 includes numerous basic units and a wide range of accessories geared to the UL market. Among other things, there are a wide variety of internal accessories to extend the functionality and many different connection methods and manual operators with a handle or a Bowden cable (Max-Flex). The



substantial amount of CAX data keeps the engineering effort to a minimum for all components. Users can access all product data, such as 3D graphics or EPLAN Electric P8 macros, within seconds with the CAX Download Manager.

New additions to the IEC portfolio

In order to offer even more flexibility to plant and control cabinet manufacturers in the industry sector, Siemens has added a new size of 3VA2 molded case circuit breakers for rated currents of up to 1,000 A to its IEC portfolio, which until now supported rated currents of up to 630 A. In addition, the 3VA2 molded case circuit breakers have a measuring function that can be directly integrated into the switch and an optional communications interface. This makes it possible to record data such as current, voltage, and consumption levels and transmit them to higher-level control systems. As a result, the 3VA2 molded case circuit breakers increase plant transparency and contribute to higher plant availability. ■

➔ siemens.com/3va



Sivacon 8PS LR system

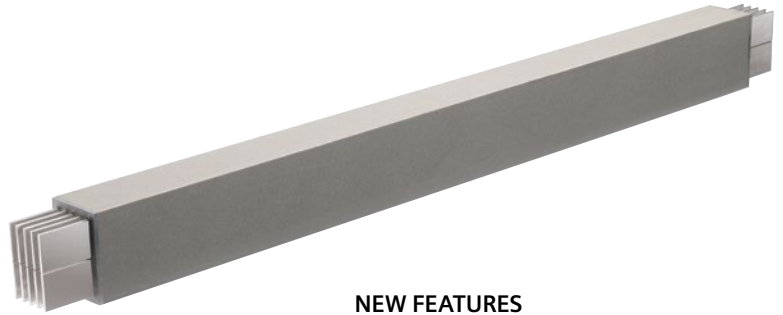
Safe under all circumstances

The fully encapsulated LR busbar trunking system from the Sivacon 8PS portfolio with IP68 degree of protection allows safe and reliable power transmission in a broad current bandwidth of 400 A to 6,150 A. Thanks to its UV-resistant surface, it can be installed outdoors, for example, to connect a transformer located outside with the LI and Sivacon S8 switchboard inside the building. The design verified adapter element serves to transition from LR to LI.

The LR busbar trunking system can be used just as safely in areas with a corrosive atmosphere, for example, in the production area of a petrochemical factory. It is installed by making an electrical connection using a terminal block and then additionally

encapsulating the joint with a two-component epoxy resin. Siemens provides all the components, including the casting moulds. Once the encapsulated joint has hardened, the permanent high degree of protection is ensured and the electrical properties will not change, even if the system is used in a harsh environment. Using angles, connectors, and T-pieces, the LR system can be perfectly adapted vertically or horizontally to the structural conditions. It is also resistant to fire for up to 180 minutes in accordance with IEC 60331. It can be connected to subdistribution systems with the space-saving switchboard connection of the LR system. ■

➤ siemens.com/busbar

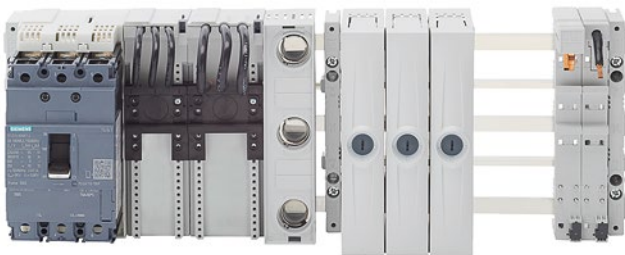


NEW FEATURES

- Broad current bandwidth of 400 A to 6,150 A
- High IP68 degree of protection for outdoor use and use in corrosive or saline environments
- Design verified connection to the Sivacon S8 low-voltage main distribution board or LI and LD systems
- Easy and space-saving installation

8US compact busbar system

More space in the control cabinet



NEW FEATURES

- Particularly compact design, thus requiring less space than other busbar systems
- Compliance with the clearance and creepage distance requirements set forth by UL 508
- Possible expansion to an IEC-compliant five-pole busbar system

With a busbar center-to-center distance of only 60 mm and a maximum height of 160 mm, the 8US compact busbar system from the Sentron portfolio is suitable for compact applications in distribution systems of up to 360 A. Another key advantage: the 8US compact busbar system can be combined with basic accessory devices of up to 400 A. Thanks to the openings in the busbar support, it is possible to combine three-pole and five-pole versions. Compact adapters for 3VA10/11 molded-case circuit breakers, as well as universal 18-mm-wide single-pole adapters for circuit breakers with a rated current of up to 63 A, are also available as accessories. The compact busbar system complies with the clearance and creepage distance requirements set forth by UL 508. ■

➤ siemens.com/lowvoltage

Energy management

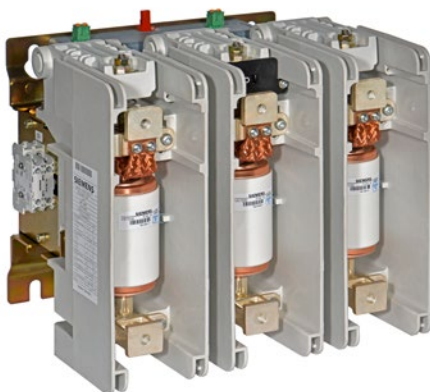
In industrial plants or buildings, power outages can have expensive consequences. From control systems to power sockets, Siemens offers a comprehensive portfolio for Totally Integrated Power worldwide.

3TM vacuum contactor

Safe switching

The new 3TM vacuum contactor is used for operative switching of currents in the medium-voltage range. It impresses with its flexibility, as it is available as a single-pole, two-pole, or three-pole version and can be installed in various positions. The modular design and individual adjustment of the distance between pole centers make it highly adaptable. With the new controller, several contactors can be switched in series, for example, in reversing circuits, reverse operation, and other applications. The outer dimensions are identical to those of the 3TL6 vacuum contactor, so installation compatibility is guaranteed. The rugged unit can withstand extreme mechanical stress caused by, for example, earthquakes and can be used at altitudes of up to 5,000 m. ■

➔ sie.ag/1Viplnu



NEW FEATURES

- Serial switching of several contactors with the new controller
- Particularly rugged design for demanding applications
- Variable distances between the pole centers (according to the customer's request) for easy plant integration

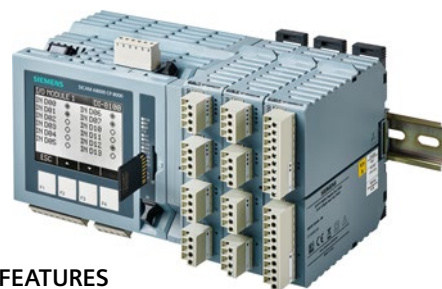
Sicam A8000 series

Monitoring, control, automation

Sicam A8000 series devices can be used for applications including distribution system automation, connecting renewable energy systems (wind, solar, hydro), and railway power supply as well as for industrial purposes. Customer requirements such as IT security, scalability, flexible communication, and design for narrow installation spaces and harsh environments were taken into account when the Sicam A8000 was developed. The new communications processor models and expansion modules offer modular, scalable solutions for all

power requirements. The slim modular design (30-mm width) of the Sicam A8000 takes up less space, and with the standard protocols (IEC 61850, IEC 60870-5, DNP3.0 serial/TCP, Modbus RTU/TCP) it can be easily integrated into existing communications infrastructure at any time. The Sicam A8000 series now features a new, intuitive engineering interface for easy parameterization – Sicam Web. The tried-and-tested Sicam Toolbox II will also continue to be available. ■

➔ siemens.com/sicam-a8000



NEW FEATURES

- Fulfillment of grid cybersecurity requirements
- Integrated GPRS module
- Increased EMC immunity as per IEC 60255-27 5 kV
- Intuitive engineering in the web parameterization tool
- Automation functions



NEW FEATURES

- 24-kV rated voltage
- 25-kA short-circuit breaking current

Sion 3AE5 24-kV vacuum circuit breaker

Maintenance-free, type tested

The series of compact Sion 3AE5 vacuum circuit breakers for air-insulated medium-voltage distribution systems has been complemented by a version for a rated voltage of 24 kV with a rated short-circuit breaking current of 25 kA. With this new device, the requirements for rated voltage in the automotive industry in particular can be fulfilled. Like the rest of the circuit breakers in the Sion series, the new version is type tested according to IEC 62271-100 and offers 10,000 maintenance-free operating cycles as standard. ■

➔ siemens.com/sion

MindSphere – Siemens Cloud for Industry

The basis for new digital business models

MindSphere – Siemens Cloud for Industry is a cloud platform for the analysis of large volumes of data. Designed as an open ecosystem, the platform allows industrial companies to use it as the basis for their own digital services – for example, for predictive maintenance, energy data management, or resource optimization.

With MindSphere – Siemens Cloud for Industry, Siemens has added plant cloud services to its plant data services. The open IT ecosystem that uses the SAP HANA Cloud Platform, enables users to access the platform via open interfaces and use it for their own services and analyses. After a successful pilot phase, MindSphere – Siemens Cloud for Industry was made available to new customer groups. In particular, machine and plant manufacturers can use the platform to monitor their worldwide machine fleet for service purposes and to reduce downtimes. This allows them to offer new business models, such as selling machine hours. MindSphere is the basis for data-driven services by Siemens, such as the predictive maintenance of machine tools (machine tool analytics) or drives (drivetrain analytics). For now, the platform is only available as a beta release, as it is continually being improved. By extending the platform to plant cloud services, Siemens is driving the digitalization of industry. In this context, MindSphere – Cloud for Industry is an important component of the Digital Enterprise strategy.

Secure collection and transmission of machine and plant data

For the manufacturer-independent connection of machines and plants to MindSphere, Siemens offers the MindConnect Nano, which has been optimized based on pilot phase experiences. In the future, additional options for establishing a connection to



MindSphere will be provided, including via a software development kit or software agent, or by integrating it into Simatic.

➔ siemens.com/mindsphere



NEW FEATURES

- Manage Security for continuous monitoring of implemented security measures
- Use of the Cyber Security Operation Center for the protection of various industry sectors and Siemens' own infrastructure

Industry Services

Siemens offers a comprehensive range of product-, system-, and application-related services throughout the entire lifecycle of machines and plants – from planning to modernization.

Plant Security Services

Comprehensive protection from cyberattacks

Siemens' Plant Security Services portfolio has been enhanced with the addition of some new offerings and now features a comprehensive range of services enabling the development, implementation, and maintenance of a defense-in-depth strategy – a far-reaching strategy that addresses all aspects of potential network attacks and unauthorized access. The portfolio focuses on three main service offerings: Assess Security, Implement Security, and Manage Security.

Assess Security consists of three assessments that guarantee transparency within an automation plant by means of evaluation. In this step, the plant is analyzed together with the customer to identify weaknesses in critical components and to carefully examine the entire process. Implement Security then provides the fundamental service products to execute a defense-in-depth strategy. The implementation team installs systems that recognize attacks and are able to repel them, and integrates measures that make it difficult for unauthorized parties to introduce

viruses and malware undetected. Manage Security has now been added to the implementation services, enabling the continuous monitoring of and regular updates to automation plants.

The system relies on Siemens' Cyber Security Operation Centers (CSOCs), of which there is one in the United States and, since February 2016, a second one in Europe. Security analysts in these centers monitor possible weak points and threats worldwide in order to provide early warnings and alarms. If an increased risk is recognized, CSOC defines and delivers the appropriate proactive protection measures. In the event of a security incident in a plant, CSOC coordinates the root-cause analysis and recommends adequate countermeasures. Depending on the effect the incident may have on the plant or the business, remedial actions are carried out either automatically or by a security expert on-site. ■

➤ [siemens.com/plant-security-services](https://www.siemens.com/plant-security-services)

Factory Automation Services

Increasing plant availability

In addition to the efficient use of resources, high availability of machines and plants is a crucial success factor in the manufacturing industry. While the average plant availability is 80%, top enterprises achieve more than 97% and thus secure their competitiveness. The key is to provide reliable support and service to restore plant functionality as quickly as possible, complemented by comprehensive preventive maintenance and continuous optimization. This is exactly what the Siemens Factory Automation Services portfolio offers.

The service portfolio includes Break Fix Services as well as Prevent and Optimize Services, which can be combined in service contracts according to the customer's specific needs and requirements and the automation components used. The result is assured plant availability and operational safety at an optimized and predictable cost.

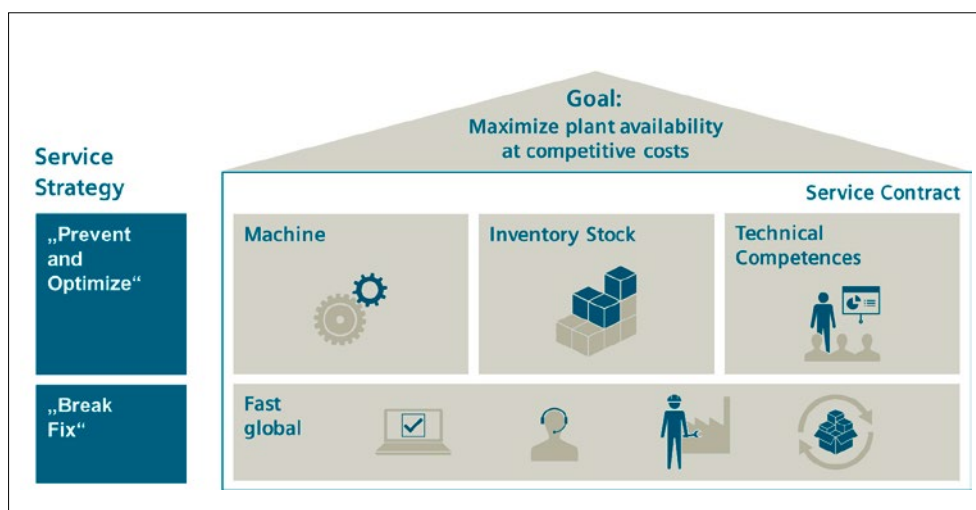
Break Fix Services help plant operators restore the required functioning of

their machines and plants as quickly as possible in the event of unexpected failures. Online Support is available around the clock and serves as a point of contact for technical information on Siemens Industry products, systems, and services and also as a central access point for advanced services and assistance by Siemens experts. Technical Support provides expert responses to all technical questions and inquiries regarding products and systems – including during the configuration and commissioning phases. More individual services are available as well. With a global network of service and repair centers and a reliable spare parts supply, Siemens helps reduce plant downtimes.

Prevent and Optimize Services minimize unscheduled downtimes through comprehensive preventive maintenance and unleash hidden potential through continuous optimization of machines and plants. Lifecycle Information Services enable systemwide transparency by providing the latest information on the product's lifecycle at regular intervals,

along with recommended actions and suitable services. Simatic Migration Services help enterprises future-proof their machines by upgrading to current Simatic technologies, which also increases plant availability and extends the lifespan of machines and plants. State-of-the-art Simatic technology and network infrastructure enable horizontal and vertical data integration in communication, from the enterprise resource planning (ERP) system to the field level. As a result, relevant information is available throughout all plants at any time and forms the basis for Industrie 4.0. The portfolio is rounded off by optimized inventory stock and spare parts management with Asset Organization Services, improved technical skills of employees through standard and customer-specific training courses, and optimized plant maintenance through consulting or taking over the entire production-site maintenance tasks by Siemens' Integral Plant Maintenance. ■

➔ siemens.com/fa-services



NEW FEATURES

- Break Fix Services**
 mySupport products available in Online Support: Creation of a customized product list to make notifications, information searches as well as downloads and services more efficient
- Prevent and Optimize Services**
 Simatic Migration Services: Reliable modernization, perfectly aligned with the customer's needs, timeline, and budget; Extension of machine lifespan, reduced unplanned downtime

Retrofit for Integrated Drive Systems/Energy Performance Contracting

Optimizing drive applications



Siemens AG

Enhancing competitiveness by increasing productivity is one of the greatest challenges in industry. In the drives sector, Siemens supports its customers with various service measures that are achieving exactly this objective: with Retrofit for Integrated Drive Systems and Energy Performance Contracting.

Integrated drive systems need to run safely and reliably under harsh conditions for many years, despite being subject to extreme wear and tear. Retrofit for Integrated Drive Systems can minimize the risk of unscheduled plant downtime and reliably reduce the rising maintenance costs associated with advancing years of use and further increase plant availability. Siemens offers tailored solutions for retrofits, from modifying, upgrading, and replacing individual components to implementing complex complete retrofit projects. Some applications such as pumps, fans, and compressors with inefficient controls often have energy savings potential of up to 30%.

By identifying these potential efficiency gains, the retrofit can be funded from the savings, plus operating costs can be reduced.

This is where Energy Performance Contracting, which optimizes drive applications in a four-step process, starts. Step one is to evaluate the drive applications and recommend an action package coupled with a savings promise. Step two is to analyze and design these measures in detail. Exact consumption measurements are carried out to define the baseline and the amount of guaranteed savings. If promised savings do not initially appear achievable, the customer can stop the project at no charge. In step three, Siemens will implement the optimization measures. At project handover, the actual savings achieved will be measured and verified and compared with the baseline. If the savings have not been achieved, the customer receives compensation. To guarantee cost savings in the future as well, Siemens

will maintain all drive systems at regular intervals and check the energy savings. ■

➤ [siemens.com/retrofit-ids](https://www.siemens.com/retrofit-ids)

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

NEW FEATURES

- **Retrofit for Integrated Drive Systems**
 - Higher productivity thanks to reduced downtime
 - Long-term supply of spare parts, plus simplified spare parts management
 - Comprehensive upgrades to the latest standards
 - Improved energy efficiency due to the holistic approach
- **Energy Performance Contracting**
 - Up to 30% savings without capital investments
 - No risk thanks to performance guarantee

Sitrain courses for TIA Portal

More efficiency in factory automation

Training

Sitrain's training courses offer expert know-how and practical knowledge for the entire range of products for the industry.

The Sitrain course portfolio offer reflects the interaction of Siemens components in production facilities. The training content is coordinated across all products for Simatic S7-1500 and S7-1200 in TIA Portal, with special emphasis on monitoring and control, motion control, industrial communication, and safety technology.

Efficient automation starts with efficient engineering. The professional Siemens training courses offer the necessary skills to help users achieve this efficiency.

• Sitrain newcomer training and courses on special topics

In the Simatic S7-1500 service and programming training courses, participants learn how to safely and efficiently plan, realize, and operate solutions from the start. The advanced training courses teach skills on special topics, with the objective of realizing optimum and cost-effective solutions for customers' plants.

• Sitrain retraining courses

The retraining courses focus on hardware and software functions and on migration options, all based on knowledge of the classic Simatic world. This basis enables a faster, more efficient change from the classic Simatic world to Simatic S7-1500 and WinCC in TIA Portal.

• Sitrain newcomer training on the Simatic S7-1200

In the Simatic S7-1200 training courses, participants learn how to use the Simatic S7-1200 with other devices for monitoring and control. In addition, special attention is paid to complex hardware and software diagnostic functions, as well as the integrated technology functions of PID controller and drive functions. ■

➤ siemens.com/sitrain-tiaportal

Participants in the various Sitrain training courses learn about the many possibilities that TIA Portal has to offer

	Programming language	Human Machine Interface	Motion	Industrial communication	Safety
Simatic S7-1500 service and programming qualification	Level 1: Simatic service 1 (TIA-SERV1) or Simatic programming 1 (TIA-PRO1)				
	Level 2: Simatic service 2 (TIA-SERV2) or Simatic programming 2 (TIA-PRO2)				
	Level 3: Simatic service 3 (TIA-SERV3) or Simatic programming 3 (TIA-PRO3)				
Courses for special topics	Simatic programming with S7-GRAPH (TIA-GRAPH)	Simatic WinCC on the machine level (TIA-WCCM)	Sinamics G120 Parameterizing, Commissioning (DR-G12-PM)	Profinet with Industrial Ethernet (IK-TIAPN)	Safety norms and standards (ST-FASAFN)
	Simatic programming with S7-SCL (TIA-SCL)	Simatic WinCC SCADA (TIA-WCCS)			Simatic safety programming (TIA-SAFETY)
Retraining courses	Level 2: Simatic system retraining course for Simatic S7-1500 (TIA-SYSUP)				
		Simatic WinCC SCADA retraining course (TIA-WCCSUP)			
Simatic S7-1200 system courses	Simatic S7-1200 basic course (TIA-MICRO1)				
	Simatic S7-1200 advanced course (TIA-MICRO2)				

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