SIEMENS
Ingenuity for life

product news

Innovations for the
Digital Enterprise

November 2018

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Primed for digitalization with Control perfection

Innovation of the complete Sirius portfolio 45

Totally Integrated Automation

Digital Enterprise – implement now!

Comprehensive digitalization of all processes provides a lasting competitive edge thanks to increased flexibility, efficiency, and quality. It offers new opportunities for added value, innovative business models, and forward-thinking forms of collaboration.

The Digital Enterprise provides the technical prerequisites for implementing the Industry 4.0 concept: connecting the virtual and the real world of production along the entire value chain, based on in-depth industry knowledge and unique expertise in the areas of electrification, automation, and digitalization. Take full advantage of these opportunities and join us on the path to a successful future.

TIA Portal makes it possible to create the digital twin of a real application by combining the simulation models of the control system and mechanical system. This allows users to simulate and validate the whole machine at the PC. This helps to avoid unplanned machine behavior that can quickly result in delays and increased costs.

Cloud-based solutions allow users to analyze production data and optimize processes. A number of new apps for

MindSphere, the cloud-based, open IoT operating system from Siemens, enables more efficient plant operation.

The next logical addition to this is Edge computing, which can be used for local or central processing of production data. Functionality, intelligence, and data are no longer stored exclusively on centralized server farms in the cloud. Now they can also be stored close to the data source – in the automation technology at the "edge" of the production network. The solution from Siemens – Siemens Industrial Edge – is based on tried-and-tested hardware and software combined with cloud technology mechanisms. It integrates the advantages of local and cloud-based data processing. ■

↗ **siemens.com/tia**

Siemens Industrial Edge – exploiting the benefits of the cloud directly in production

When it comes to analyzing production data to optimize processes, cloud-based solutions are very popular at the moment. Companies are challenged to find efficient and cost-effective solutions for their core task as well as for the associated processes such as update handling and IT security.

Local or central, on-site or via the Internet, in-house or through service providers – companies take different paths to collect and analyze production data and to continually improve their processes based on these data. Many are moving away from traditional local data processing, which keeps all hardware and software in the company, but entails complex and time-consuming software maintenance. They are opting for the digital path and relying on data processing and analysis based on central IT infrastructures (server farms) on the Internet in the form of cloud computing. This makes it easy to update and manage the applications, with updates being installed on all servers via a central cloud management system.

For IoT to work properly, companies need to be able to process data locally while also leveraging the benefits of the cloud:

The best of both worlds – local and cloud computing
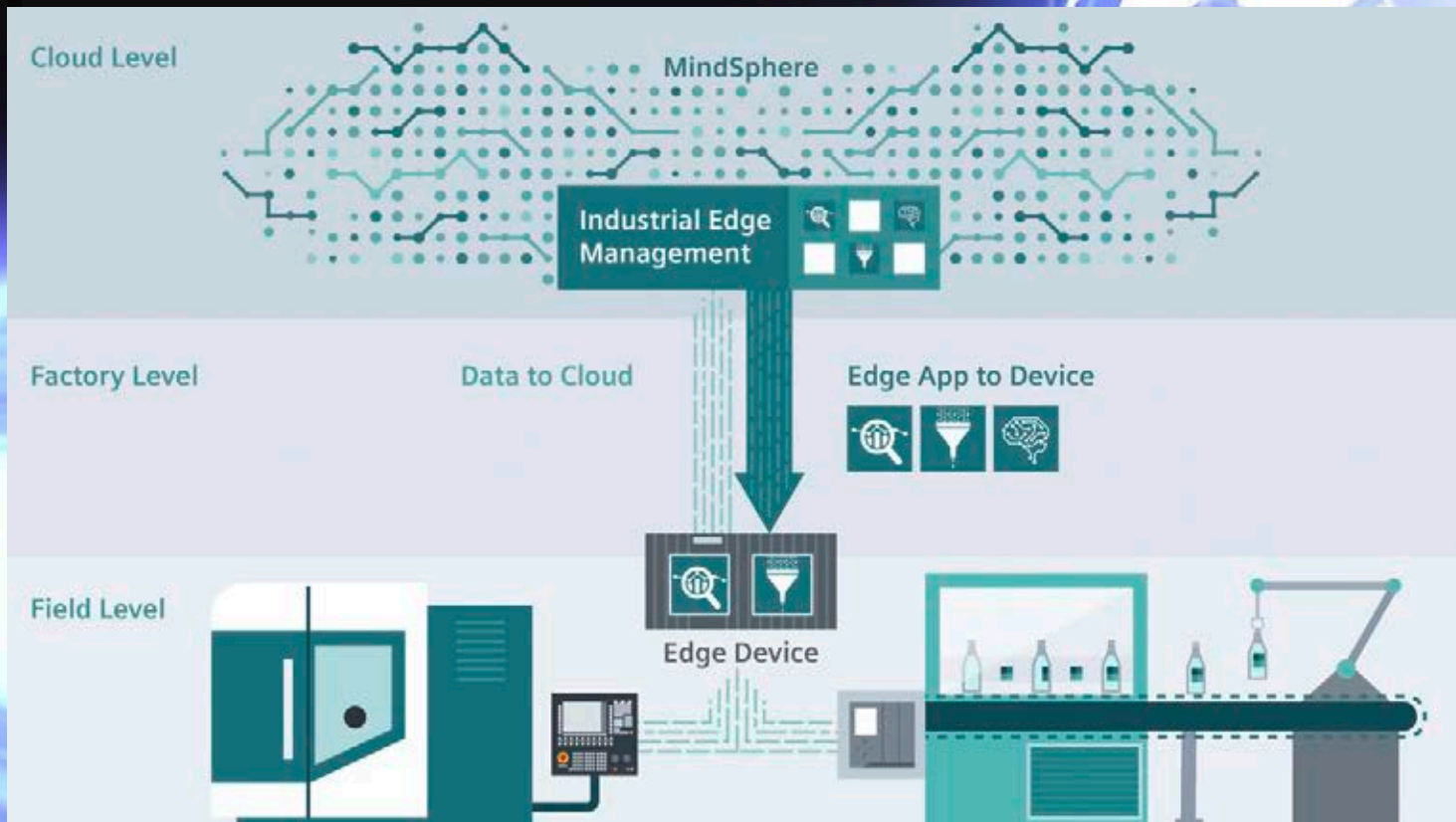
As cloud computing becomes more and more established, Edge computing is emerging as the next logical addition. It can be used for either local or central processing of production data. Functionality, intelligence, and data are no longer stored exclusively on centralized server farms in the cloud. Now they can also be stored close to the data source – in the automation technology at the "edge" of the production network. The solution from Siemens – Siemens Industrial Edge – is based on tried-and-tested hardware and software combined with cloud technology mechanisms. It integrates the benefits of local and cloud-based data processing.

The range of automation technology hardware and software for Siemens Industrial Edge consists of:

Edge management

Edge apps

Edge devices

A defining characteristic of Siemens Industrial Edge is decentralized data processing and analysis on production-level Edge devices or integrated in the automation portfolio via special applications known as Edge apps. This means short paths and minimal lag times, even for large data volumes, which enables high-performance data processing virtually in real time. The data can be stored in the automation system and preprocessed there, with only relevant information being transferred to the cloud or to IT systems. This helps protect sensitive raw data from unauthorized access. Devices and apps are still managed centrally in MindSphere, under Edge Management. This allows users to distribute system and application software to their devices as well as deliver periodic security updates to their machines. The result is a system that meets the modern twofold challenge of having open and flexible devices while maintaining a high level of IT security. ■

Edge app examples:

Analyze MyWorkpiece
The app allows users to optimize workpiece machining by capturing and analyzing high-resolution production data in the machine tool. This additional functionality for CNC machines significantly increases process and quality analytics.

Optimize MyMachining/ Trochoidal
The Sinumerik Edge application can be used to program the trochoidal milling function online directly on the machine. Edge computing allows full use of the tool and helps achieve the significantly shorter machining times now required – trochoidal milling with Edge is up to 40% faster than conventional trochoidal milling.

Coming soon
Notifier App
The plant is down? A push notification from the Simatic Edge application immediately informs the user via smartphone, smartwatch, or another mobile device.

Coming soon
Inventory App
The automation environment is becoming increasingly complex. The Simatic Edge Inventory app gives users a comprehensive overview of which automation components are being used in which machines. The list of components can be adjusted according to the user's requirements.

↗ **siemens.com/industrial-edge**

Totally Integrated Automation

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

TIA Portal V15.1

Virtual control system meets virtual machine

The most efficient way to meet the need for more rapid commissioning of production plants, while simultaneously improving production quality, is to use a digital twin. Virtual testing, simulation, and optimization save time when it comes to the actual commissioning. Faults are detected at an early stage and kept out of the real plant. This avoids unplanned machine behavior that can quickly result in delays and significant costs, while also decreasing project risks.

In TIA Portal V15.1, Simatic S7-PLCSIM Advanced can be used to create a digital twin of a Simatic S7-1500 controller. As a software suite for virtual commissioning, Simatic Machine Simulator V1.0 combines the Simatic S7-PLCSIM Advanced V2.0 virtual controller with Simit V10. Together with the NX Mechatronics Concept Designer (NX MCD) simulation software for mechatronic machine concepts, the Simatic Machine Simulator forms the basis for the virtual validation of entire machines. This makes it possible to synchronize mechatronic and control models, including simple or more complex behavioral models, and thus to simulate and ultimately validate machine-level applications.

The mechatronic model of a machine is created on the basis of the 3D data, which are kinematized in NX MCD and thus represent the physical and kinematic properties of the machine. This virtual machine model is then automated using the control-system software. To perform the validation, the real controller hardware can be used and linked to the NX MCD model via a Simit unit, or the Simatic S7-PLCSIM Advanced virtual controller can be

used. Combining the simulation models of the control system and the mechanical system results in a digital twin of the real application. This allows the machine to be simulated and validated, and preliminary optimization options to be verified, doing away with the need for real prototypes. Configuration errors are identified at an early stage and can be remedied, or even completely avoided, before the actual commissioning. During ongoing operation, comparison of the digital twin and the real plant makes it possible to respond to changes rapidly and to automatically include adjustments in upstream and downstream stages of development. ■

↗ **siemens.com/tia-portal**

**Corresponding Sitrain offer:
DI-VIRTCOM
siemens.com/sitrain-di-virtcom**

HIGHLIGHTS

- Simatic Machine Simulator, combined with NX MCD, connects control and mechanical systems, creating the digital twin of a machine
- Support for redundant and high-availability applications with S7-1500R/H CPUs
- Software units for faster, more flexible commissioning of an S7-1500 controller as part of a team
- Open, standardized communication with OPC UA thanks to support for the OPC UA server/client
- Fault-tolerant software import and CPU upload via TIA Portal Openness
- Drive integration with Sinamics S210 in Startdrive, safety acceptance test for Sinamics S120

Simatic MindApps

MindApps for cloud data

Simatic MindApps combine data from MindSphere and Simatic automation components. Users gain detailed, meaningful insights into machines and plants. They can then use these to improve service and productivity – across locations and around the world – all on their mobile device.

The Simatic Performance Insight MindSphere application provides more transparency on machines, production lines, or whole plants to support the optimization of processes and procedures. It enables comprehensive analyses and evaluations based on individual performance figures to help improve the performance of machines and plants. This allows machine and plant operators to make better use of capacities and to make detailed comparisons of machines, lines, and plants – across locations and around the world.

The Simatic Notifier MindSphere application helps shorten response times to faults and messages, thereby increasing plant availability. It alerts production or maintenance staff directly via push notifications to their smartphone if, for example, a material is running low. The application can also send a fault message directly to the machine builder. The hierarchies and notification strategies can be individually configured to ensure that employees only receive the messages that are relevant for them.

The Simatic Machine Monitor MindSphere application supports users in monitoring, maintaining, and optimizing their global fleet of machines and plants. It provides a clear view of the relevant performance indicators for the respective application. This allows for a rapid initial diagnosis and a detailed analysis of the parameters in order to improve the productivity and availability of machines and plants. Machine builders can use the application to dynamically optimize the planning of their global service operations based on current machine data. ◼

↗ **siemens.com/simatic-mindapps**

HIGHLIGHTS

- **Simatic Performance Insight** calculates and visualizes performance figures to identify optimization potential – across locations and around the world
- **Simatic Notifier** immediately sends push notifications to inform operational and maintenance employees around the world about relevant events in machines and plants
- **Simatic Machine Monitor** helps machine builders optimize the maintenance and availability of machines and plants based on current usage and status data

Profinet communications standard in conjunction with OPC UA

Integrated communications – the basis of digitalization

Industrial Ethernet …

OPC UA
on and above
the control level

PROFINET
on the field level

… one network for everything.
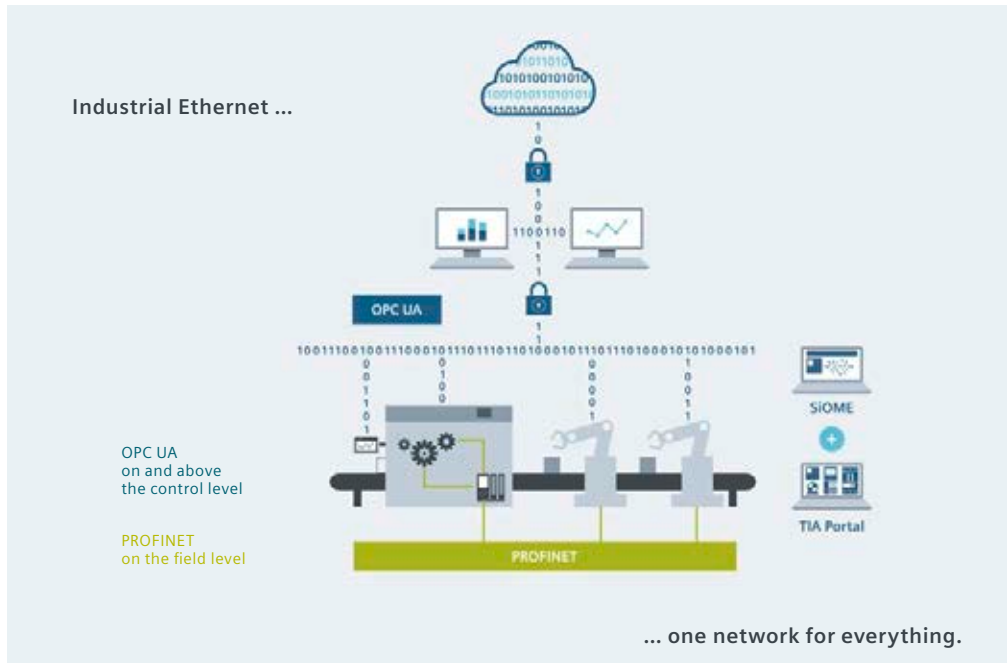
HIGHLIGHTS

- Transparent networking thanks to Ethernet-based networks
- Standardized profiles such as Profisafe, Profidrive, and Profienergy
- Time-Sensitive Networking (TSN) as "turbo power" for OPC UA and Profinet

The advance of digitalization in the field of automation is transforming communications. No longer is field-level data only relevant for the control level; now it also forms the basis for SCADA or MES systems up to the cloud (e.g., MindSphere). Transparent networking across all levels and systems is the prerequisite for this, made possible by Ethernet-based networks. Thanks to standardized protocols and profiles, the industrial communications requirements of tomorrow are already being met today. Profinet – the leading Industrial Ethernet standard for automation – is playing an important role in this. As the most advanced field-level standard, it meets all requirements for openness, performance, flexibility,

and efficiency. Standardized profiles such as Profisafe, Profidrive, and Profienergy simplify communication at the field level.

The OPC UA communications standard provides open, secure communications regardless of the manufacturer on the same network. The standard is the optimal addition to Profinet in the vertical connection to higher-level systems such as MES or cloud applications as well as in communications between machines (M2M). Control-level networking is child's play with the Simatic OPC UA client of the Simatic S7-1500 controller. Internationally defined interfaces under OPC UA – known as companion specifications – can be easily linked with the variables

from the control system and imported via TIA Portal, using the Siemens OPC UA Modeling Editor. The combination of OPC UA and Profinet is already becoming the future-proof foundation for industrial communication, offering users the investment security that they need. With Time-Sensitive Networking (TSN), OPC UA and Profinet will rely on the future Ethernet standard. They will benefit from increased Quality of Service (QoS), higher bandwidths, lower transmission latencies, and convergence in the network, using this as a kind of "turbo power." ∎

↗ **siemens.com/profinet**
↗ **siemens.com/opc-ua**
↗ **siemens.com/tsn**

Automation Systems

Simatic automation systems offer the right industrial controller for every application: for small to large quantity structures and widely varying performance or environmental conditions. The Simatic controllers are also available in a fail-safe version, the S7-1500 Advanced Controller, with advanced Motion Control functionality, a multifunctional platform, and in redundant design.

HIGHLIGHTS

• Engineered like a standard CPU
• Link field devices using a Profinet ring

Redundant CPUs for Simatic S7-1500 controllers

Redundant and highly available

Redundant CPUs complete the range of Simatic S7-1500 controllers. They are engineered like a standard CPU, with program and data synchronization being handled by TIA Portal V15.1 and the redundant CPUs. There is no additional work for the user.

CPU1513R and CPU1515R are suitable for small and medium-sized projects. The strength of these CPUs lies in their redundancy. If one CPU fails, the backup CPU will automatically assume control of the process. This prevents data loss and allows the process to resume quickly. The field devices are linked to the CPUs in order to increase the devices' availability for commu-

nication. This way, none of the devices are disconnected even if the fieldbus is interrupted, provided the devices support Profinet's S2 redundancy (e.g., ET 200SP).

CPU1517H has the same features but is more powerful in order to handle larger-scale applications. This CPU uses a dedicated synchronization module that allows for a faster, more fluid switchover. Support for redundant Profinet networks is planned in the next development steps. ▪

↗ **siemens.com/s7-1500**

- Portfolio extension for the Technology CPUs – CPU 1515SP PC2 T and CPU 1515SP PC2 TF Distributed Controllers – to combine expanded Motion Control functions with Windows applications
- Control of kinematics with up to four interpolating axes, for example cartesian portals, roller pickers, SCARA robots, articulated arms, and delta pickers
- Reliable monitoring of kinematic motion in the space (supported kinematics: cartesian portals, vertical roller pickers, articulated arms, and SCARA robots)

New safety functions and expanded portfolio for Technology CPUs

Scalable Motion Control solution

Digitalization is increasing the level of automation and the use of kinematics for handling tasks in the field of machine and plant construction. Production environments in particular require maximum efficiency, precision, and availability. It is also important to ensure safety, for example, by monitoring kinematic motions in space during the setup and production process. Siemens provides technological solutions for this based on its Advanced and Distributed Controllers.

Simatic Technology CPUs offer predefined kinematics such as cartesian portals, roller pickers, SCARA robots, and delta pickers to make it easy for users to control kinematics with up to four interpolating axes, for example, for pick-and-place tasks. Free transformation interfaces allow seamless integration into the user's kinematics. An intuitive configuration editor with graphical support is available for the parametrization of the kinematics. The programming environment for programming the motions in space is the familiar Simatic Step 7, with standardized, PLCopen-compliant function blocks. TIA Portal features an integrated kinematic trace with trace marking to visualize and diagnose the movements. It also has a kinematics control panel for commissioning.

The Simatic Safe Kinematics software library for the fail-safe S7-1500 Technology CPU (CPU 1517TF-3PN/DP) can be used in conjunction with Sinamics S120 (FW5.1 and higher) to safely monitor the motion of selected kinematics in space. The speeds of selected points in the kinematics (e.g., tool center points) as well as freely configurable zones (e.g., working and protection zones) can be monitored to protect machine tool operators.

In terms of hardware, the Distributed Controller portfolio now also includes the two Open Controllers, CPU 1515SP PC2 T and CPU 1515SP PC2 TF. The basis for this is the new CPU 1515SP PC2 Open Controller hardware. It combines the functions of a PC-based Software Controller with visualization, Windows applications, and central I/Os in a single compact device. The PLC with callable C/C++ functions, a concept known from the ODK CPUs, offers users perfect interoperability with the expanded Motion Control functions of the Technology CPUs as well as with the scalable Sinamics drive portfolio. The combination of PC-based controller and high-level language programs provides openness and flexibility. This makes the Simatic S7-1500 Open Controller highly attractive for special-purpose machine manufacturing (e.g., in regard to cloud applications). ∎

↗ **siemens.com/t-cpu**
↗ **siemens.com/simatic-technology**
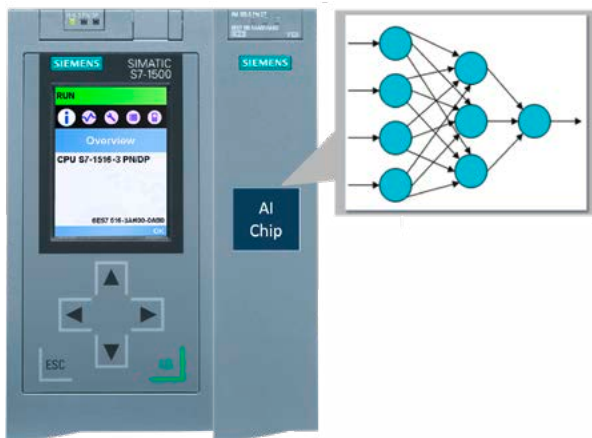
Simatic S7-1500 / ET 200MP TM NPU

Artificial intelligence provides added value

Simatic S7-1500 / ET 200MP TM NPU is equipped with a USB 3.1. and a gigabit Ethernet port and has no other function "out of the box." It only becomes functional when a trained neural network is loaded via an SD card. The TM NPU (Neural Processing Unit) has an integrated AI chip, which allows it to process neural networks efficiently. The interfaces can then be used to process the data from the connected sensors (e.g., images, audio, vibrations) and from the CPU program, on the basis of the loaded neural network. This results in much more efficient, "human-like" behavior. In the past, camera-based recognition of workpieces was only possible if the system was "taught" each workpiece precisely and in advance. Now, users can design this process with much greater flexibility based on e.g. existing image data. The resulting advantage is evident in pick-and-place applications, for example, where a mobile robot has to be able to recognize, remove, and position components that are lying loose in a box. Added value is also realized in quality inspections, where expert human knowledge about a product or process can be transferred to the module by continuously training a neural network with this (image) data by means of a connected camera. ■

↗ **More informations**

NEW FEATURES

- New module for Simatic S7-1500 / ET 200MP with integrated AI chip
- Evaluation of input data (video, audio, CPU data) via neural networks
- More efficient implementation of tasks such as pick-and-place applications or quality checks based on expert (human) knowledge
- Connection of sensors via USB 3.1. and gigabit Ethernet port
- Engineering and handling via TIA portal and AI toolkit

SM 1238 Energy Meter 480 VAC

Expanded measuring range

NEW FEATURES

The functional scope of the Energy Meter module for the Simatic S7-1200 Basic Controller is being expanded. The module will no longer be supplied via phase L1, but rather via the backplane bus. So now it will be possible to carry out measurements below a voltage level of AC 90 V down to 0 V for the measuring point. With this new capability, the Energy Meter module is opening up new areas of application in the field of power generation and in the environment of special power supply systems (e.g., IT networks). ■

- Expanded measuring range: from AC 0 V instead of the previous AC 90 V up to the maximum value
- Support for special power supply systems (IT networks)
- Data buffering directly in the module
- Easy expansion of existing machines and plants

↗ **siemens.com/s7-1200**

Corresponding Sitrain offer: TIA-EMES
siemens.com/sitrain-tia-emes

Sitop LOGO! ICL230 inrush current limiter

Maximum service life for switching modules

For energy-saving lighting, LED lights are particularly well suited for use in buildings. When lighting large rooms or corridors, there also needs to be a central switching system for these light sources. The problem is that LED lights require an extremely high start-up current – and most switching modules are not designed for this. One way to ensure that these modules reach their normal service life is to use the small but powerful LOGO! ICL230 inrush current limiter. It reduces the inrush currents of all types of 230-VAC devices, for example, downstream switched-mode power supplies, to 10 A. So when several 230-V devices are switched on simultaneously, the inrush current limiter prevents unintentional tripping of upstream fuses or breakers. In this case, the sum of the continuous current ratings must not exceed 5 A. ■

↗ **siemens.com/sitop-addons**

NEW FEATURES

- Maximum service life for components that are sensitive to currents (e.g., relays) thanks to limitation of the current during each switching operation
- Upstream circuit breakers do not trip accidentally when the plant is switched on
- The stepped profile of the LOGO! ICL230 housing fits in all subdistribution boards

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Simatic Field PG M6

Rugged platform for TIA Portal engineering

The latest generation of this high-performance programming device, recognizable by its silver-colored enclosure top with M6 printed on it, is optimized for engineering with TIA Portal. The programming device is perfectly suited for mobile use involving configuration, commissioning, service, and maintenance in machine- and plant-level environments. Simatic Field PG M6 is equipped with a fast DDR4 work memory of up to 32 GB and an impact-resistant SSD with up to 2 TB for mass storage. The device's lightweight, rugged, fully shielded cast magnesium enclosure makes it suitable for use in harsh industrial environments. Impact-absorbing elements on exposed parts of the enclosure protect against shaking and vibrations. The Comfort version of the programming device comes with a high-performance Intel Core i5 processor. The Advanced version has the even-more-powerful Intel Core i7 processor and can be optionally configured with the Simatic S5 interfaces. Simatic Field PG M6 is delivered ready for configuration, with the Windows 10 Enterprise operating system and the most recent version of the TIA Portal engineering software for controllers, safety, and HMI preinstalled. Step 7 Professional 2017, WinCC flexible 2008, and Step 5 are also preinstalled for use with older projects. ■

↗ **siemens.com/simatic-pg**

HIGHLIGHTS

- New device generation gets an attractive new look with silver-colored enclosure top
- Optimized for engineering with TIA Portal, including Step 7 Safety Advanced
- Latest wireless and Bluetooth technology (WLAN 802.11ac, BT V5.0)

- Latest Intel Core i5/i7 processor technology (8th gen., H-series, UHD Graphics 630)
- All common Simatic interfaces for industrial automation applications are onboard (RS232, Profibus, Profinet, Simatic Card ...)
- Especially rugged (semi-ruggedized) for use in harsh industrial environments

TIA Selection Tool

Product selection and drive design combined in a single tool

TIA Selection Tool guides users quickly through every automation project, helping them select and configure devices correctly and with the optimal dimensions. The smart CPU selection takes precise account of the individual requirements for Motion Control and fail-safe functionality. Sizer is integrated for drive dimensioning. By displaying device limits, TIA Selection Tool allows users to be assured that their plants are dimensioned correctly with the desired capacity reserves.

Projects created in TIA Selection Tool can be imported into the hardware configuration of TIA Portal. Interfaces to electrical planning tools such as Eplan help ensure integrated engineering without multiple entries. ■

↗ **siemens.com/tst**

NEW FEATURES

- Smart assistant for CPU selection also meets fail-safe and Motion Control requirements precisely
- Sizer is integrated for drive dimensioning
- Interface to TIA Portal and Eplan: import projects and manage symbolic addresses and signal names

Distributed I/O Systems

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

Simatic ET 200SP F-AI

Fail-safe current metering

HIGHLIGHTS

- Four fail-safe analog inputs
- Measuring range of 0/4 mA to 20 mA
- 16-bit resolution (incl. sign)
- Option to select 2v2 evaluation on board
- Channel-selective diagnostics and passivation
- Compatible with up to PL e/Cat. 4/SIL 3

The new Simatic ET 200SP F-AI fail-safe analog module is as compact as a standard module and expands the range of fail-safe modules for Simatic ET 200SP. It has four fail-safe analog inputs that can capture signals from 0 or 4 to 20 mA. Operators can use the inputs either as single-channel inputs (up to PL d/Cat. 3/SIL 2) or in pairs using the integrated 2v2 evaluation (up to PL e/Cat. 4/SIL 3). The integrated, short-circuit-proof power supply or an external encoder supply powers the two- or four-wire measuring transducers. Integrated LEDs help localize errors faster. It is also possible to have channel-selective, detailed diagnostic information displayed in plain text without additional configuration, for example on a Simatic HMI Panel. If possible, only the affected channel is passivated if there is an error. ■

↗ **siemens.com/et200sp**

Simatic ET 200eco PN

Quick error localization

The fail-safe F-DI 8/F-DQ 3 module is the latest addition to the Simatic ET 200eco distributed I/O system product range with IP65/67 degree of protection. The compact fully sealed zinc die-cast housing encloses eight fail-safe digital inputs and three fail-safe digital outputs. The M12 connection system makes it possible to connect either two individual sensors or a two-channel sensor, such as a position switch or light curtain, on the input side using a Y adapter. The two-channel outputs are PNP/NPN switching. Errors can be localized quickly thanks to the channel-selective diagnostics of both the inputs and the outputs. As with all modules from the Simatic ET 200eco PN series, this module also has an integrated Profinet connection with a 2-port switch. The Profisafe address is saved on a plug-in F-coding element which, in the event of a module change, only has to be plugged into the new module – with no need to reset DIL switches. ■

↗ **siemens.com/et200eco**

HIGHLIGHTS

- Eight fail-safe DC 24 V digital inputs (M12)
- Three fail-safe DC 24 V/2 A digital outputs, PNP/NPN switching (M12)
- Integrated encoder supply
- Channel-selective diagnostics and passivation
- Quick module exchange thanks to F-coding element instead of DIL switches
- Compatible with up to PL e/Cat. 4/SIL 3

Simatic ET 200SP Energy Meter 480VAC HF

Energy meter with grid analysis

High Feature Energy Meter modules for Simatic ET 200SP allow for even more efficient and precise measurement of energy and power consumption. Versions are additionally available for Rogowski coils and for 333-mV current/voltage transformers.

The modules have a number of integrated grid analysis functions that allow them to analyze, for example, voltage drops, over-current and overvoltage, amplitude symmetry, and distortion factor. The values are then stored with a time stamp for subsequent diagnostics. The grid analysis also includes analysis of the 1st to 40th harmonics. This enables an even more precise evaluation of the energy consumptions, since the power factor of the fundamental (cos φ) can be determined directly.

The meter can switch from energy meter mode to grid analysis mode during ongoing operation. Energy measurements are never lost in either mode. ∎

↗ **siemens.com/et200sp**

Company-wide energy management with Simatic Energy Manager:
siemens.com/simatic-energy-manager-pro

NEW FEATURES

- Versions for current transformers and Rogowski coils
- Suitable for use in all grid types (TT, TN, IT) up to AC 480 V
- Numerous functions for grid analysis
- Dynamic switching between operating modes during runtime without data loss

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Simatic ET 200SP IM 155-6PN/3 HF

More flexibility and performance in the field

NEW FEATURES

- Module-to-module communication for the shortest reaction times
- More efficient data exchange between controllers in the same network
- Optional cable strain relief and up to 10 ms power failure buffering

The scalable Simatic ET 200SP distributed I/O system connects to Profinet via the interface module. It exchanges data between the higher-level control system and the I/O modules. Users can freely select the connection technology, as they can now plug two variable bus adapters into the new three-port interface module (IM). This makes it possible to lay an additional spur line or to connect a programming device or HMI panel locally in the field. The new three-port IM helps ensure efficient data exchange between several controllers in the same network, and the high feature version also offers hardware upgrades. The new module-to-module communication function allows data to be transmitted within the Simatic ET 200SP station from an input module (regardless of whether it is a digital, analog, or technology module) directly to an output module, without having to pass through the CPU. This can significantly reduce reaction times. ∎

↗ **siemens.com/et200sp**

Siplus HCS

More reliable, more precise control of heating processes

Thermal processes play a key role in the manufacturing industry. Maintaining them at a precise level can have a decisive influence on product quality. Siplus HCS heating control systems, the I/O systems for industrial heating applications, ensure that electrical heating elements are always at the right temperature. The intelligent heating control systems reduce the total cost of commissioning, operation, and maintenance by up to 70% compared to solutions with individual components. Integrated diagnostics and high reproducibility allow for improved heating processes together with increased product quality.

The Siplus HCS4200 flexible industrial heating control system controls heating elements up to 20 A at voltages of 45 V, 70 V, and 110 V in 230/277 or 400/480-V networks. They also have new functions that make them more versatile, more reliable, and easier to use. ■

↗ **siemens.com/siplus-hcs**

NEW FEATURES

- Measurement of fault current for improved plant safety, for example, when heating in liquids
- Power regulation for constant temperature input even with changing line voltage or aging heating elements
- Adaptive soft start: automatic calculation of the optimal soft-start duration
- Two-pole switching of outputs allows the heating circuit to be turned off even if the Triac has failed, thus ensuring greater plant safety

Products for Specific Requirements

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

Siplus CMS

Mechanical data becomes digital added value

The condition monitoring and analysis of mechanical components can be easily integrated into Simatic S7-1200 with the Siplus CMS1200 Condition Monitoring System. This allows users to detect damage early and plan maintenance tasks promptly. Siplus CMS1200 records vibration signals via IEPE vibration sensors, analyzes and diagnoses them, and visualizes them in a web browser. The system then transmits the results of the analysis to the Simatic CPU and can provide decision-making aids for maintenance staff. For example, the chronological progression of measured values can be used to estimate how much longer the system can reliably operate. The interaction between Siplus CMS and MindSphere opens up entirely new prospects. Originally designed to analyze large quantities of data, MindSphere allows users to monitor machinery fleets distributed around the world and thereby reduce downtimes. This turns mechanical condition data into digital added value. ■

↗ **siemens.com/siplus-cms**

NEW FEATURES

- Direct transfer of data to MindSphere via MindConnect Lib
- Determination of speed without additional motion sensor

Siplus extreme

Ideal for harsh environments

NEW FEATURES

- −40°C start-up of the Simatic ET 200SP module
- Horizontal installation of the Comfort Panels

The Siplus extreme version of Simatic ET 200SP is now also certified for starting at −40°C. The expanded temperature range ensures that the module will start even after lengthy downtimes at low temperatures without heating, which saves energy, space, and time.

The Siplus Comfort Outdoor Panel was designed for operation at up to 100% humidity under exceptional medial loads as well as increased mechanical stress. The panel now also offers an expanded temperature range of −30°C to +60°C for use in areas such as refrigerated warehouses and desert regions. The front of the device provides IP66 degree of protection against dust and water, the same level required in mining and shipping applications. Thanks to its high vibration and shock resistance, the new Siplus Comfort Outdoor Panel is the optimal solution for use in vehicles or in the stamping machine and press sector. The UV resistance ensures long-lasting visual appearance and function. Now that Siplus Comfort Outdoor Panels can also be installed horizontally, the possible applications have increased dramatically. ■

↗ **siemens.com/siplus-extreme**

Simatic ET 200SP TM ECC PL ST

Reliable charging for electric vehicles

NEW FEATURES

- AC / DC charging with Simatic ET 200SP
- Basic communication in accordance with IEC 61851
- DC charging process in accordance with DIN SPEC 70121
- Reliable shutoff of charging power
- Modular design in the Simatic ET 200SP system
- Configuration via TIA Portal V15

A key component when charging electric vehicles is the communication between the electric vehicle and the CPU installed in the charging infrastructure. The new Simatic ET 200SP TM ECC PL ST Technology Module enables powerline Green PHY communication as defined in DIN SPEC 70121 in combination with a pulse-width-modulated signal in accordance with IEC 61851. Based on this communication, the Simatic ET 200SP TM ECC PL ST Technology Module can be used for conductive DC charging of electric vehicles in charging mode 4. Apart from the communication, the technology module also offers two digital outputs for standards-compliant shutoff of the DC disconnector within 30 ms. It can be used within a Simatic ET 200SP station or centrally at DC charging stations as well as at distributed charging points in conjunction with an IM 155-6. The user is free to choose the position of the plug-in connector. Depending on system requirements,

the Simatic ET 200SP CPU 1515 PC Open Controller can serve as a basis for billing software or back-end connections, and further Simatic ET 200SP modules, such as Simatic ET 200SP AI 4xRTD/TC, can be used to monitor the temperature of the charging cable. This creates a flexible, modular overall concept. ■

↗ **siemens.com/et200sp**

PC-based Automation

From compact, fanless embedded IPCs to powerful expandable high-end IPCs, the products in the Simatic IPC portfolio are the ideal foundation for many PC applications in the manufacturing environment.

NEW FEATURES

- Fast commissioning, because Edge software is already preinstalled on the IPC hardware
- Powerful platform for running Edge apps
- Integrated connectivity for automation and the cloud system

Simatic Edge Device IPC227E

Powerful basis for Edge apps

Siemens Industrial Edge brings computing power directly to the production floor, because Edge devices collect and process data where they are generated. With industrial Edge, applications from the central Edge management can be downloaded to – and updated on – Edge devices connected to machines. Changes to the general configuration of the application will result in software updates so the machine always has the latest version, and the plant maintains maximum productivity.

The hardware – Simatic IPC227E – is an extremely compact and flexible embedded industrial PC. With its closed, all-metal enclosure, Simatic IPC227E offers maximum industrial functionality for flexible use even under harsh conditions – while remaining maintenance-free. These features make it the ideal hardware platform for Edge applications. ∎

↗ **siemens.com/industrial-edge**

Simatic IPC6x7 / IPC8x7

Maximum performance and flexibility in industrial environments

When it comes to quickly processing and saving very large volumes of data, completing demanding visualization tasks, or individually expanding industrial PCs with a number of cards or modules, high-end IPCs – Simatic IPC627E, IPC647E, IPC677E, IPC847E – provide an ideal balance between innovative high-performance technology and excellent investment protection. The devices in the new generation have an improved enclosure design and are available as a rack, box, or panel PC. They are intended for use in the control room or as high-performance, machine-level systems in data-intensive processes.

Powerful 8th generation Intel processors and fast onboard HD graphics can handle even the most challenging tasks. Whether the user wants rack PCs for the control room or box PCs for use in control cabinets or on machines, high-end IPCs provide a rugged, future-proof platform for industrial environments. The devices feature a high degree of installation, interface, and software compatibility. ∎

↗ **siemens.com/ipc**

- Ultra-compact enclosure (0.3 l) with various mounting options (standard rail, wall, portrait mounting)
- Optimal performance/volume ratio: quad-core Atom processor, 4 GB RAM, 128 GB SSD
- Up to three LAN and four USB ports
- Preconfigured versions available from stock

Simatic IPC127E

Ultra-compact IoT gateway

Networking existing plants is often a big challenge. Machines made by different manufacturers and representing different generations of technology speak different languages when it comes to data processing. The solution: Simatic IoT gateways such as Simatic IPC127E – the open platform for collecting, processing, and transmitting data directly in the production environment. Unlike Simatic IOT2000, Simatic IPC127E can be either Windows- or Linux-based, making it a fitting addition to the Simatic IoT gateway portfolio. It is ideally suited for use between the cloud or the company's internal IT level and production. Its ultra-compact design allows it to be easily integrated in the automation solution, requiring minimal space in the control cabinet or directly on the machine. Users can get the product they need in next to no time, thanks to preconfigured versions. ■

↗ **siemens.com/ipc127e**

- State-of-the-art technology for maximum performance (eighth gen. Intel processors, 64 GB RAM, NVMe SSD, USB 3.1 gen. 2, USB Type-C)
- Maximum expandability (3 graphics interfaces, 3 LAN, 6 USB, and up to 11 PCI(e) ports) for flexible integration in new and existing plants
- Panel PC with 19", 22", or 24" multitouch glass front
- Maximum data and system availability in 19" rack, in the control cabinet, or directly on the machine

Simatic ITP1000

Maximum mobile performance for everyday applications

Rugged, handy, and a true powerhouse – the Simatic Tablet PC with the performance of a Simatic Industrial PC is perfectly suited for all everyday industrial mobile applications. This is thanks to the high-performance Intel Core i5 Skylake CPU, the EMC-tested mechanical and electrical ruggedness, and a number of interfaces that make it equally suitable for work in both industrial and office environments.

The future version of the Tablet PC comes with a new display: instead of the 10.1" display in WXGA format, Simatic ITP1000 will be available in WUXGA format. This provides higher resolution and brilliant colors. The sharp contrast and high brightness makes all visualizations perfectly recognizable, even in industrial plants with poor lighting conditions. The new version also has a more usable barcode reader, which can be configured using Zebra software. ■

↗ **siemens.com/itp1000**

NEW FEATURES

- 10.1" WUXGA format (resolution: 1920 x 1200, displayable colors: 16.7 million, vertical frequency: 60 Hz, contrast > 600 : 1, brightness: > 350 cd/m^2)
- Barcode reader can be configured using Zebra software

Simatic HMI IFP2200 INOX (Ethernet) / Comfort Panel INOX

INOX devices for hygienic production

Simatic HMI INOX devices are designed for use in the food and beverage, pharmaceutical, and fine chemistry industries as well as in other hygienic applications for machine-level operation and monitoring. For this reason, the devices with stainless steel fronts were developed in accordance with DIN EN 1672-2 "Food processing machinery – Safety and hygiene requirements." New to the product family is a Simatic Industrial Flat Panel (Ethernet monitor) with a projected capacitive 22" touchscreen for multifinger operation. With its low mounting depth and rugged front, Simatic IFP2200 is ideally suited for industrial and machine-level use. The IFP with stainless steel front is now also better able to meet the high requirements of food production environments. IP69 degree of protection even protects against high-pressure cleaning.

The portfolio of INOX devices has additionally been expanded to include built-in units with stainless steel frames and glass fronts. Simatic HMI TP900 and TP1200 Comfort INOX PCT are also certified stainless steel devices for all applications with special hygiene requirements. ■

↗ **siemens.com/inox-hmi-devices**

NEW FEATURES

- Rugged glass front
- Projected capacitive touchscreen
- IP69K degree of protection on the front side
- ATEX 2/22

Human Machine Interface

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

Expanded options for Simatic WinCC V7.5

Plant transparency across all levels

NEW FEATURES

- Structured data types from the PLC to the image objects
- OPC UA client interface for alarm & condition
- Integrated standard gateway functionality for smart data in cloud solutions
- Dynamic SVG graphics

Greater openness by expanding the range of interfaces was the key focus when developing the new version 7.5 of the WinCC V7 SCADA system. The developers implemented a cloud connection to handle the continually increasing quantities of data generated by transparent networking. From the manufacturing level to company-wide resource planning, the volumes of data are growing as digitalization advances. These data have to be quickly and accurately evaluated and then further processed as smart data in the cloud.

The SVG graphics represent another step toward even more efficient engineering and modern design. They have dynamic characteristics, which make it easy to configure a homogeneous, up-to-date graphical user interface. ■

↗ **siemens.com/wincc-v7**

Corresponding Sitrain offer:
ST-BWINOND
siemens.com/sitrain-st-bwinond

Simatic WinCC Open Architecture V3.16

More flexible designs, increased IT security

NEW FEATURES

- Modernization of design elements
- Gesture-based navigation through the operating hierarchy
- Ability to import TIA Portal V15 projects

Simatic WinCC Open Architecture V3.16 places the focus on IT security, without neglecting innovations in design. The modernized trend feature allows users to create innovative and customized views for displaying curves. Using layout management and the integrated bird's-eye view simplifies selection of the required information. Customizing legends, trend axes, and comments on data points provide users with many different options for seeing relevant data at a glance. Alarms can be stored directly in the trend display, allowing for quicker analysis of causes and thus better avoidance of outages and malfunctions of the monitored plant.

With regard to security, the connection to third-party authentication systems has been expanded. These systems – as well as customers' proprietary systems – can now be integrated in WinCC Open Architecture. Another important feature is the expansion of the TIA Importer: it now supports projects with TIA Portal V15. This makes it easier to integrate TIA Portal projects and significantly reduces configuration effort. ■

↗ **siemens.com/wincc-open-architecture**

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.

10-A and higher power supply units:

- 12-V devices with 2 A, 7 A, and 12 A rated output current
- 24-V devices with 1.3 A, 2.5 A, 3.7 A, 5 A, 10 A, 20 A rated output current
- Rugged AC wide-range input
- Up to 95% efficiency
- 150% extra power for start-up processes
- 120% continuous output up to 45°C
- Diagnostics monitor: DC OK, utilization, service life
- Diagnostics interface: output voltage and current, temperature status, utilization, service life, over/undervoltage at the output, type
- Active PFC (Power Factor Correction) for low reactive currents

Sitop PSU6200

All-around power supply for a wide range of applications

Sitop PSU6200 is the new especially powerful and rugged power supply unit for standard applications. It is also especially future-oriented, as it already meets the EMC standard that will apply to the DC output in 2020. The single-phase 12-V and 24-V power supply units offer extensive functions and features for focused diagnostics, fast installation, and reliable operation. They have a wide-range input for alternating voltage, which also allows connection to direct current and is particularly resistant to under- and overvoltage. Heat generation is kept to a minimum thanks to high efficiency and efficient heat dissipation via the metal housing. This saves space by allowing the compact power supply units to be installed next to other devices without lateral clear-

ance. The push-in connector also ensures easy installation with fast and reliable wiring. The unambiguous identification of terminals avoids wiring errors.

10-A and higher power supply units provide information on the status and operating data in relevant messages. The diagnostics monitor uses an LED to indicate whether the output voltage is within range, and how high the utilization is. The diagnostics interface reports voltage and current values and the temperature status, and counts under- and overvoltages at the output. The only item needed for diagnostics is the digital input of a PLC. Free-of-charge function blocks for Simatic S7-1200 and S7-1500 evaluate the serial code, and faceplates

facilitate visualization in WinCC. The comprehensive condition monitoring enables timely reaction to critical conditions and makes the supply of the control circuit even more reliable.

The extra power feature also helps ensure reliable operation by permitting 50% overload for five seconds, for example for start-up processes. The constant current behavior limits the current in the event of higher overloads and maintains the output voltage for as long as possible. This can even clear brief short circuits. At ambient temperatures of up to 45°C, the powerful supply units continuously deliver 20% above their rated current. ∎

↗ **siemens.com/sitop-psu6200**

Sinamics G120X drive for infrastructure applications

Mastering the elements

Sinamics G120X is the new series for use in infrastructure applications. Its specialty: controlling motors that drive water and air, while impressing users with maximum simplicity, reliability, and efficiency.

Every industry and every application has special requirements. Sinamics G120X is optimized for pump-and-fan applications in infrastructure. The new series can meet any challenge with its available power output range of 0.75 kW to 630 kW – from irrigation, desalination, and drinking water or wastewater treatment to fresh air supply/exhaust in road tunnels and subway systems. Sinamics G120X can operate with any motor, but it is most effective with Siemens synchronous-reluctance motors.

Sinamics G120X offers precisely those characteristics that are needed in infrastructures: all devices in the series are consistently designed for cost-optimized, resource-saving operation at all voltages and in all power supply systems. Its compact design saves space in the control cabinet, and it offers motor cable lengths of up to 150 m without an additional output reactor. The integrated safe torque off (STO) safety function is SIL3 certified.

Ready for the future

Sinamics G120X is ready for digitalization thanks to a cloud connection. This allows users to visualize and analyze the statuses of the converter and machines. Sinamics Connect 300 is available for easy connection to the cloud. The Analyze MyDrives MindSphere application makes maintenance easier by providing users with valuable data to optimize their processes and their maintenance strategy.

Easy to use

The new converter is remarkably simple. Even inexperienced users will have no problem operating and handling it. The Smart Access Module and the IOP-2 operating panel make short work of commissioning. Selecting and ordering Sinamics G120X is fast, too. All a user needs for this is an order number in the Siemens Drive Technology Configurator.

Reliable and rugged

With its rugged design, Sinamics G120X is predestined for use in infrastructure applications. The drip-proof housing, painted modules, high EMC category C2 (optional C1), and protection class IP20 (optional IP21 in UL open type) ensure reliable operation in all industrial environments. Thanks to an integrated DC link reactor, it also operates under all grid conditions.

Impressively efficient

Not only does Sinamics G120X meet all relevant EU energy-saving standards, it is also exceptionally efficient, with an efficiency level of over 98%. An extensive range of integrated, application-specific energy-efficiency functions, such as flux reduction, keep running mode, pump boost, or eco mode, complete this new converter of the future. ∎

↗ **siemens.com/sinamics-g120x**

shutterstock

Drive Systems

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

NEW FEATURES:

- Expanded power output and supply voltage variants of 0.4 kW to 7 kW (with 3AC 400 V)
- Extended safety functions, common DC link coupling, and optional infeed rail system
- Configuration and commissioning via Sizer and Startdrive; engineering in TIA Portal V15.1
- Connection to Simatic ET 200SP Open Controllers and Simatic S7-1500 Software Controllers

Sinamics S210

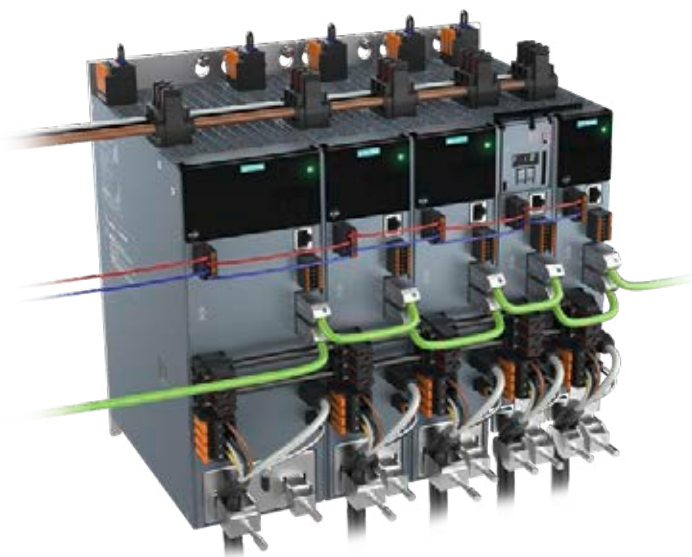# Higher power output, enhanced safety, easier engineering

From now on, additional power output and supply voltage variants are available for the Sinamics S210 high-performance single-axis servo drive system for midrange applications. The existing power output range of 50 W to 750 W (with 1AC 230 V) will be gradually expanded with device variants from 0.4 kW to 7 kW (with 3AC 400 V) and the associated Simotics S-1FK2 servomotors with shaft heights up to 100 mm. The first new frame size with a power output of 0.4 kW to 1 kW (with 3AC 400 V) rings in the comprehensive expansion of the converter system. Sinamics S210 has a wide-range power supply connection of 3AC 200 V to 480 V for worldwide use. The new device variants have been functionally expanded with an optional infeed rail system and a common DC link coupling. The converter's DC link coupling enables power compensation during dynamic reversing operations. This reduces the

waste heat generated during braking via the integrated braking resistor and increases the travel cycle of the individual axes.

Sinamics S210 can use Simatic S7-1500 Advanced Controllers for higher-level control, but now can also use Simatic ET 200SP CPUs and Open Controllers or Simatic S7-1500 Software Controllers, all connected via isochronous Profinet IRT. The converter also boasts integrated safety features: in addition to the standard functions, users can now obtain an optional license to activate extended safety functions such as SLS, SSM, and SDI. With the introduction of the extended safety functions, the encoders installed in the Simotics S-1FK2 motor were also increased to a 22-bit resolution. Simotics S-1FK2 servo motors, whether compact or highly dynamic depending on the user's requirements, achieve maximum dynamic response and precision in conjunction with the rapid sampling and smart control algorithms of Sinamics S210 and a high-quality feedback system. All this is combined with low rotor inertia and high overload capacity. They are therefore primarily suitable for use in packaging machines, handling, wood and ceramic processing, and digital printing.

The configuration and commissioning of the Sinamics S210 drive system have also been expanded: the TIA Selection Tool provides user-friendly support for the technical design of the components required for a drive task. Apart from simple direct commissioning via the converter's web server, Sinamics Startdrive also enables engineering via TIA Portal (version V15.1 and higher). The tool for configuration, commissioning, and diagnostics has been optimized for consistent use of the benefits of TIA Portal – a common working environment for PLC, HMI, and drives. ∎

↗ **siemens.com/sinamics-s210**

NEW FEATURES:

- Higher safety level with the new functional safety function
- Only one main contactor or circuit breaker required to achieve safety levels SIL 3 and PL e
- Reduced number of components saves money, space, and maintenance costs

Sinamics DCM

Saving space and lifecycle costs while increasing safety

DC drives have been tried and tested in daily use for decades, thanks to their dynamic response, ruggedness, and economic efficiency. The Sinamics DCM plug-in converter now comes with the functional safety function. This makes it possible to achieve safety levels SIL 3 and PL e across the entire power output range using just one main contactor or circuit breaker, ensuring optimal protection of people, machinery, and the environment. DC drive systems used to require two main contactors or circuit breakers. The new function results in a higher safety level. Eliminating one of the two contact blocks not only saves on procurement costs; it also significantly reduces the amount of space required for the entire drive configuration. With fewer components, the DC drive system is more rugged and reliable, and requires less servicing. These simplifications and optimizations allow Sinamics DCM to make better use of its advantages in DC drive technology: fine scalability for customized solutions in both basic and demanding applications, flexible expandability, high user-friendliness, high dynamic response with torque rise times well below 10 ms. Alongside these features, Sinamics DCM is equipped with integrated intelligence, which combines open-loop and closed-loop control and a power unit in a single compact device. ■

↗ **siemens.com/sinamics-dcm**

Sinamics Smart Access Module

Do it wireless, do it faster

Mobile devices (smartphones, tablets, laptops) can connect wirelessly to the Sinamics G120 and V20 converter series via the Sinamics Smart Access Module. This gives users a powerful tool – with numerous functions for wireless commissioning, diagnostics, and service – as an additional option for use with the Sinamics G120 and Sinamics V20 frequency converters. Setting up the module only takes a few steps thanks to the web server function, with no need for downloads, installation, or additional software. All the user needs is a standard web browser and an up-to-date operating system. The intuitive user interface of the Sinamics Smart Access Module is easy to use and configure. ■

↗ **siemens.com/sinamics-accessories**

NEW FEATURES:

- Wireless access to the converter via mobile devices
- One tool for mobile commissioning, diagnostics, and service
- Intuitive user interface, menu navigation, and help function

Sinamics S120 Chassis-2 & Cabinet Modules-2

Highly flexible, exceptionally reliable

Sinamics S120 Chassis-2 and Cabinet Modules-2 excel at meeting the changing requirements placed on frequency converters. This innovative generation of high-performance frequency converters boasts more flexibility, maximum reliability, simplified engineering, and increased economic efficiency. They are primarily used in industries such as metal or paper processing. The electrically/mechanically innovated Sinamics S120 Chassis-2 and Cabinet Modules-2 offer even more possible applications and increase reliability. An improved cooling concept, variable speed fans, and increased alternating load capability help ensure a longer service life. The standardized design and the improved electrical behavior makes engineering tasks easier and increases the system efficiency. The OEM kit allows for easy installation in the control cabinet. The converters are equipped with condition monitoring, making them ready for digitalization and therefore future-proof. ■

↗ **siemens.com/sinamics-s120-innovation**

Corresponding Sitrain offer: DR-S12-CHA-EN
siemens.com/sitrain-dr-s12-cha

NEW FEATURES:

- Expanded power output ranges: MoMo 315 kW
- Improved cooling concept, clocking with double pulse frequency, optimized design
- Ready for digitalization with condition monitoring

Sinumerik Safety Integrated plus

Safety without encoders

There is a new version of Safety Integrated for Sinumerik 840D sl. The Safety Integrated plus safety software saves effort and money – for both configuration and commissioning. The highlight of Safety Integrated plus is the integrated F-PLC of CNC Sinumerik 840D sl.

For example, Safety Integrated plus makes it easy for users to meet the requirement in DIN EN ISO 19085-3 for safe monitoring of encoderless spindles. This is possible thanks to the safely limited speed sensorless (SLS sensorless) function. SLS sensorless ensures safe monitoring of the load-side speed in asynchronous motors. Sensorless means that any existing encoder used for drive regulation need not meet the requirements of a safe encoder. Now users can work safely even without encoders, as long as they have Safety Integrated plus. ■
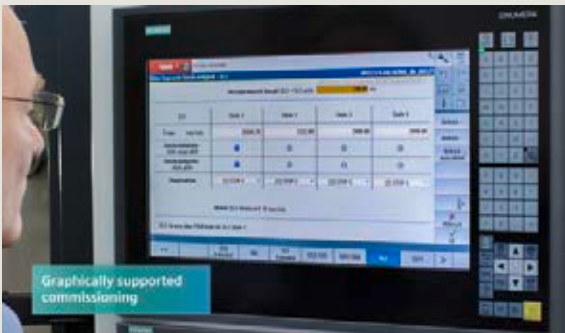
↗ **siemens.com/sinumerik-safety**

Corresponding Sitrain offer: NC-PLUSSIW
siemens.com/sitrain-ncplussiw

NEW FEATURES:

- Encoderless safety for Sinumerik
- Integrated F-PLC for fail-safe program
- Infinitely variable modification of the SLS limit

Graphically supported commissioning

NEW FEATURES:

- Sinamics Connect 300
- Analyze MyDrives MindSphere application
- Manage MyDrives Edge application

Sinamics Connect 300 / Analyze MyDrives MindSphere application / Manage MyDrives Edge application

Digitalization in drive technology

Machine builders and users stand to benefit in equal measure from the digitalization of their drive technology. The basis for this is a digital twin throughout the lifecycle – from product to production to performance. Closely linked engineering tools create a comprehensive and consistent machine database, which in turn provides the user with transparency across the entire drive train. Starting from this basis, it is possible to identify and implement optimization measures and, ultimately, develop new business and service models.

Sinamics Connect 300 allows Sinamics converters to be directly and easily connected to the cloud using plug-and-play. Commissioning is also fast, error-free, and cost-effective, since there is no need to make any changes to the hardware or firmware of the drives or to modify PLC programs. Up to eight drives can be connected simultaneously, allowing users to take advantage of scaling effects. Sinamics Connect 300 is particularly suitable for machine tool operators who want to integrate Sinamics drives in their existing, heterogeneous machine park.

The Analyze MyDrives MindSphere application – a component of Sidrive IQ – makes it possible to monitor basic operating states of Sinamics low-voltage converters. Users can then promptly recognize the need for optimization and initiate needs-based service measures.

Manage MyDrives, an Edge application due to be launched in 2019, is available to users locally and in the cloud. It enables simultaneous connection to field devices and the cloud. In the future, Sinamics drives will be integrated in the Industrial Edge System via Edge-capable devices. Manage MyDrives will eventually offer local data preprocessing in order to capture, analyze, and evaluate high-frequency data. Advanced monitoring functionality provides access to relevant low-frequency data in the cloud to enable predictive maintenance. ■

↗ **siemens.com/sinamics-digitalization**

Sidrive IQ

Digital platform for drive systems enhances productivity

The Sidrive IQ cloud-based application provides a digital platform for the evaluation and use of drive data. It enables automated operation monitoring based on system parameters, creating considerably improved transparency. This gives plant and machine operators valuable insights into their drive systems and allows them to record relevant operating information, which they can then use to determine the current status. This, in turn, helps them to monitor and assess changes in operating behavior and to identify measures to minimize unplanned downtime. Maintenance planning and implementation can also be optimized.

The Sidrive IQ functions are now also available for medium- and high-voltage drive systems. Connectivity solutions, such as Simotics Connect 600 for high-voltage motors and Sinamics Connect 500 for medium-voltage converters, make it easy to connect to Sidrive IQ.

The interaction between operating data and digital twins using Sidrive IQ can make measured values, status and operational KPIs, service messages, and technical product data as well as spare part information available. This not only saves time and effort spent on data acquisition, but also simplifies visual analysis and enables faster qualified intervention during both production and maintenance – for a single drive system or for an entire fleet. A comparison of operating, status, and maintenance information across several locations forms a solid foundation for the optimization of customer processes. This makes Sidrive IQ the ideal platform on which to achieve improved drive technology efficiency and productivity throughout the lifecycle. Sidrive IQ can be used to support a wide range of applications in many industries.

Completing the Sidrive IQ digitalization portfolio are customized services such as Digital Check, Connect Package, and – now also for medium- and high-voltage applications – Expert Assistance and Expert Diagnostics (see page 29). ∎

↗ **siemens.com/sidrive-iq**

NEW FEATURES

- Networked drive systems create transparency and allow users to optimize maintenance activities
- Easy to connect to high-voltage motors via Simotics Connect 600 and medium-voltage converters via Sinamics Connect 500
- Customized Sidrive IQ services

NEW FEATURES

- Expert Assistance:
  reduced downtimes with
  cloud-based alarms and
  fast troubleshooting
- Expert Diagnostics:
  minimized downtimes with
  cloud- and expert-based
  condition monitoring

Sidrive IQ Services

Digital expert support

Sidrive IQ Services is the innovative approach for the new generation of Remote Services and Condition Monitoring Services – from corrective actions and troubleshooting to preventive maintenance services and proactive solutions for optimized performance. Sidrive IQ Services provide users with digital expert support to optimize the availability and productivity of their plant. The service experts continuously monitor the connected components, inform the user of any anomalies, and provide support in the planning and implementation of troubleshooting. This way, maintenance and service activities can be optimally planned.

In addition to customized services such as Digital Check and Connect Package, Sidrive IQ Services now also come with Expert Assistance and Expert Diagnostics for medium- and high-voltage applications.

Expert Assistance automatically triggers an alarm in the event of a fault in the drive train. A service expert, who has a full view of all operating parameters thanks to Sidrive IQ, contacts the customer to provide direct support in getting the drive train back in operation. This avoids wasting valuable time transferring data.

With Expert Diagnostics, the service experts continuously monitor the status of the connected devices. Once a weak point is identified, they inform the customer and provide an appropriate service recommendation. An expert report for an in-depth status assessment can optionally be requested. ∎

↗ **siemens.com/ddts**

Simotics HV C air-cooled

Revolutionary cooling concept

An air-cooled version completes the new Simotics HV C platform for compact high-voltage/non-standard motors up to 3.2 MW. Simotics HV C air-cooled has Ex ec and Ex tc types of protection and follows the design principles of the previously launched flameproof version. These air-cooled designs benefit from the revolutionary cooling concept of this platform, which cleverly combines fin cooling and tube cooling. The improved temperature distribution in conjunction with the vibration-optimized, rugged housing design ensures a long service life and reliability even under extreme conditions, quiet operation, and a one-of-a-kind power density. Moreover, all compact, air-cooled high-voltage motors – with and without Ex protection – can now use a common platform with standardized design and handling principles. This reduces effort throughout the entire lifecycle: from planning, procurement, engineering, and plant integration to service, inventories, and spare parts management.

Simotics HV C air-cooled can be optionally integrated – via the Simotics Connect 600 connector box – in the Sidrive IQ digital platform, which enables cloud-based analysis of the status data and hence optimization of the drive system. ■

↗ **siemens.com/simotics-hv-c-air-cooled**

- Unique power density with an increased power output of up to 15% with the same frame size
- Highest flexibility in terms of customer interfaces
- Easier plant integration through reduced weight and space requirements
- Digitalization-ready with Simotics Connect 600 for integration in Sidrive IQ

Simotics XP

Expanded range of applications, complete portfolio

- Expanded shaft height and power output range (up to 1,000 kW)
- Complete portfolio: with reduced start-up currents, efficiency class IE4, rugged design

The new generation of Simotics XP explosion-proof low-voltage motors can be used in even more applications thanks to the expanded shaft height and power output ranges to cover hazardous zones 2 and 22 in the Ex ec and Ex tc types of protection. Shaft heights from 63 mm to 450 mm and power outputs from 0.09 kW to 1,000 kW are now available throughout the portfolio, making it possible to meet high performance requirements in potentially explosive environments. The portfolio of extremely compact, rugged, and flexible Simotics XP motors has also been expanded: Ex ec motors are available in VIK design and with the reduced start-up currents that are frequently required in the process industry. There are now also motors with power outputs of 160 kW and higher in the highest efficiency class IE4. For chemically aggressive or salt-laden environments, users can order Simotics XP up to 1,000 kW with C2 to C5 paint finish as well as stainless steel components and internal coating. ■

↗ **siemens.com/simotics-xp**

Sinamics V20 – New FSAC frame size

Much smaller and even more flexible

The Sinamics V20 is the converter for basic applications – simple to set up, compact and cost effective. The Sinamics V20 converter portfolio is extended by the new frame size FSAC in the voltage range 1AC 200 V to 240 V, 1.1 kW to 1.5 kW. The new frame size FSAC replaces the existing frame size FSB. Compared to frame size FSB, the frame size FSAC is 40% smaller, with dimensions of 90.8 x 160.9 x 147 mm. It also features an integrated radio interference filter according to EN 61800-3 Category C1. ∎

↗ **siemens.com/sinamics-v20**

NEW FEATURES

- Sinamics V20, new FSAC frame size is 40% smaller than the previous frame size FSB
- Even more flexible, space-saving applications for Sinamics V20
- Integrated radio interference suppression filter EN 61800-3 Category C1 for use in the first environment (public grids)

Sinamics V90 frame size FSA

With Profinet and new motor design

The most compact frame size FSA of the Sinamics V90 converter is now available as Profinet version for 200-V supply voltage. The Profinet version for 0.1 up to 0.4 kW was previously covered by frame size FSB. Today, frame size FSA covers the Profinet versions for 0.1 and 0.2 kW. This reduces space requirements by 10 mm (18%). Additionally, the Profinet interface enables real-time transmission of user, process and diagnostic data with a single cable.

The motor design for Simotics S-1FL6 (SH45, SH50, SH65, SH80) was also innovated. The connections on the motor side are now angled, while those on the cable side are straight connections. This results in a more compact motor design and provides for better connectivity. ∎

↗ **siemens.com/sinamics-v90**

NEW FEATURES

- Space-saving Profinet version for 200 V
- Real-time data transmission with a single cable
- Compact design of Simotics S-1FL6 motor for better connectivity

Safety Lib V3.0 / Advanced Position Control

# More performance for modern storage and retrieval machines

Ever-shorter commissioning times, faster storage and retrieval, and highly dynamic travel operations – these are the essential requirements placed on modern storage and retrieval machines. They should also reduce energy costs, without sacrificing operational safety. Siemens offers a variety of customized solutions and products to help users find the optimal solution for these seemingly contradictory requirements.

The TÜV-certified and time-tested Safety Library (Safety Lib), developed specifically for storage and retrieval machines and now available in version 3, enables considerably faster commissioning and reduces CPU utilization significantly. The new Advanced Position Control technology facilitates even faster storage operations. It permanently prevents mast vibrations without additional sensors – even when the vibration behavior varies (e.g., due to varying load conditions). This function is the perfect addition to the new Simotics S-1FG1 servo geared motors which, thanks to external fans, now also enable more dynamic travel operations in the upper power output range.
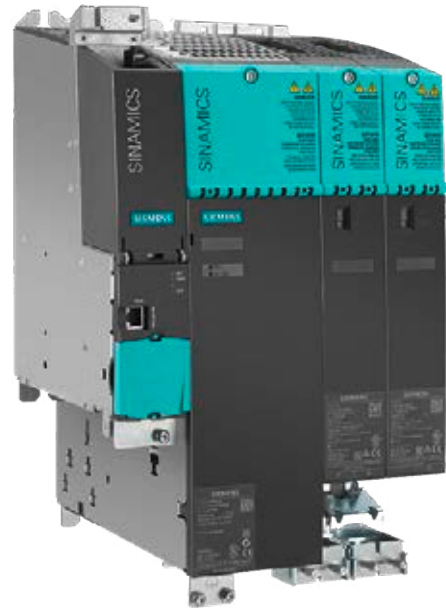
The new Simatic component for energy-optimized travel ensures that energy costs can be lowered in spite of the increasing dynamic response. ■

↗ **siemens.com/conveyor-technology-srm**
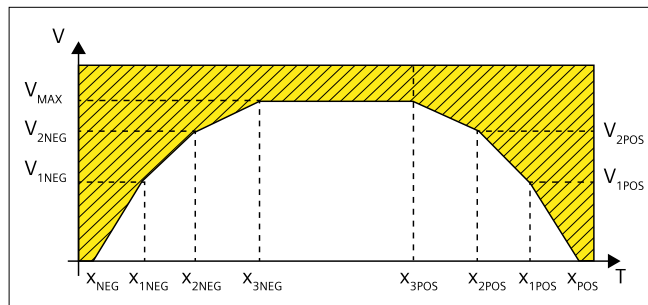
NEW FEATURES

- Faster safety commissioning with Safety Lib V3.0
- Faster storage and retrieval with APC technology
- New Simotics S-1FG1 servo geared motors for increased performance
- Lower energy costs due to energy-optimized travel profiles

Sinec NMS

The new generation of network management

Sinec NMS, the new network management system (NMS) from Siemens, meets the high demands placed on communication networks in Industry 4.0. It can easily handle large quantities of data and complex network structures.

As plants become increasingly networked, the volume of data is growing correspondingly. With Sinec NMS, Siemens is offering a network management system specially designed for the digital future. Two overarching elements – System Administration and Northbound Interface – make Sinec NMS the optimal solution for the requirements of industrial networks. These elements enable centralized, user-friendly monitoring, management, and configuration of 50 to 12,500 devices. Users have round-the-clock access to at-a-glance information on the current diagnostic status of all devices in the network – ensuring maximum transparency on the complete architecture of the industrial network. Sinec NMS makes it easy to integrate new components in the network and to configure and maintain existing devices on a continuous basis. The policy-based configuration (based on defined rules applied across a specific selection of components) generates considerable time savings when configuring network devices and troubleshooting, especially in large networks with a great number of devices.

Two levels for greater flexibility
The decentralized approach of Sinec NMS makes it easy to adapt flexibly to a wide variety of plant networks. If required, it can even easily map large quantity structures with up to 12,500 devices. To this end, the system is divided into two levels: control and operation. Control is the central instance in Sinec NMS. This level displays a quick status overview of the entire network and allows users to manage operations. These, in turn, are distributed within the network, where they take the configuration requirements from the control level and implement them on all devices.

The five pillars of fast fault detection
As a modern network management system, Sinec NMS covers all five pillars of the FCAPS model defined by the International Organization for Standardization (ISO): fault management for fast and easy fault localization; configuration management to reduce the time and work involved through centralized configuration and maintenance of the whole network; accounting management for security based on network testing and reliable documentation of events; performance management for flexibility based on network optimization, transparency based on the statistics generated, and high availability based on permanent network monitoring; and security management for increased network security. ◾

↗ **siemens.com/sinec-nms**

Industrial Communication

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

NEW FEATURES

- Managed Industrial Ethernet switches for high-performance networks
- Up to eight electrical and two optical ports with a bandwidth of 1 Gbit/s
- Approval for trackside rail applications

Scalance XC-200G

Gigabit switch for high bandwidths

The new Gigabit versions of the Scalance XC-200 Industrial Ethernet switches are perfect for building high-performance network infrastructures. In addition to the existing configurations (up to 24 electrical and two optical ports), there are now versions available with eight RJ45 ports or six RJ45 ports and two optical ports with a data rate of up to 1 Gbit/s. While the Scalance XC-200G devices are ideally suited for conventional automation tasks, they are primarily designed for applications involving broadband-intensive communications, such as traffic infrastructure applications and height monitoring in tunnels. However, they are also ideal for use in production, where they can reliably transmit video recordings directly to the MES level for precise documentation of production batches. The Gigabit versions come with Profinet and Ethernet/IP diag-

nostics for integration in various automation solutions. Features such as H-Sync support are available for use in high-availability control concepts.

The Scalance XC-200G devices have a design identical to that of Simatic S7-1500 as well as reduced port depths, making them perfect for installation in control cabinets. Permanent monitoring of the fiber optic segment increases the reliability of data communications and helps avoid plant downtimes. ■

↗ **siemens.com/xc-200**

Corresponding Sitrain offer: IK-SWIROS siemens.com/sitrain-ik-swiros

IE FC M12 Plug PRO plug connector

Easy-to-assemble plugs

With the FastConnect cabling system, users can choose between cables that come in various preferred lengths or cables sold by the meter for local assembly. The new X-coded IE FC M12 Plug PRO plug connector with its robust metal enclosure is IP65/67 compliant and makes it easy to quickly assemble custom-length eight-wire Ethernet cables directly on site. The cables can be stripped and installed as usual, using the IE FC Stripping Tool,

so there is no need to learn new assembly methods. Making cables designed for data rates of up to 10 Gbit/s is easy: Simply insert the wires of the eight-wire IE FC TP cables into eight small openings in the plug. Then use the integrated insulation displacement system to cut them to length and complete the contacts by assembling the two parts of the enclosure. ■

↗ **siemens.com/fastconnect**

NEW FEATURES

- Robust, X-coded M12 plugs with IP65/67 degree of protection
- FastConnect system for quick local assembly
- Integrated portfolio of FastConnect cabling technology

Scalance SC-600

Effective protection for plant networks

The Scalance SC-600 industrial security appliances have been extended with new functions to allow users to implement special security concepts. They provide effective protection for machine and plant networks at the field and aggregation levels. The bridge firewall function makes it possible to implement protective firewall mechanisms even in flat networks. For example, users have direct and local access to automation components in Profinet cells without sacrificing protection against unauthorized access. The new support for the Media Redundancy Protocol (MRP) enables the integration of Scalance SC-600 in the Profinet ring redundancy – as an MRP client without an additional managed Industrial Ethernet switch. If there is a ring interruption, all network components in the ring switch to the redundant path within 200 ms, thus preventing production standstill in the event of a fault. In addition to supporting MRP, the security components also support Virtual Router Redundancy Protocol (VRRP) for Layer 3 redundancy. The new, user-friendly function of user-specific firewalls enables the configuration of firewall rules for individual accesses. ◼

↗ **siemens.com/scalance-s**

Corresponding Sitrain offer: IK-SECIN-S siemens.com/sitrain-ik-secin-s

NEW FEATURES

- Bridge Firewall for protecting flat networks and implementing service bridge applications
- Support of the MRP, HRP and VRRP function for implementing redundancy applications
- User-specific firewall for implementing individual protective measures

NEW FEATURES

- S2 system redundancy in all Profinet network topologies
- Changes to configurations during ongoing operation
- Flexible and reliable networking of devices in process automation

Scalance XF-200BA, XC-200EEC, XP-200EEC

Robust switches for the process industry

The Scalance XF-200BA, XC-200EEC, and XP-200EEC Industrial Ethernet managed Layer 2 switches have special hardware characteristics and new firmware functions to allow for flexible, reliable, and high-performance networking of devices in the process industry. The switches have coated printed circuit boards (conformal coating), an expanded temperature range from −40°C to +70°C, an installation altitude of up to 4,000 m, and conformity with NAMUR NE21. All these features make them suitable for use even in harsh environments, for example in the oil and gas or food and beverage industries. All product lines have functions that are primarily required in pharmaceutical and chemical applications, such as Configuration in RUN (CiR/H-CiR) to update Industrial Ethernet switches during ongoing operation, for example. The S2 device function makes it possible to run and monitor all devices on a Simatic S7-400H CPU. This can be coordinated perfectly with the Simatic PCS 7 process control system.

Scalance XP-200EEC, with IP65 degree of protection, copper ports, and robust M12 plugs, is predestined for use without control cabinets, while Scalance XF-200BA and XC-200EEC have RJ45 and fiber optic ports that offer the possibility of establishing flexible topologies. Scalance XC206-2SFP EEC can bridge distances of up to 200 km. Equipped with bus adapters for larger cable lengths (VD bus adapters), Scalance XF204-2BA allows S2-capable devices at distances of up to 1,000 m to be connected to a Simatic S7-400H system. Scalance XF204-2BA DNA also allows users to integrate S2 devices in a high-availability R1 system. ◼

↗ **siemens.com/switches-for-pa**

Scalance M804PB

Remote access to Profibus systems

The new Scalance M804PB industrial router allows machines, plants, and automation devices to be connected to Ethernet networks via Profibus/MPI. This means that older machines and plants can also be easily and economically connected to the Sinema Remote Connect management platform. A VPN tunnel is used for secure communication. Thanks to integrated TIA Portal Cloud Connector functionality, users can now also easily access centrally administered engineering tools such as TIA Portal or Step 7 (version 5.6 and higher) on existing Profibus systems.

The Scalance M804PB Profibus/MPI router has two RJ45 interfaces in the form of a fast Ethernet two-port switch and a slot for C-Plug/Key-Plug.

It supports VLAN, firewall/VPN (IPsec)/NAT, OpenVPN (as the client), and VRRP/RSTP, and can be configured via web-based management, CLI, and SNMP. Scalance M804PB has the same firmware basis, the same user interface, and comparable performance characteristics to Scalance M-800 and S615. This ensures easy handling and compatibility with existing systems, as well as simplifying remote access to existing plants, for example for remote maintenance. ■

↗ **siemens.com/scalance-m**

NEW FEATURES

- Connection of existing machines and plants with Profibus and MPI (Multi-Point Interface)
- Secured remote access via the Sinema Remote Connect management platform
- TIA Portal Cloud Connector connection
- Suitable for use in industries such as automotive, food and beverage, chemical, and pharmaceutical

NEW FEATURES

- Integrated GPS functionality for localization and time synchronization
- Extension board for connecting eight additional sensors via Modbus RTU
- Four additional DO, designed as fast solid-state relays

Simatic RTU3031C

Measuring point monitoring with GPS functionality

Simatic RTU3031C is a compact remote terminal unit that enables positioning via GPS and monitors remote measuring points – even when there is no local power supply in the remote location. The remote terminal unit (RTU) is optimized for low-power operation and is powered by up to six battery modules or a battery with a solar panel. The RTU can also supply power to connected sensors. Like the entire Simatic RTU3000C family, RTU3031C is also suitable for use in harsh environmental conditions (−40°C to +70°C) or in flooding (with external IP68 protective enclosure). The new extension board allows up to eight additional sensors to be connected via Modbus RTU. This benefits users from a wide range of different industries who want to take advantage of additional information from the sensors (e.g., diagnostic information). The collected data are transmitted to a control center via an integrated UMTS/3G modem in chronological or event-based order. The control center is connected via various telecontrol protocols. The device is also suitable for use as a data logger. Measured process values are stored in the internal memory or on an SD card and can be read out remotely via web-based management or sent to defined partners via secure file transfer or e-mail. An integrated GPS receiver enables positioning and time synchronization. ■

↗ **siemens.com/rtu3000c**

Simatic TIM 1531 IRC V2.0

More flexibility through open telecontrol protocols

Remote terminal units (RTUs) based on the Simatic S7-1500 Advanced Controller impress users with their high performance and flexibility. The RTUs are particularly well-suited for complex telecontrol applications. They are connected to a telecontrol center via the TIM 1531 IRC telecontrol interface module using a telecontrol protocol. The telecontrol interface module (TIM) can also be used as a node or as a master station.

With the new V2.0 firmware, TIM 1531 IRC now also supports the open IEC 60870-5-101/104 and DNP3 telecontrol protocols in addition to the Sinaut ST7 telecontrol protocol – the telecontrol protocol is simply selected in TIA Portal V15.1 during configuration. The new proxy functionality simplifies the use of new RTUs that are based on Simatic S7-1500 in existing telecontrol systems. Sinaut V5.5 SP3 engineering software can be used to create and export the

NEW FEATURES

- Free choice of telecontrol protocol in a wide range of telecontrol applications (Step 7 Professional V15.1 and higher in TIA Portal)
- Suitable for use as a substation (RTU), node, or master station
- Proxy function in Sinaut V5.5 SP3 engineering software for configuring connections in Step 7 V5.5 with import function in TIA Portal V15

connection configuration of new stations with TIM 1531 IRC modules in the existing project. These can then be imported into Step 7 Professional in TIA Portal (V15 or higher). ∎

↗ **siemens.com/telecontrol**

Sinema Remote Connect V2.0

Dedicated, secured remote access

NEW FEATURES

- Dedicated device access (DDA) for user-specific access to unique IP addresses in the subnet
- More user-friendly and efficient due to clear and intuitive user interface

The new version 2.0 of Sinema Remote Connect, the management platform for remote networks, provides dedicated, secured remote access to machines and plants with a customizable user interface. It is a user-friendly means of controlling individual machines in subnets via VPN. Dedicated device access (DDA) allows user-specific access rights for dedicated devices in the subnet to be centrally stored in the role and rights management of Sinema Remote Connect Server. This makes it possible to determine exactly which user is allowed to access which IP addresses in the subnet behind the respective VPN endpoint (e.g., Scalance M-800 industrial router). This, in turn, cuts down operator errors resulting from access by unauthorized personnel. Each machine within the subnet can be unambiguously identified because the connections within the subnet that are released for the individual user are displayed clearly in

Sinema RC Client with dedicated IP addresses and device names. This makes the process of establishing connections to the machine even faster and more user-friendly.

The user interface of Sinema Remote Connect Server and Client has been optimized in version 2.0. New customization options, such as displaying, hiding, and moving individual columns in the client, provide a clearer view of the relevant information. The settings are stored in the user profile. ∎

↗ **siemens.com/sinema-remote-connect**

Corresponding Sitrain offer: IK-REMOTES siemens.com/sitrain-ik-remotes

Ruggedcom RSG908C/RSG910C

Precision timing information and data communications

Two new compact rugged Ethernet switches have just been added to the Ruggedcom portfolio. The IEEE 1588-compliant Ruggedcom RSG908C and Ruggedcom RSG910C devices reduce the total cost of ownership by combining precision timing information and data communications in a single network. These two new switches come with an integrated DIN rail mounting and front-facing interfaces for easy installation in space-limited areas. Tested and certified to withstand extreme temperatures, shocks, and vibrations, Ruggedcom RSG908C and RSG910C offer exceptional reliability for industrial applications that require high bandwidths and accommodate future network expansions. Both devices offer either a 24/48 VDC low-voltage power supply (10 – 60 VDC) or a high-voltage power supply (85 – 264 VAC / 88 – 300 VDC) depending on the configuration. The redundant power inputs for both DC and high-voltage AC/DC applications can eliminate a single point of

Ruggedcom RST2228/RST2228P

Handling growing volumes of data

Siemens is expanding its Ruggedcom portfolio with new Ethernet 19" rack switches. Their high port density significantly lowers capital expenses by reducing the number of required network devices. The combination of communication functions and precision timing in a single network eliminates additional maintenance costs related to timing solutions that require dedicated wiring.

Ruggedcom RST2228 is a rugged Layer 2 rack switch with 4 integrated 1/10 Gbit/s uplinks and up to 24 field modular 10/100/1000 Mbit/s interfaces supporting IEEE 1588 Transparent Clock. Ruggedcom RST2228P comes with Power-over-Ethernet – according to IEEE 802.3bt (draft) – and supports up to 24 devices with

a combined power of 500 W with a maximum of 60 W per port.

The CLP interface port allows for easy replacement of devices in the field using Ruggedcom CLP removable media to automatically apply the failed device's configuration to a replacement unit in the unlikely event of a failure.

Thanks to its rugged design, Ruggedcom RST2228/RST2228P feature an operating temperature ranging from −40°C to +85°C, as well as immunity to electromagnetic interference. The Ethernet switches can be used in the harsh environments of electric power, transportation, and the oil and gas industries, and is ideal for handling ever-growing volumes of data.

The devices can be ordered preconfigured with modules installed, but can also be combined with separately available media modules for quick in-field setup and modifications. This enables simplified migration from copper to fiber optic networks – one of the major challenges of digitalization. Further savings can be generated by purchasing only the necessary modules for RST2228 to meet the immediate needs with room for future growth. ▪

↗ **siemens.com/rst2228**

Industrial Networks Education
siemens.com/
industrial-networks-education

- Eliminate single points of failure with redundant power inputs
- Winner of the prestigious Red Dot Design Award
- Ideal for digital substations, transportation, and the oil & gas industries

failure. The Ruggedcom RSG908C switch has a total of eight ports including 4-Gigabit SFP ports providing ultimate flexibility in the choice of fiber optics and the distance to be spanned. It can connect up to four devices, such as IEDs via its 100BASE-FX LC ports. Ruggedcom RSG910C has a total of 10 ports including 4-Gigabit SFP ports and can connect up to six devices via its 10/100/1000BASE-T RJ45 ports.

Ruggedcom RSG908C and RSG910C can be used for precision time synchronization in the electrical power industry, for high-bandwidth applications such as video streaming in the transportation industry, and for time-critical applications such as drilling automation, SCADA (Supervisory Control and Data Acquisition) and RTU (Remote Terminal Unit) solutions in the oil and gas industry. ■

↗ **siemens.com/rsg900c**

- Simplifies migration to high-bandwidth fiber optic networks
- Easy replacement of field devices using Ruggedcom CLP removable media
- Supports Power-over-Ethernet (PoE++) for up to 60 W per port

Ruggedcom RX1400 with CloudConnect

Data transfer to cloud-based applications

The Ruggedcom RX1400 cellular router is now available with the Siemens CloudConnect IIoT gateway solution for data acquisition, filtering, conversion, and communication with cloud-based applications, including those hosted on MindSphere, the cloud-based, open IoT operating system. When using Ruggedcom RX1400 with CloudConnect, it is now possible to easily and reliably pull data from Modbus TCP- and S7-based devices and to preprocess them prior to transfer to MindSphere or any cloud solution that supports the industry-standard MQTT protocol.

The router's multifunctional capability allows end devices to connect via wireless LAN, serial, copper Ethernet or fiber Ethernet connections. The connection to the cloud can be set up with redundant paths, either via LTE or copper/fiber Ethernet, and users benefit from the high bandwidth connectivity to remote locations. Proven reliability and the ability to function in extreme temperatures from $-40°C$ to $+85°C$ and in harsh environments make Ruggedcom RX1400 with CloudConnect an ideal choice for IIoT data acquisition in industrial applications such as electrical power, transportation, and oil and gas. ■

↗ **siemens.com/cloudconnect**

- Plug-and-play router for IIoT data transfer to cloud-based solutions
- Trigger management for event-driven and cyclic communication
- High bandwidth connectivity to remote locations

Simatic RTLS

The locating platform for the Digital Enterprise

Simatic RTLS (Real-Time Locating System) makes it possible to navigate material flows, control mobile robots, monitor the use of components, and fully document the assembly of the end product. This makes Simatic RTLS a key component of tomorrow's digital factory.

Companies that improve the dynamics of their production and logistics workflows can respond more swiftly to market changes, optimize capacity utilization or manufacture smaller batches. Based on the Simatic RTLS locating platform, flexible, self-organizing production and logistics concepts are essential. Locating and tracking objects of virtually any type in real time is useful for controlling production and material flows. It allows companies to monitor the use and condition of valuable assets at all times and to systematically optimize stock quantities, utilization, and maintenance procedures.

Maximum accuracy, scalable infrastructure
Simatic RTLS handles locating tasks that require a high degree of accuracy – in both indoor and outdoor environments. The system is suitable for locating and recording large populations of objects.

System solutions based on the Simatic RTLS locating platform consist of active transponders, infrastructure devices, like Anchors and Gateways, and a license-based locating server. The transponders are fitted to the objects that need to be located. Gateways and Anchors record the transponder signals and transmit them to the locating server, the Simatic Locating Manager. The server calculates the real-time position of the individual transponders and passes the data on to higher-level systems.

A system solution like this can be scaled at any time, either by expanding the existing locating infrastructure with additional applications or by extending the area that needs to be covered. All devices can be easily installed. An ISO standard interface is available for integration into an IT system.

Comprehensive portfolio for a wide variety of applications
To ensure optimal compatibility with different applications, several product families have been optimized for specific applications. In particular, Simatic RTLS4000 was developed for automation tasks in production. Available products include rugged infrastructure products as well as a large selection of transponders for locating containers, pallets, workpiece carriers, tools, and forklifts.

Users receive extensive support in planning, installing, and commissioning a locating infrastructure with Simatic RTLS. It allows a smooth implementation of customized solutions across the globe. ∎

↗ **siemens.com/simatic-rtls**

Industrial Identification and Locating

Industrial processes in Digital Enterprises demand complete transparency. Recording and processing data at strategically relevant points is a crucial factor for long-term commercial success. Key technologies in this area are industrial identification and real-time locating systems (RTLS).

- Scalable portfolio with models for connecting one, two, or four readers
- Web-based management and TIA Portal for round-the-clock secured access to configuration, commissioning, and diagnostics tools
- Cloud connection via OPC UA interface and Industrial IoT gateway, for example Ruggedcom RX1400 with CloudConnect
- Modular systems integration for Profinet using standard function blocks

Simatic RF18xC

Paving the way for HF-RFID cloud connection

A new series of Simatic Ident communication modules comes with a significantly expanded range of features and a modern design: Simatic RF185C, RF186C, and RF188C, all of which can be connected and operated via Ethernet/Profinet. Users have the option of connecting one, two, or four readers in order to ensure a match to the required number of readers. The new communication modules are fully compatible with the predecessor model Simatic RF180C in terms of functionality and programming, eliminating the need to adapt the existing application software. The application can run at the field level using a controller, on the IT level or directly on a PC.

The RF18xC communication modules support OPC UA as an IoT interface, and communicate via the data model of the OPC UA AutoID Companion Specification V1.0. This enables vendor-independent communication within the automation and a standardized connection of the communication modules to cloud applications, such as MindSphere, the cloud-based, open IoT operating system from Siemens, via an Industrial IoT gateway. Connecting HF-RFID systems such as Simatic RF200 and RF300 to the cloud opens up completely new possibilities for harnessing the data obtained from the RFID transponders. Operational resources such as containers or pallets , that previously could not be mapped digitally, can now be identified and tracked. Analysis of the data transmitted to the cloud supplies vital information about KPIs such as plant availability and the utilization of assets, thus making a valuable contribution to process optimization.

With two connections each for Ethernet and power supply, the new devices support both star and line topologies as well as ring topology. In line topologies, the standardized L-coded M12 connectors for the power supply allow a high transmission current of up to 16 amperes. Users can still access configuration, commissioning, and diagnostics tools in the time-tested way via TIA Portal, but now they can also access these tools via web-based management.

Simatic RF18xC can be deployed anywhere Simatic Ident RFID readers are used. Depending on the application, data throughput can be increased by up to 20% using the new devices. Their particularly compact design and high protection rating of IP67 enables them to be used in harsh industrial environments and wherever space is restricted. ∎

↗ siemens.com/communication-modules

Simatic RF615R

Particularly compact UHF-RFID reader

The reader supports OPC UA as an interface to the IIoT world and communicates via the data model of the OPC UA AutoID Companion Specification V1.0. This enables vendor-independent communication within the automation and a standardized connection to cloud applications, such as the cloud-based, open IoT operating system MindSphere via an Industrial IoT gateway such as Ruggedcom RX1400 with CloudConnect. This opens up completely new possibilities for harnessing current production data and makes KPIs available around the world.

Quick and easy access to configuration, commissioning and diagnostic tools takes place in the reliable customary way via a web browser. In-process diagnosis and the diagnostics history in the logbook increase plant availability. Due to the proven "UHF for Industry" algorithms, users benefit from extremely high reliability even in environments with poor radio signals.

The modern design of Simatic RF615R is evident in the LED status display, which encircles the housing for good visibility from all sides. The reader is used primarily in mechanical and plant engineering, as well as in conveyor technology, where compact dimensions and short read ranges of up to one meter are required. Due to its high protection rating of IP67, Simatic RF615R can also be used in harsh industrial environments. ■

NEW FEATURES

- Particularly compact design at 133 x 155 x 45 mm
- Internal, circularly polarized antenna and an additional external antenna connection
- Proven "UHF for Industry" algorithms
- Cloud connection via OPC UA interface and Industrial IoT gateway, for example Ruggedcom RX1400 with CloudConnect

The new read-write devices of the Simatic RF600 ultra-high frequency (UHF) family are notable for their exceptionally compact design. Simatic RF615R, which is the first device that will be launched, measures 133 x 155 x 45 mm. The reader comes wit an internal, circularly polarized antenna and an additional external antenna connection. Using the connection for the additional external antenna, it is possible to set up a cost-efficient small-scale RFID gate. Thanks to the circularly polarized antenna, the mounting position can be adapted individually to the conditions on site.

With both a digital input and a digital output, the Simatic RF615R offers a simple trigger option for distributed read points as well as local response to reading events.

↗ **siemens.com/rf600**

Simatic RF682T

When things get hot

- For applications with high temperatures of up to max. +220°C
- Large 256 bit EPC and 3,072 bit user memory
- Can be mounted directly on metal with a read range of up to 3.5 m

The Simatic RF600 ultra-high-frequency (UHF) product family now includes a new heat-resistant transponder. The silicone-free, chemical-resistant Simatic RF682T transponder can can be used problem-free at temperatures of up to 220°C. This level of heat resistance combined with its high degree of protection of IP68/IPx9K makes this transponder suitable for use in the harshest industrial environments with high temperature exposure such as laundries and paint shops.

The new Simatic RF682T is based on the ISO 18000-63 standard and comes with 32 byte Electronic Product Code (EPC), plus 384 byte user memory. This makes the transponder suitable to be written on with a large number of data and to be used for both centralized and decentralized data management.

The transponder can be mounted directly on metal and has a read range of up to 3.5 m. Thanks to its broadband design, it is suitable for use in numerous countries. Simatic RF682T can be recorded by the proven RFID readers of the Simatic RF600 portfolio. ■

↗ **siemens.com/transponder**

Simatic RF1070R

Controlled access

- Now also compliant with the Legic Prime and Legic Advant standards
- ATEX approval
- Individual control of access rights using existing employee ID cards
- Prevention of misuse thanks to secured, documented access to machines
- Setting up the readers for customer-specific parameters using the configuration card (Config card)

Companies that use employee ID cards based on the Legic Prime and Legic Advant standards can now control access to machines and plants with the Simatic RF1000 HF system, thanks to the new Simatic RF1070R reader. The new reader also of course complies with the ISO 14443 A/B (Mifare – contactless chip card technology) and ISO 15693 standards like the proven Simatic RF1060R to individually controll access to plants and machines. Operating personnel can thus be identified and access to machines can be documented. Like all readers of the Simatic RF1000 series, Simatic RF1070R features a USB interface and can be integrated into software applications running under Windows 7, 8, and 10 and into existing hardware solutions such as HMIs (Human Machine Interfaces) or panels and control infrastructures. In addition, the new reader also comes with a serial RS232 interface as standard, allowing it to be fast and easily linked to the Simatic RF170C communication module, a Simatic ET 200SP distributed I/O module, and PCs.

To set up the readers for customer-specific parameters, users can purchase a configuration card (Config card). User data can now be written to the employee ID cards in addition to reading the UID. Another new feature for RF1000 readers is ATEX approval, which allows them to be operated in Ex (potentially explosive) zones. Thanks to its high protection class, the compact devices are suitable for use in harsh industrial environments at temperatures ranging from –25°C to +55°C. ■

↗ **siemens.com/rf1000**

Simatic MV540

Reliable reading under challenging conditions

Siemens is introducing Simatic MV540, the first optical reader in its new Simatic MV500 series of high-end readers. It offers significantly more functionality and performance than its predecessor, Simatic MV440, but still remains compatible with it. The device's higher computing power accelerates the reading process. More in-depth evaluation of image information improves read reliability, even under the most adverse conditions.

High-performance accessories such as lenses with electronic focus and flexible-control built-in ring lights, increase functional reliability, and – thanks to the increased working distance – expand application options. In addition, the electronic focus function reduces setup errors and downtimes. Device configuration via web-based management, the integration into TIA Portal and one-button configuration for network and reading parameters make Simatic MV540 particularly easy and convenient to use. The Simatic MV540 optical reader can also connect securely to MindSphere, the cloud-based, open IoT operating system from Siemens, via the Simatic S7-1500 controller and the CP1543-1 communications processor. This connectivity is made possible by a function block integrated in the S7 controller. Operating data, such as product ID and quality data with position and time, can be recorded so that the tracking results are available globally. Analyzing these data makes production and logistics processes transparent, regardless of the manufacturer. This optimizes production processes and supply chains, and boosts efficiency and quality in production, logistics, asset management, and other areas.

With its high degree of protection (IP67) and compact design, the Simatic MV540 optical reader is ideally suited for use in harsh industrial environments and in confined spaces. Thanks to its modular design, it can be flexibly adapted to a wide variety of application requirements. ◼

↗ **siemens.com/optical-identification**

NEW FEATURES

- Highest reading performance of 1D/2D codes with up to 80 reads per second
- Powerful and flexible accessories (lighting, optics)
- Ease of operation thanks to one-button configuration
- Easy and secure connection to MindSphere via standard function block in the Simatic S7-1500 controller, and the CP1543-1 communications processor

Control perfection

Controls – primed for digitalization

Siemens is continually updating the entire Sirius portfolio to ensure that panel and machine builders can reliably meet current and future industry requirements and exploit the opportunities that advances in digitalization are opening up.

Protecting, switching, monitoring – virtually nothing in industry happens without industrial controls. Siemens has been working continuously to enhance individual product details and integrate unique functions into the Sirius portfolio that create a comprehensive, well-thought-out system. As part of Totally Integrated Automation (TIA), the Sirius portfolio contributes to the digital transformation of industry. The completely revised portfolio consists of four essential components:

Sirius Control – everything for switching and protection

With seven sizes up to 250 kW and numerous additional functions, Sirius Control offers the largest switching and protection portfolio on the market. The completely innovated generation of devices has over 50,000 tested and approved combinations for worldwide use. Universally available CAx data simplify and speed up the electrical design process.

Sirius Hybrid – everything for optimal motor starting

Sirius Hybrid offers the right device for starting motors for any purpose. The scalable portfolio has particularly compact sizes, which are also available as fail-safe versions in the same sizes. Always included: the energy-saving, low-wear hybrid technology that ensures long-lasting devices with a robust finish.

Sirius Monitor – everything for monitoring and reacting

Sirius Monitor devices make it easy to maintain a plant overview, improving availability through data analyses and preventive maintenance. The modular solutions can be flexibly expanded with minimal engineering and training. Sirius Monitor meets international standards and all machine safety standards.

Sirius Command – everything for commanding and signaling

The Sirius Command range has been designed down to the smallest detail to meet the specific requirements of many industries. The rugged products have an attractive modern design and function even under the most adverse conditions. They are also exceptionally easy to work with, especially during installation. Users can integrate communication interfaces flexibly and without additional expense.

Additional services

An important additional feature of the Sirius portfolio is the expert know-how available to users at any time to answer questions about frequently changing standards, the latest design data (CAx data), and open interfaces, and to provide perfect support on all issues relating to control panel building. This equips electrical designers to build the perfect control panel for their customers in every respect – from design to function to economical implementation. ◾

↗ **siemens.com/control-perfection**

Industrial Controls

With Sirius Control, Sirius Hybrid, Sirius Monitor, and Sirius Command, Siemens offers a coordinated portfolio for industrial controls that is easy to install in the control cabinet and straightforward in its integration into distributed I/O systems.

Sirius Hybrid: Simulation tool for 3RW soft starters (STS)

The right soft starter for every application

Sirius 3RW soft starters are the best solution when direct or star-delta starting doesn't apply to three-phase motors. These starters avoid the problems that often arise due to mechanical impact in the machine or voltage drops in the line supply. New additions to the portfolio are the 3RW52 and 3RW55 three-phase soft starters, which cover a power range from 5.5 kW to 560 kW. Integrated functions such as automatic parameterization, condition monitoring, special functions for pump cleaning and controlled pump stopping (to avoid water hammer), and brake functions help ensure reliable operation.

Siemens makes it easy to select a product quickly with the Software Simulation Tool for Soft Starters (STS). Depending on the application requirements, users can choose the right soft starter from various performance classes and customize it with standard accessories (e.g., operating blocks, communication modules). STS also allows users to simulate a soft starter application based on information such as environmental conditions and the power supply, motor, load, and functions of the soft starter. The software is available in a Windows version, but it can also be downloaded as an app (for Android and iOS) for convenient selection via mobile devices. ■

↗ **siemens.com/soft-starter**

Sirius Monitor: Sirius 3RQ2 coupling relays

User-friendly connection technology and wide-range input

NEW FEATURES

- Universal application: one product for all control voltages from 24 V to 240 V AC/DC reduces the number of variants
- Standardized enclosure design and permanent wiring with removable screw-type and push-in terminals
- International standards and certifications, including CE, UL/CSA, EAC, with approvals for rail operation

The new Sirius 3RQ2 coupling relays have a wide-range supply voltage of 24 V to 240 V AC/DC that makes them suitable for universal application. They are available in variants with one to three changeover contacts. The new, high-grade industrial-duty enclosure in titanium gray blends in visually with the rest of the Sirius relay family. The user-friendly connection technology with removable terminals offers advantages in handling, installation, servicing, and wiring. Typical applications include galvanic isolation, signal amplification, and voltage conversion as well as overvoltage and electromagnetic compatibility (EMC) protection. The Sirius 3RQ2 coupling relays replace the 3RS18 series. Changeovers are quick and easy to implement thanks to identical terminal assignments and a reduced number of variants. ■

↗ **siemens.com/relays**

Sirius Monitor: Simocode pro motor management

Redefining dry-run protection for pumps

When pumps are used to transport flammable media into hazardous areas, safety is the first priority. This makes reliable dry-run protection a must. The new Simocode pro active power-based dry-run detection from Siemens is something the market has never seen before. The motor management system monitors the active electrical power consumption of the pump motor to determine the status of the pump. If the flow rate decreases, the active power consumption of the pump motor decreases as well. If the active power consumption, and thus the flow rate, falls below a minimum value the pump is automatically shut off.

The active power is detected via special current/voltage detection modules which are approved for use as monitoring devices to protect pumps installed in hazardous zones against dry running. Sensors that are usually used to monitor dry running of the pump are no longer required.

NEW FEATURES

- Earlier fault detection due to active power monitoring
- Elimination of additional sensors, mechanical components, and their maintenance
- ATEX- and IECEx-certified

When determining the limit values to be monitored, the user is supported by a menu-guided teach-in process in the engineering software. ■

↗ **siemens.com/simocode**

Electrical power distribution in the Digital Enterprise

In today's marketplace, electrical power distribution needs to be seamlessly integrated in digital environments. That begins with the electrical engineering based on digital twins, and includes the integration of communication-capable components in automation systems and finally the detection of power and plant data and their provision in MindSphere, the cloud-based, open IoT operating system from Siemens. Such measures increase operational energy efficiency and plant availability, optimize operational workflows and maintenance, and simplify the entire value chain.

The technical basis for smooth interaction of hardware and software with systematic data management consists of communication-capable protection, switching, and measuring devices. These devices provide the transparency on plant statuses and consumption values necessary for digital infrastructures – and thus form the basis for efficient, safe processes. Users can optimize electrical distribution for automated operational, machine, and process workflows by directly integrating the components in TIA Portal and in the Energy Suite in TIA Portal. This ensures a consistently safe and flexible power supply and a generally simplified engineering process. Data on current, voltage, and power can be used for detailed evaluations and systematic management of processes in automation. This allows users to identify faults at an early stage, take preventive measures to avoid outages, and increase the overall energy efficiency of operations. If the data are integrated in a cloud-based, open IoT operating system such as MindSphere, they will also be available in the cloud for specific evaluations, for example to assess plant status and the power quality, and to optimize power consumption.

Higher plant availability thanks to a digital twin
Connecting the electrical power distribution to a digitalized infrastructure starts with the main low-voltage distribution. The Sivacon S8 switchboard and the installed communication-capable protection and switching devices do more than just enable fail-safe, efficient power distribution. Components such as the 3WL circuit breakers, 3VA molded case circuit breakers, and measuring devices from the Sentron portfolio also contribute to precise capturing of energy data. Another important element of the switchboard is Simaris control – the digital twin of Sivacon S8. Simaris control can be used to operate, monitor, and parameterize all components digitally. The resulting data, such as status information and energy data, can then be transmitted to higher-level automation and energy

management systems as well as cloud-based analysis systems such as MindSphere. This increases plant availability through continuous monitoring and predictive maintenance. The new Health Status function also records switching cycles and short-circuit breaking events for each feeder in order to determine the switchboard status. ∎

↗ **siemens.com/lowvoltage/digitalization**

HIGHLIGHTS

Simaris control
- The digital twin of the Sivacon S8 switchboard
- High switchboard availability through health status functionality

Sivacon S8
- For on-site diagnostics or in IoT systems
- Extended active protection against internal arcing for a higher level of personnel and switchboard safety
- Higher power through energy-efficient cooling for reliable operation
- Optimum use of space with 300-mm-high small withdrawable units
- Powerful motor management systems for high flexibility and reliability
- Modular design, flexible frequency converter panel

Sivacon S8 low-voltage switchboard

Safe power distribution, intelligent management

To master the challenges of the digital world, today's electric power distribution systems not only deliver power, but also data. The Sivacon S8 low-voltage switchboard with the integrated Simaris control diagnostics station supports the connection to the digital industrial environment. Simaris control, the digital twin of Sivacon S8, enables all components to be digitally operated, monitored, and parameterized. Status information and measured values are presented clearly, creating high transparency all the way to the individual feeders. The power requirements of the low-voltage application can be analyzed and optimized through the consumption values of the feeders. Modifications in the switchboard can also be reproduced in the digital twin. Health Status, the new function of Simaris control, captures switching cycles and short-circuit breaking events, thus allowing users to determine the switchboard status. Detailed warnings and fault signals allow for fast diagnosis of fault causes. By visualizing sensor data, downtimes can be reduced. Continuous monitoring and predictive maintenance ensure increased switchboard availability. The captured data, such as status information and energy data, are not only available for on-site diagnostics and control. They can also be reliably transmitted to higher-level automation and energy management systems, as well as to cloud-based analysis systems, such as MindSphere.

Sivacon S8 is design-verified in accordance with IEC 61439-2 and stands for safety at a high level. The verification of testing under arcing conditions in accordance with IEC/TR 61641 ensures personnel safety. The active protection system against internal arcing detects and extinguishes an internal arc quickly and reliably. The patented forced-cooling technology reduces derating, and the low temperature profile inside a motor control center (MCC) ensures long-term operation of all electronic devices.

Sivacon S8 offers solutions for all requirements. Flexible modules allow for the simple exchange or addition of functional units. The withdrawable design in particular ensures a high level of flexibility during operation. In addition, the new frequency cubicle panel with the Sinamics frequency converters of the G120 series – tested in accordance with IEC 61439 and with arcing class B – offers a flexible and safe solution for the switchboard. ■

↗ **siemens.com/sivacon-S8**

Sivacon 8PS busbar trunking systems

Innovative alternative to cables

Whether it is for an infrastructure or an industrial application, the Sivacon 8PS busbar trunking systems provide an alternative to cables that is superior both technologically and economically. They are highly flexible both during the planning process and in operation. Their compact design enables a more space-saving installation compared to cables.

During operation, outgoing feeders can be varied by means of flexibly usable tap-off units. In order to generate the data required for efficient energy management, communication-capable measuring and switching devices can be integrated into these tap-off units. In addition, the decentralized installation with switching devices close to the consumers makes operation more transparent, and faults are easier to eliminate.

Innovative software tools support the operator throughout the entire project cycle. With the Simaris sketch software tool, it is easy to create three-dimensional line routing plans for the busbar trunking systems. BIM (Building Information Modeling) data are available for a consistent database. The digital twin of the power distribution system therefore integrates into comprehensive superior building designs for efficient planning, implementation, and maintenance. System extensions or modifications are easy to plan and implement using the Simaris planning tools.

For a simple and high-quality installation and documentation, the BusbarCheck installation app is available. This provides the installer with all the necessary information, such as the installation instructions. Furthermore, every junction can be identified and visually documented. On this basis, an electronic bolt protocol can then be produced at the push of a button and presented to the customer as documentation of the high-quality installation. ■

↗ **siemens.com/busbar**

Installers can download the BusbarCheck app to their mobile device for free – at http://sie.ag/busbar-itunes or http://sie.ag/busbar-android.

HIGHLIGHTS

- High flexibility in the planning process and in operation
- Space saving due to compact design
- Fast, easy, and safe installation
- Energy transparency thanks to communication-capable measuring and switching devices
- High level of system and operational safety
- Support from Building Information Modeling (BIM)
- Simple and high-quality installation and documentation via the BusbarCheck installation app
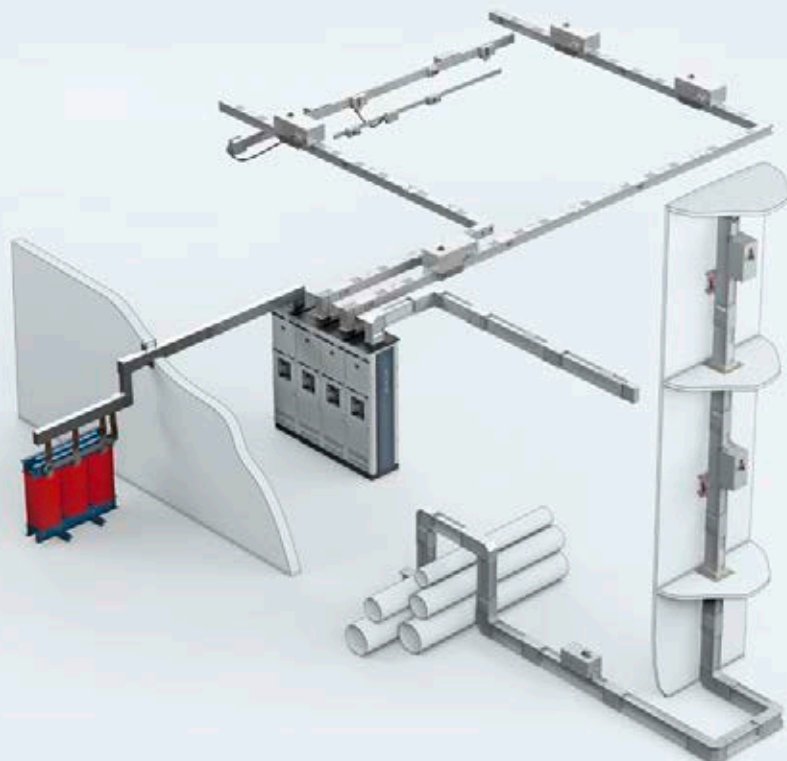
NEW FEATURES

- Fully digital configuration and ordering
- 3D graphical display of all components
- Interactive addition of relevant elements
- Ability to save, load, and export 3D and 2D data for mechanical planning in CAD tools, including device data
- Continuous, dynamic price display

Graphical configurator for Sivacon 8MF system cubicles

Digital planning for rapid deployment

High flexibility and minimum space requirements – these are the key requirements for industrial control cabinet construction that the Sivacon 8MF1 system cubicles are designed to meet. The modular system consists of a basic framework in 90 different sizes and 2,000 flexibly combinable elements to enable custom solutions for virtually all industrial sectors and applications. The new graphical configurator allows control cabinet manufacturers to configure system cubicles directly in the 3D model and then order them electronically. The benefits: considerably reduced planning efforts, flexible, intuitive, and error-free configuration including customized modifications, and significantly shortened order processing.

After choosing a preconfigured enclosure or frame, users can select and add a wide assortment of external and internal parts, side and rear panels, roof versions, trim strips, and accessories via drag-and-drop. The software provides a 3D graphical display of all modules. This makes it easy for users to create realistic visualizations of modifications such as special colors or cutouts. They can then export the generated data in various formats for further processing in widely used CAD tools. Parts lists, prices, and product information are generated automatically, and the ordering process is completely digital. The new graphical configurator for Sivacon 8MF system cubicles is available online and free to download. ■

↗ **siemens.com/sivacon-8mf**

Grid Diagnostic Suite – Powered by MindSphere

Visualizing and analyzing the grid status

Grid Diagnostic Suite – Powered by MindSphere allows grid data to be processed in the cloud. The applications in the Grid Diagnostic Suite enable users to visualize and analyze the data from their Siprotec and Sicam devices. They can then react quickly to changes and plan maintenance measures at an early stage.

The Siprotec Dashboard application for transparent processing of grid data in the cloud makes information from Siprotec devices available in map view on smartphones or tablets, and includes a notification function. This allows grid operators to analyze status messages, protection trips, and safety or security events, and to optimize their maintenance activities accordingly – from anywhere, at any time.

The Sicam PQ Advisor application analyzes the power quality so that operators can track anomalies and trends in the grid. ■

↗ **siemens.com/iot-energy-automation**

NEW FEATURES

- Increase in grid availability and service quality
- Reduction in investment and operating costs
- Predictive maintenance
- Compliance with industry-relevant security standards
- No vendor lock-in due to the use of IoT standards

Industry Services

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

Lifecycle Management Suite

Optimizing maintenance

The Lifecycle Management Suite optimizes plant maintenance and provides support in the planning, execution, and documentation of all service activities. This improves the efficiency and transparency of maintenance processes.

The Comos MRO-based, precon-figured system provides standard operating procedures (SOPs) in the form of checkpoints for lifecycle services, which are assigned to the Simatic PCS 7 system components. The modular portfolio can be adapted as needed to the requirements of a specific plant. ■

↗ **siemens.com/pcs7lcs**

NEW FEATURES

- Preconfigured CMMS system with populated assets and service checkpoints
- Consistent data management thanks to integration in a single data platform
- Mobile data access on-site with maintenance information and documentation in real time

DCS Application Services

Modernizing existing DCS libraries

A comprehensive approach to mod-ernizing DCS systems requires not just upgrading the system software, but also modernizing and standard-izing the individual applications. DCS Library Services is an ideal solution for library exchanges to APL (Advanced Process Library). This solution has more flexible compo-nents and more advanced control algorithms that enable standardized

library exchanges at a fixed price as well as project-specific implementa-tion of AS and OS components. Users can implement library exchanges quickly and reliably thanks to a short test phase. They also benefit from the professional service concept of the DCS Library Services. ■

↗ **siemens.com/das**

NEW FEATURES

- Innovative – modernizing libraries allows users to participate in current and future DCS innovations
- Cost-efficient – using a standardized library reduces maintenance and support costs and avoids unplanned service costs

- Effective – system-oriented, customized processing with a standardized procedure provides for efficient solutions, even to complex problems

MindSphere

Connecting real things to the digital world

Every plant, system or machine generates huge volumes of data. However, most companies can only collect and analyze a small fraction of it. With so much data left unused, major operational benefits are never fully realized. That is where MindSphere comes into play.

MindSphere is the cloud-based, open Internet of Things (IoT) operating system developed by Siemens. With MindSphere, companies can efficiently connect every machine and system in any global factory to a central cloud location. Aggregating these data in one place allows for deep analysis and the discovery of actionable, transformative business insights.

Utilizing Industrial IoT to realize productivity gains

Connecting devices and enterprise systems to MindSphere helps companies benefit from digitalization through various applications. In **asset management**, for example, MindSphere takes an inventory of physical assets and identifies, classifies, profiles, and tracks assets, making service as cost-effective as possible. **Condition monitoring** is another application offering valuable insight by keeping track of key parameters, such as vibration or temperature. By identifying and

reporting faults at an early stage, the **predictive maintenance** performs maintenance based on parts reaching certain thresholds, asset availability, and resource allocation. This reduces scheduled and unscheduled downtimes. MindSphere also supports **resource optimization** by tracking energy consumption and material use, allowing informed decisions based on these insights. In addition, using digital twins in the digital factory facilitates product and process optimization. A **complete, closed-loop digital twin** is possible through MindSphere by feeding real-time, physical performance data back into the virtual product or production model. MindSphere also opens up **new sales channels** with new business models. Leasing machines and charging for product use is one example of this. Offering maintenance services can also generate **new revenue channels**. The remote monitoring of plants, systems, and machines makes off-site predictive maintenance possible.
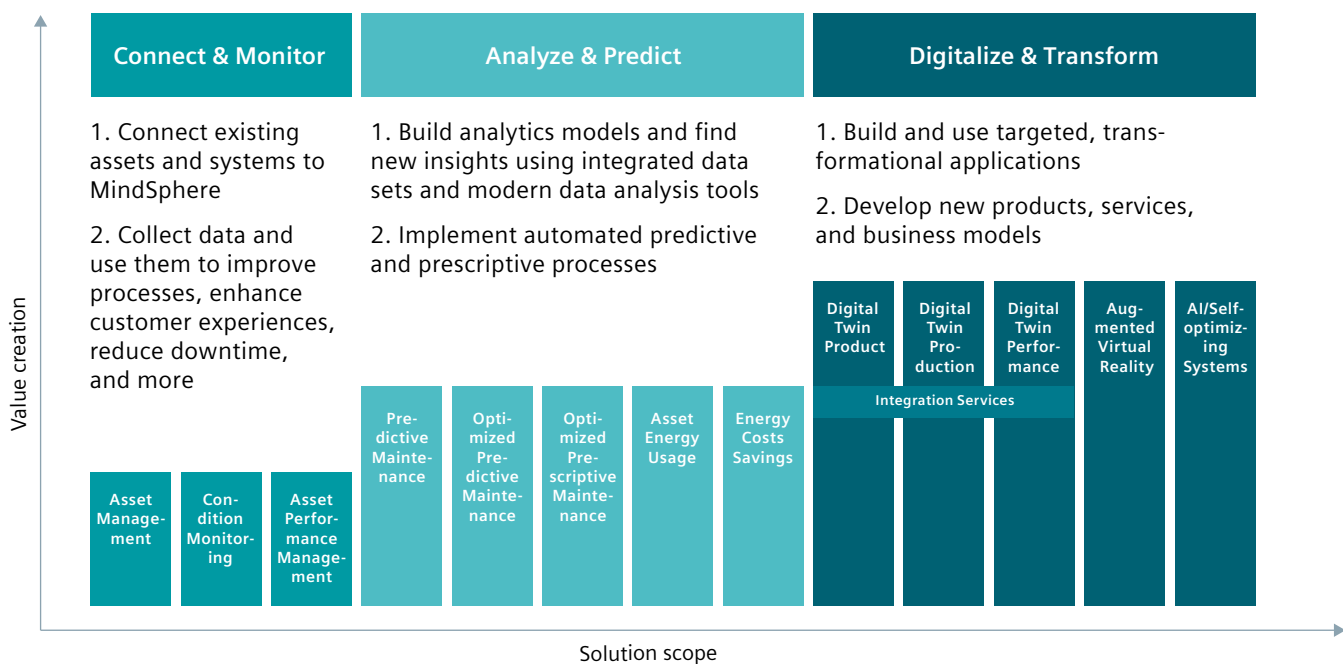
Getting started with Industrial IoT

Siemens has developed a successive, three-phase approach to guide companies through an initial Industrial Internet of Things (IIoT) deployment: Connect & Monitor, Analyze & Predict, and Digitalize & Transform.
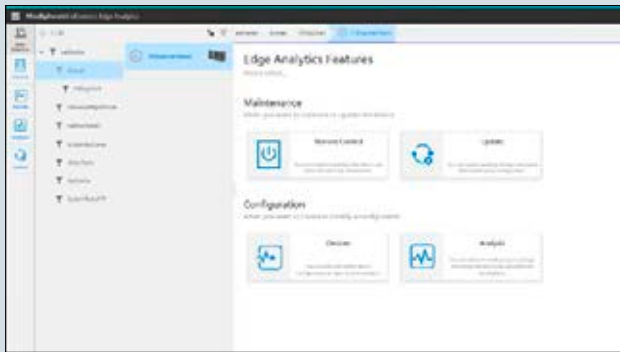
The first step in the journey

The **Connect & Monitor** package solution helps businesses connect critical assets, maintain complete operational transparency, and take action to optimize performance and health, thus maximizing production efficiency and profits. The first stage of this solution involves connecting all of a company's physical assets. MindConnect, the proprietary connectivity solution offered by Siemens, seamlessly connects all of a company's assets – whether Siemens or non-Siemens – to a centralized location. Assets can use any protocol or communication standard.

Once data aggregation begins, the solution components Visual Flow

Connect & Monitor	Analyze & Predict	Digitalize & Transform
1. Connect existing assets and systems to MindSphere	1. Build analytics models and find new insights using integrated data sets and modern data analysis tools	1. Build and use targeted, transformational applications
2. Collect data and use them to improve processes, enhance customer experiences, reduce downtime, and more	2. Implement automated predictive and prescriptive processes	2. Develop new products, services, and business models

Value creation ↑

Connect & Monitor: Asset Management | Condition Monitoring | Asset Performance Management

Analyze & Predict: Predictive Maintenance | Optimized Predictive Maintenance | Optimized Prescriptive Maintenance | Asset Energy Usage | Energy Costs Savings

Digitalize & Transform: Digital Twin Product | Digital Twin Production | Digital Twin Performance | Augmented Virtual Reality | AI/Self-optimizing Systems — Integration Services

Solution scope →

The Siemens approach to IIoT deployment

New functions

MindConnect Edge Analytics enables users to collect, preprocess, and analyze high-frequency data at the source. Using X-Tools technology, it helps to improve latency by only sending data that are needed to the cloud, while enabling early detection of possible damage to machinery, equipment, and plants.

Visual Explorer creates advanced data visualizations that can be shared internally and externally to expedite data-driven decisions. This tool empowers every user in a company, regardless of skill set, to easily access, analyze, and quickly interpret large amounts of data.

Creator and Visual Explorer facilitate asset management, asset performance management, and condition monitoring. **Visual Flow Creator** transforms incoming data in real time. Using intuitive drag-and-drop functions, this solution aggregates and integrates data from connected assets or machines with in-line analytics services to generate actionable information from which new insight can be gained. Workflows can be designed to create rules, define KPIs, and trigger actions, such as email notifications if a threshold value is reached. **Visual Explorer** creates customized, advanced data visualizations and dashboards from complex data sets using Tableau®. This solution enables all users in a company, regardless of their individual skill set, to easily access, analyze, and quickly interpret large quantities of data.

The key to data-driven insight
The next phase of the IIoT process is delivered by the **Analyze & Predict** package solution. It enables manufacturers to use integrated data sets and modern data analytics to gain deep insights that are useful for predicting and preventing unplanned asset downtime. When data are collected over time, machine baselines

and thresholds can be identified. By using these thresholds as guides for maintenance performance, manufacturers can eliminate arbitrarily scheduled downtime. Moreover, aided by real-time alerts, operators can also perform root-cause analysis on operational assets to predict failures across products and plants – reducing unexpected downtime. Key solutions and capabilities in the package that enable predictive analysis include Predictive Learning, Visual Flow Creator, Visual Explorer, and MindConnect Integration. **Predictive Learning** builds models that evolve using machine learning techniques to help predict future asset performance and optimize product quality. This helps reduce performance issues and prevent potential asset failures. **MindConnect Integration** provides full contextual analysis of critical assets by combining legacy databases, enterprise systems, and cloud data sources with data collected on the shop floor.

Taking Industrial IoT to the next level
The third package solution, **Digitalize & Transform**, builds on the first two packages and helps manufacturers build powerful, targeted applications for internal use and to sell to cus-

tomers, enabling the development of new services and business models. This DevOps plan provides open standards, a robust set of application programming interfaces (APIs), a broad and deep range of cloud services, an unlimited number of routes, test assets, and user management scenarios, developer resources, and managed backing services.

With MindSphere, users can create a **closed-loop digital twin** using the developer tools to integrate operational data throughout the value chain. Data collected with Industrial IoT platforms provide detailed insight into real-world manufacturing processes. By taking these data and feeding them back into high-fidelity digital twin models, companies create a digital thread that runs throughout their production and helps speed up development, optimize manufacturing processes, and leverage real-time insight for improving new product versions or iterations. ∎

↗ **siemens.com/mindsphere**

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To meet increasingly individualized customer requests, plant operators need to accelerate their time to market and become more efficient and flexible. At the same time, it is key to maintain or even improve quality. Consistent digitalization along the entire value chain offers great potential for achieving this.

The TIA Newsletter Team looks forward to provide you with tips and support your implementation of the Digital Enterprise.

SPS IPC Drives 2018

Visit us at Europe's leading trade fair for electrical automation and learn how to profit from the digital transformation – today and tomorrow.

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Industrial Edge – the best of both worlds

Benefit from cloud intelligence and scalability directly in your production – easily, with high-performance and without data leaving your production facility.

more>

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The Totally Integrated Automation (TIA) newsletter presents innovative automation systems and refers to specific TIA digitalization use cases to show the benefits that can be achieved with the Digital Enterprise.

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