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# product news

Innovations for the Digital Enterprise

November 2019



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## Blockchain

# The new technology of trust

A blockchain is a decentralized, distributed digital ledger that cannot be manipulated; it can be programmed to record every digital transaction or item of information. These records, also referred to as blocks, contain a time stamp, a link to or cryptographic hash of the previous block and the transaction data.

### Transparency and trust

The blockchain architecture allows all participants in the value chain to view all the details of a transaction from beginning to end. As well as helping to improve their products throughout the entire lifecycle, manufacturers can use blockchain to increase transparency and trust in each individual stage of the industrial value chain. The monitoring and service blockchain therefore has the potential to open up entirely new business models.

### Demand chains instead of supply chains

The benefits of blockchain for production are still just emerging. The real potential of this technology will only be revealed when it becomes easier to assess acceptance – both in terms of the technology itself and regarding the end user. In the long term, it could be possible to use a

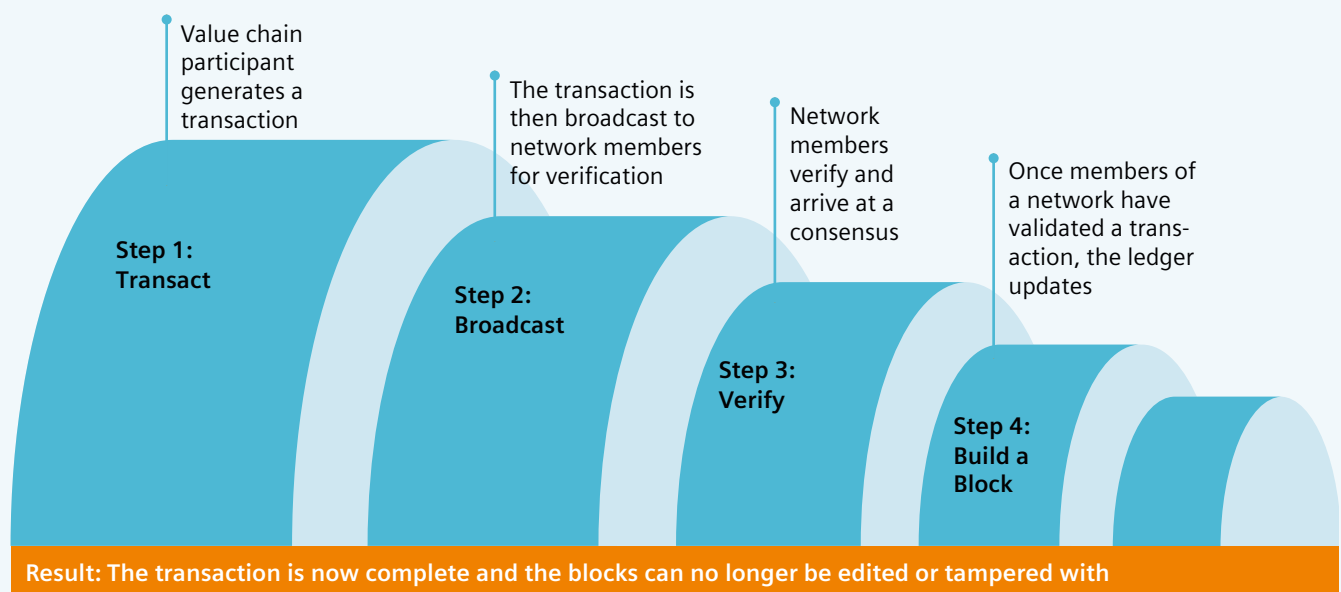
blockchain for process transformation, supply chain tracking, asset sharing, track and trace, warranty management, and more. Ultimately, supply chains could become “demand chains” – in line with the vision of Industry 4.0 in decentralized production.

### Rationalizing processes, simplifying data management

Blockchain thus has the potential to revolutionize supply chains for the manufacturing industry by cutting out the middleman, rationalizing and automating processes, simplifying data management, and increasing security. Manufacturers who are willing to embrace the new technology have the opportunity to shape its development. More than ever, this gives them the chance to guide the process toward genuine transparency, responsibility, and efficiency. For Siemens, blockchain is a key technology for realizing the autonomous factory of the future. At the moment, concepts are being developed that explore how this can be implemented using Siemens automation hardware. ■

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

## How does blockchain work?



## Standardization

# Integrated automation – the foundation for digital transformation

In order to remain competitive, manufacturing companies, but also machine and plant builders, need to become faster and more flexible – while improving quality and using less resources where possible, and ideally being cost-efficient. Conventional automation quickly reaches its limits here. Great potential lies in the complete integration and digitalization of the entire value chain. A fundamental requirement for this is the efficient interaction of all automation components, from the field level through to the company management level.

This is where Totally Integrated Automation (TIA) from Siemens comes in, offering an open system architecture for the entire production process. This enables perfect interoperability across all automation components. Consistent data management, global standards, as well as standardized hardware and software interfaces are the key to making it possible.

The portfolio's unique level of integration and scalability result in real added value across all industries – regardless of the phase of automation or degree of digitalization a company is currently at.

Totally Integrated Automation provides

- **End-to-end engineering** – from mechanical design to electrical layout through to automation
- **Efficient communication** – no language barriers for horizontal and vertical communication, up to the cloud
- **Future technologies such as Industrial Edge integrated in the standard portfolio** – local, high-performance data processing as part of automation, with the benefits of the cloud
- **Integrated security and defense mechanisms** – maximum security for machines and plants despite increased networking and open standards

The TIA portfolio is completed by scalable solution packages (TIA use cases) and special services that make it easy for companies to achieve their digital transformation step-by-step.



## TIA use case “Line Integration”: quickly to the finished solution



Integrating machines into a line is one of the biggest challenges for production in the real world and is usually associated with high costs and risks.

The first step toward making this complexity manageable is to standardize communication – both between the machines within production and to higher-level IT systems. One such communication standard is OPC UA. Communication via OPC UA takes place independently of the respective platform or the automation system used, requiring only that the participants abide by the current specifications of the OPC Foundation. Alongside these specifications, in recent years a number of so-called companion specifications have become established, describing OPC UA communication for specific industries or applications.

Once the interfaces are standardized, the plant operator can validate and optimize the functionality and performance of their line during the planning phase using simu-

lation tools. Meanwhile, the line integrator can begin to develop the line control, and likewise test and validate the solution, without the individual machines needing to be physically available. At the same time, the respective machine builders create a digital twin, which is to say a digital copy of their machine, implement and test the standardized interface, and commission the machine virtually before it is shipped. This allows plant operators, integrators, and machine builders to develop their respective solutions in parallel while at the same time being able to use the information from the project as a whole. The functionality and interaction of the machines can be tested and validated in advance on the model, meaning that it is possible to confirm as early as the planning phase that the individual machines and the conveyor units involved work together as planned.

The consistent TIA portfolio offers the solution for straightforward implementation of standardized interfaces:

- The Simatic S7-1500 OPC UA server & client make it possible to **implement standardized interfaces** based on OPC UA Companion Specifications (such as OMAC or EUROMAP)
- With the Siemens OPC UA Modeling Editor (SiOME), it is possible to **link interfaces to data from the controller** via drag-and-drop
- Simatic S7-1500 enables **implementation** of a **complete line** in accordance with the standardized OMAC state model

Thanks to virtual commissioning and the use of existing industry standards, a faster production launch is possible. ■

Additional solution packages in the form of application examples for specific customer requirements as well as full information about Totally Integrated Automation can be found online at

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

## TIA Portal V16

# Perfectly integrated software development

In machine building, engineering is not just a key part of the process, but also one of the most time-consuming. As machine concepts become increasingly more powerful and more complex, this increases the engineering effort and hence the associated costs. One means of dealing with this is to put in place IT-based methods in automation and to use them in modern engineering tools such as TIA Portal. However, the use of IT-based workflows in automation requires a high degree of standardization.

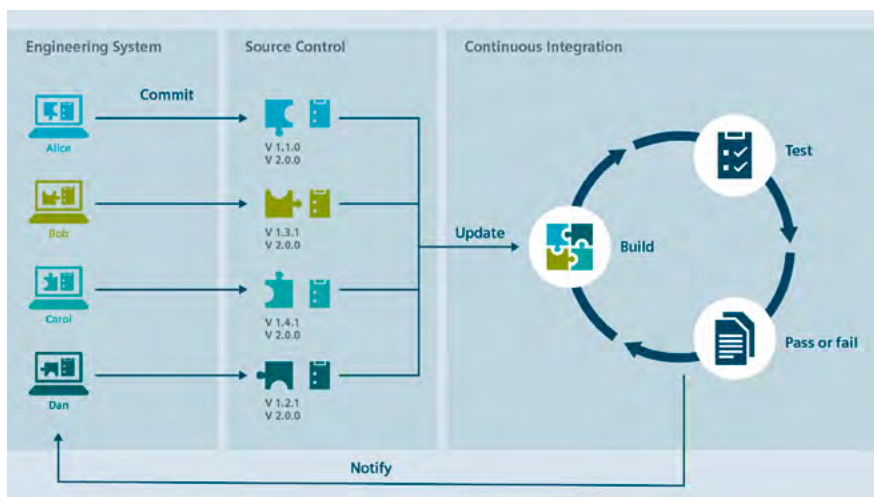
It all starts with an efficient collaboration of all team members involved in machine development. The tool-based software support is designed to help the individual to concentrate on the application. Documenting the application makes it easier to understand, thereby assisting the long-term maintenance and reuse of standardized software modules. Continuous integration helps to detect software integration problems at an early stage, for example through interdisciplinary working and full transparency. This continuous development process essentially comprises three components: efficient development within the team, management of software changes using version management based on the source code, and test-driven, automated inspection of function and software quality.

The new TIA Portal version V16 enhances the functions for engineering and commissioning within the team and makes them available to every user. Meanwhile, manufacturer-independent versioning tools have also become established in software development, and these need to be integrated in the development and documentation

process. The new Version Control Interface (VCI) in TIA Portal makes it simple to incorporate such tools. As the next step, the software developed in the team is tested in a continuous cycle against function and programming specifications. To do this, as many of the steps as possible should be (partially) automated by creating and executing test cases as jobs on the continuous integration server. Alongside improved software quality, this also results in reduced engineering time and hence cost savings. The TIA Portal test suite in TIA Portal V16 provides the user with the best possible support for application testing and for checking compliance with programming guidelines.

The advantages of IT-based workflows and standardization in automation are obvious: the cycle of rapid changes and automated function tests reduces the risk of faults, improves software quality, and makes the development process transparent. Furthermore, automated processes ensure consistency and reduce the time required for engineering. ■

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



### Highlights

- **WinCC Unified System** and **HMI Unified Comfort Panels** (p. 24/25)
- **Simatic Drive Controller** (p. 13)
- **Exclusive multiuser engineering**
- **Version Control Interface (VCI)**
- **TIA Portal test suite**
- Support for **Sinamics S120 single-axis drives** in Startdrive
- **TIA Portal Cloud** as a trial version



## Virtual commissioning

# Save time and costs with virtual commissioning

Machine builders can use the machine's digital twin to simulate and validate all the functions and the interaction between mechanical components, electrical equipment, and automation from an early stage. This virtual testing, simulation, and optimization saves time when it comes to the actual commissioning. As a result, faults can be detected at an early stage and kept out of the real plant. This avoids unplanned machine behavior that can result in delays and significant costs. Plant operators can also use the digital twin to familiarize their personnel with machine operation in advance, and new employees can undergo virtual operator training without endangering ongoing production or causing damage to the actual machine.

Virtual commissioning requires all the real-world components to have an equivalent in the virtual world. Simit

simulation software allows the user to simulate the sensors and actuators in a machine or plant, for example drive sensors and actuators. The control system transfers commands to the drive, such as speed or rotational direction, and the drive system provides feedback accordingly. If this were not part of the simulation, the PLC program would have to be specially adapted for the simulation in order to test its function. Simit allows for a simulation using the original PLC program.


The new Simit version V10.1 provides a solution with FMI and FMU. FMI (functional mock-up interface) defines a standardized interface that makes it possible to connect to different simulation software. Furthermore, it serves as the replacement and co-simulation for dynamic models. Each FMU (functional mock-up unit) model is provided as a .zip file that contains all

## Highlights

- **Possibility of reusing** existing simulation models
- **Effortless exchange and connection** of simulation models
- **Know-how protection:** integration of the models as a black box
- **Creation of the simulation model** using the most suitable solution (across all tools)
- **Consistency** – increasing the number of tools with FMI support

information used by the FMU model, such as the definition of the variables as well as all the formulas and other data required by the model, such as parameter tables, user interface, and documentation. Thanks to the openness of this technology, it is possible to use any manufacturer-independent simulation tool (for example Simcenter Amesim, MATLAB, OpenModelica). ■

› [siemens.com/virtual-commissioning](https://www.siemens.com/virtual-commissioning)



Siemens Industrial Edge

# Intelligence in production

Modern production plants are data factories: a plant with several hundred networked systems generates up to a petabyte of data every day. This is incredibly valuable for analysis and optimization purposes in digital enterprises. But – how can these enormous volumes of data be processed efficiently?

Siemens Industrial Edge brings data processing down from the cloud and closer to the data source, thereby solving some of the challenges of cloud solutions in the discrete and process industries: latency and costs of data transfer, and the handling of sensitive data. However, Industrial Edge is more than just an option for processing data before they are stored in the cloud. With IT using methods such as machine learning and moving closer to the data source, there are new opportunities for using data in production. Furthermore, Industrial Edge facilitates the integration of all end devices into a common management infrastructure, for more efficient, more secure, and more cost-effective management of distributed systems in the intelligent factory.

A key feature of Siemens Industrial Edge is decentralized data processing and analysis at the production level using Edge devices or integrated into the automation portfolio using specific Edge apps. Short paths and minimal latency, even for large data volumes, allow for high-performance data processing, based on high-level languages, in real time. However, the data can also be stored and preprocessed in the automation system so that only compressed and relevant

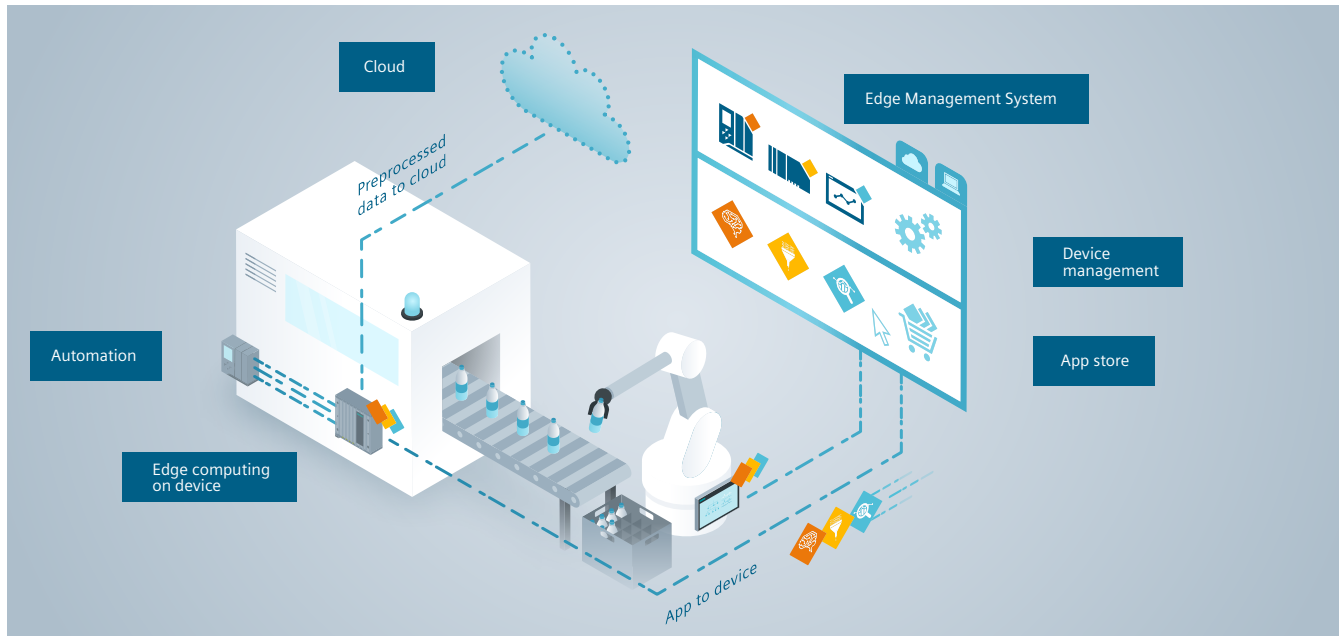
## Highlights

- Efficient integration of IT and data processing functions in automation
- Maximum flexibility in terms of Edge applications and Edge-capable automation devices
- Edge applications for data processing, analysis, and exchange
- High security thanks to secured Edge runtime on the devices and frequent updates
- User-friendly management, operation, and scaling of hundreds of Edge devices worldwide using apps



data are sent to the cloud or IT systems. Users can distribute the app and system software between their devices as a decentralized concept and perform security updates on the machines at regular intervals. This not only meets

the requirements for openness and flexibility, but also for high IT security, and allows Edge computing solutions to be scaled to hundreds of Edge devices distributed around the world. ■



## The open Edge system from Siemens

The combination of hardware and software in the Siemens Industrial Edge portfolio improves the flexibility, openness, and security of industrial automation. This transforms the way in which data is handled and processed within production.

### Edge Management System

This system is used worldwide to manage hundreds of Edge devices centrally – either from the cloud or on site within the factory. Edge apps and Edge functions, such as security updates, can be downloaded centrally. This allows for a high degree of flexibility.

### Edge App Store

Using the central app store, app developers, system integrators, machine builders, and users can exchange apps with one another and benefit from this global connection. With a free choice of available Edge apps from Siemens and its partners, it is very easy for users to get started.

### Integrated connectivity

Data processing and analysis capabilities can be integrated into automation on the basis of typical IT functions and high-level languages such as C, C++, Java, Python, or node.js. Preprocessed data, such as analysis results, are forwarded directly from the Edge device to higher-level systems such as the cloud or to an IT infrastructure with integrated connectivity. Connectivity to the following is integrated as standard:

- Simatic S7
- Sinumerik
- OPC UA client
- OPC UA server
- MQTT
- AMQP
- Option for third-party connectivity.

## For plants with Simatic, Sinumerik, or third-party controllers

Siemens Industrial Edge is available in two configurations: one for machines and plants using Simatic Edge, and one for machine tools using Sinumerik Edge. In both cases, Siemens provides an open system for maximum flexibility and any type of application, as well as market-specific add-ons such as domain-specific Edge devices, Edge apps, and connection to Simatic, Sinumerik, or third-party systems.

### Simatic Edge apps

A large number of predeveloped Edge apps are available for the Simatic environment, making it easy to get started. These cover the most common applications in discrete manufacturing and the process industry, and can be implemented with minimal effort.

#### Simatic Flow Creator

An easy way to get started with local data processing: the graphic user interface supports the creation of a custom solution for data processing and connectivity, using a set of predefined functions.

#### Simatic Performance Insight

This flexible performance monitoring tool monitors the key indicators for machines, production lines, and the plant as a whole. A personalized dashboard can be created in just a few minutes to reveal optimization potential.

#### Simatic Notifier

Downtimes can be reduced thanks to additional information. The Simatic Notifier Edge app therefore sends relevant notifications to the mobile devices of operating and maintenance personnel. If the material for a machine has run out, the service technician is automatically notified on their smartphone with a push notification – no matter where they are at the time.

#### Simatic LiveTwin

Simulation models can be integrated into Edge devices in order to implement virtual sensors and a model predictive control. For example, the heating up of the drive system can be predicted by means of a continuous analysis of the electric current. The integrated model then calculates when the drive would overheat.

#### Simatic Assistant for machines

A speech recognition system using a headset or chat makes it possible to interact with the machine to identify the sources of faults as quickly as possible. For example:  
"Machine, tell me the maximum drive temperature in the last 24 hours."  
"Certainly: 60°C."  
"Show me the data in detail." ...

#### Simatic Machine Insight

This condition monitoring app enables better maintenance and diagnostics of the machines. It monitors and provides information via notifications concerning machine events, diagnostic data, and machine status, thereby helping to identify the sources of faults and improve service efficiency.

## Sinumerik Edge apps

Sinumerik Edge is a machine-oriented Edge platform designed specifically for the machine tool industry. A range of applications enable feedback-free data processing from the machine tool sensors. Alongside Siemens' own applications, third parties and machine tool operators can also develop their own apps, thanks to a specially adapted development environment. The resulting new applications make it possible to minimize costs, for instance those arising as a result of downtimes, outages, or defects. At the same time, the productivity of the machine tools is increased, without changing anything on the proven machine itself.

### Analyze MyWorkpiece /Vision

With the aid of a camera image, the AI-based software detects whether the right workpiece is in the correct position in the machining space. It is also possible to integrate detection of tool wear into the process, for improved machining and process quality.

### Analyze MyWorkpiece /Capture

With this Edge app, users can record all real-time workpiece-machining data for subsequent visualization and analysis in Analyze MyWorkpiece /Toolpath in order to optimize quality. With the Capture4Analysis version, the data can be used for any data analytics tasks.

### Analyze MyWorkpiece /Trochoidal

This Sinumerik Edge app can be used to program the most advanced form of trochoidal milling directly on the machine. By taking account of dynamic data from the machine and variable tool path velocities, it is possible to increase tool life and shorten machining time.

### Analyze MyMachine /Condition

The app provides a comprehensive, data-based map of the machine status. Early detection of deviations makes it possible to avoid machine failures, resulting in increased machine availability. The data interpretation facilitates more intelligent maintenance interventions and optimization of machine parameters.

## Edge devices

With Industrial Edge, new opportunities to analyze and process data emerge, for example using artificial intelligence. Simatic Edge devices, such as IPCs, fulfill these challenging tasks. Edge-capable automation devices such as controllers, HMIs, and network routers also support the integrated Edge functionality.

### Simatic IPC

Industrial PC in a scalable performance class for data acquisition and analysis directly in the manufacturing environment – with integrated connectivity to IT and the cloud.

### Simatic S7-1500 TM MFP

Technology module for central connection to any Simatic S7-1500 CPU, with Simatic Industrial OS and Edge runtime for Siemens Industrial Edge applications at the control level.

### Unified Comfort Panel

First HMI panel with integrated Edge functionality (see p. 25 for further information).

### Ruggedcom APE1808 module

For the RX1500 switch and router family (see p. 47).

## Simatic MindSphere Energy Manager App

# Transparent energy flows

The Simatic MindSphere App Energy Manager helps companies to monitor and analyze the energy consumption of machines and plants distributed around the world. This cloud-based application enables the user to call up, analyze, and compare energy data via MindSphere, for example to determine global benchmarks and identify opportunities for optimization.

The application presents the relevant key energy consumption indicators in configurable dashboards, thereby supporting the planning and implementation of efficiency measures. The result: as well as achieving energy transparency in line with ISO 50001, companies also benefit from comprehensive analysis of energy consumption in terms of costs and loads. ■

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

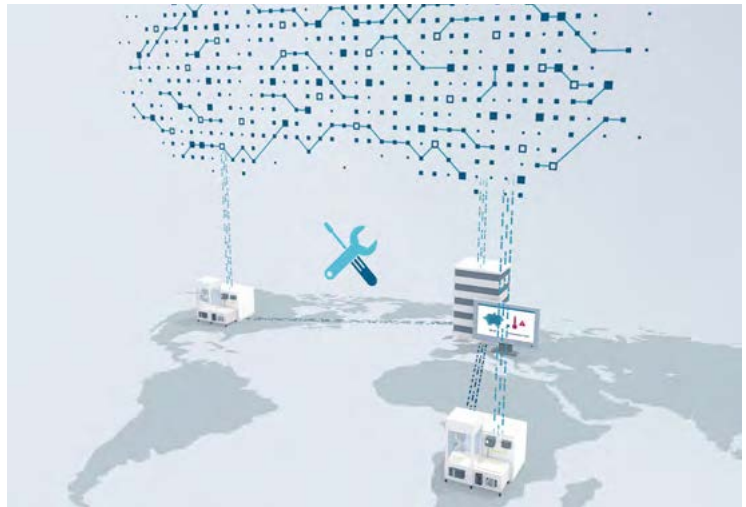


### Highlights

- **Transparency on energy costs** from the machine level to global sites
- **Easy configuration** of KPIs
- **Quick overview of KPIs** as required
- **Analysis by media** available immediately

## Service package with Simatic MindSphere Apps

# The direct route to better machine service – worldwide



### Highlights

- **Global monitoring** of machines and notifications to improve service
- **Three months free testing** of Simatic MindSphere Apps and MindSphere access
- Order by August 2020 and get an additional **30% off for three years** after the test phase
- **Now with reduced-price MindConnect Nano** for first order

Machine builders benefit from the all-inclusive Simatic IIoT machine service package that offers a quick and easy introduction to the Industrial Internet of Things. The package comprises the MindConnect Nano hardware for data acquisition and transfer to MindSphere, a MindAccess IoT Value Plan S license, the Simatic Machine Monitor and Simatic Notifier MindSphere Apps, and MindService training.

The service package enables machine builders to track the maintenance needs of machines installed anywhere in the world and to take a proactive approach for improved planning of pending maintenance tasks. Both users and OEMs benefit from reduced travel expenses, more efficient resource planning, and shorter response times. ■

› [siemens.com/iiot-machine-service-package](https://www.siemens.com/iiot-machine-service-package)

## Technology CPUs / portfolio expansion

# Scalable Motion Control solutions

Customized products require machines and production lines that can be adapted quickly and easily to different formats, sizes, types of product, and production processes. Alongside flexibility, efficiency, precision, and availability, reliability – in the context of reliable monitoring of all movements – plays a key role in production machines. To this end, Siemens provides appropriate technological solutions based on the Advanced and Distributed Controllers, and now also based on the Drive Controller.

The new Simatic Drive Controller sets the benchmark for integration of the Simatic S7-1500 control system and the Sinamics S120 multi-axis drive system. Without needing additional

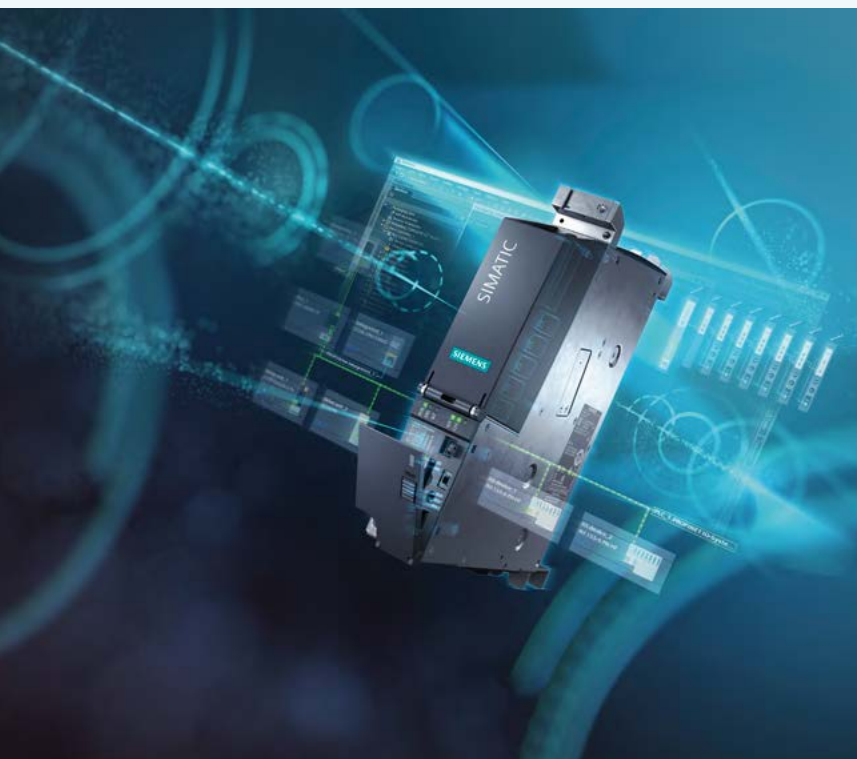
space in the control cabinet for the controller, it integrates Motion Control, technology, PLC, and safety functions directly into the modular, highly dynamic Sinamics S120 multi-axis drive system. The entire, comprehensive range of integrated interfaces and technology I/Os are available in two performance classes and enable efficient implementation of compact, modular automation and drive solutions. Engineering the Simatic Drive Controller is carried out conveniently in TIA Portal using Simatic Step 7 and Sinamics Startdrive.

It is now also possible to control the modular, individually configurable Multi-Carrier-System (MCS) transport solution using the Simatic Advanced and Distributed Controllers with

integrated Technology CPU functionality. Furthermore, the expansion of the Technology CPU portfolio to include preconfigured Distributed Controllers enables quick commissioning of PC-based Motion Control applications by keeping configuration and installation effort to a minimum.

Synchronous operation across PLCs is now available as a function in all Technology CPUs. This allows for gearing or camming between axes located on different CPUs, making it easier to achieve modular automation concepts and to distribute performance across multiple CPUs. ■

[siemens.com/drive-controller](https://www.siemens.com/drive-controller)  
[siemens.com/t-cpu](https://www.siemens.com/t-cpu)  
[siemens.com/simatic-technology](https://www.siemens.com/simatic-technology)



## Highlights

- CPU 1507D TF and CPU 1504D TF **Drive Controllers** as **drive-based design**
- **Synchronous operation across PLCs** to realize modular automation concepts
- CPU 1515SP PC2 T and CPU 1515SP PCT TF **Distributed Controllers** in a bundle with WinCC Runtime Advanced
- Linear MCS from the Siemens/Festo cooperation: **turnkey complete system solution for production processes** meets the most demanding requirements for flexibility and dynamic response



## Sinumerik One

# The “digital native” CNC

The latest CNC generation, Sinumerik One, has laid the foundation for the digital transformation in the machine tool industry. The digital twin is an integral part of this control system. For the first time, it offers machine builders and machine tool users a consistent digital-first strategy: central processes in manufacturing are always simulated on the digital twin first. This eliminates non-productive time.

The future-proof hardware and software platforms of Sinumerik One improve both machine performance and machining performance. In the field of mold-making, for example, productivity gains in the double-digit percentage range are possible. Computing-intensive tasks such as collision monitoring can now take place during the machining process without restrictions, while innovative technology functions help improve machining speed, contour accuracy, and machining quality.

TIA Portal forms the basis for engineering Sinumerik One. Modern programming languages and a seamless flow of data make it possible to configure not only PLC and safety, but also HMI.

In addition to Sinumerik One, Siemens also offers the associated digital services. With the digital twin, unproductive activities such as running in new NC programs can be moved to the virtual world. NX Virtual Machine Tool Services

## Highlights

- **High quality and accuracy** of all processes by using the **digital twin** as the basis for real actions
- Access to **the latest innovations** in automation technology
- Engineering in **TIA Portal** reduces development time and hence time to market
- **Digital service offering** supports machine builders and operators with the creation and commissioning of the digital twin

support machine builders and machine tool operators in the creation of the digital twin. From engineering and implementation through to training and support, Siemens covers the entire lifecycle of the machine tool's digital twin. Sinumerik One Virtual Commissioning Services offer machine tool builders support when moving commissioning tasks to the virtual world. Thanks to the triad of consulting, training, and implementation, machine builders benefit from faster, risk-free commissioning and efficient optimization of the engineering task. ■

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

## Digital Motion Control Services

# Increasing the productivity of machine tools



### Highlights

- **Digital Transformation Consulting CNC:** developing a custom digitalization roadmap
- **Brownfield Connectivity Services:** networking different production plants

With digital services from Siemens, production can be optimized on the basis of a customized digitalization strategy. Digital Transformation Consulting CNC helps to identify optimization potential together with the customer and develop a digitalization strategy with specific actions recommended to optimize production. Brownfield Connectivity Services make it possible to connect third-party controllers and older systems

to higher-level networks. The system architecture is defined and installed in line with customer requirements. By using the services, customers benefit from the complete networking of all existing manufacturing machines and the parallel forwarding of data to different target systems. ■

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

## Sinumerik MC

# New CNC system for special technologies

Thanks to its integrated Sinumerik CNC, Simatic controller, and Windows 10 operating system, Sinumerik MC is the ideal solution for machine tools with customized user interfaces. The short response times of Simatic S7-1500F PLC enable the control to achieve a higher machining speed, significantly enhancing the automation performance. Applications range from wood, stone, and glass processing through applying adhesive to basic grinding applications and special machine tool technologies. These include sheet metal cutting, laser and water-jet cutting, and additive manufacturing.

The integrated Windows operating system makes it easy to create a customized user interface. At the same time, innovative CNC and PLC technology ensures excellent motion control and high automation performance. Additionally, engineering in TIA Portal is straightforward and efficient thanks to symbolic programming, modern programming languages, and comprehensive toolboxes. This results in lower commissioning times and costs. ■

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



### Highlights

- Easy to create a customized **user interface**
- Highly accurate **motion control** using Sinumerik CNC technology
- **Freedom and flexibility** in machine control thanks to G-code programming
- Straightforward **engineering in TIA Portal**

## Simatic S7-1500 CPU, FW 2.8

# Capabilities across multiple devices

With the 2.8 firmware version for Simatic S7-1500 CPUs, Simatic S7-1500 controllers can now be accessed externally via different IP networks. Sensitive email data are protected via secure emails with file attachments and encrypted before sending. An innovated web server ensures straightforward and secure integration of the data. This allows users standardized access, for example, to variables for their own evaluations.

Furthermore, the new Simatic S7-1500 CPUs provide a range of diagnostic functions: project tracing across devices allows for improved plant diagnostics, regardless of the CPU involved. The diagnostic functions for the OPC UA server have also been expanded. Communications errors can be located and fixed faster with an online diagnostics view, diagnostic buffer entries, and the OPC UA connection indicator. ■

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



### Highlights

- **IP routing across multiple devices** with IP forwarding and IP accessibility for access, for example via web server, from any physical location
- State-of-the-art **JSON-based data integration**
- **Restart of OPC UA server** with TIA Portal download only after changing OPC UA-relevant data

## Simatic S7-1200, FW 4.4

# Improved connectivity

Simatic S7-1200 has an extensive range of communication options. This makes it possible to use a wide range of field devices, exchange data with other controllers, and forward these to any chosen management systems. The new 4.4 firmware version expands the communication functions, in par-

ticular for improved data transfer between devices. This makes the controller ideal for use in industry, agriculture, and infrastructure projects. OPC UA Data Access as server provides for standardized horizontal and vertical communication, as well as compliance according to any industry-

specific requirements such as OMAC PackML, Weihenstephan, and so on. The optional push-in terminal blocks ensure straightforward, tool-free installation. ■

› [siemens.com/s7-1200](https://www.siemens.com/s7-1200)



### Highlights

- Standardized communication based on **OPC UA**
- Straightforward adaptation to industry-specific companion specification with **Siemens OPC UA Modeling Editor (SiOME)**
- DNS name resolution for symbolic addressing with **open user communication (OUC)**, including encryption
- **Send emails securely**, optionally with attachment



## Braumat/Sistar V8

# Create recipes fast

Mixing processes play an increasingly important role in the manufacturing industry, whether this takes place in a brewery, dairy, or battery production, and involves mixing solids, liquids, or viscous substances. The new Braumat/Sistar version V8 is now also available with the benefits of the TIA Portal engineering framework. Using the symbol library – supplied free of charge – enables quick creation of recipes for mixing processes and the required visualization. All the steps can be easily synchronized while the mixing processes are running, and diagnostics can even be performed during operation in the event of a fault. Security issues are also becoming ever more important. This

is why, for the first time, Braumat/Sistar V8 supports a password-protected PLC and login using an RFID reader capable of using a company ID card as login credentials.

For small plants, it is now possible – using the Open Controller from TIA Portal and a simple panel – to implement Lean, a very effective small system on the basis of Braumat/Sistar V8 at entry-level prices. This entry-level solution is designed so that, on expansion to a large Braumat/Sistar system, existing investments can be reused thanks to the seamless scalability. ■

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

### Highlights

- Based on **S7-1500**, **S7-1500F**, or **PC-based solutions** in TIA Portal
- Integration of **dosing and weighing automation** with Siwarex FTA
- **PM Quality** as an integrated extension for Braumat/Sistar enables flexible batch, shift protocols, graphic calculations of complex KPIs and long-time archiving





## Highlights

- Transparency on **compliance with security requirements**, for example under IEC 62443
- State-of-the-art **implementation and configuration of security features**
- **Compliance with required security levels** over the entire component lifecycle

## Security service packages for Simatic

# Protecting productivity

Digitalization offers many opportunities for industry, but also poses risks. One of the biggest is the threat of cyber attacks, as these endanger the entire concept. For this reason, industrial security is of major importance. Since digitalization entails networking right down to the sensor level, it is especially relevant for operators to protect their automation systems against this threat. Simatic automation devices offer the option of increasing the security level of a plant by means of appropriate configuration.

However, to do this, the user needs to know exactly which settings to make. To support customers in protecting their plants, Siemens has developed security service packages specifically for Simatic automation systems. The packages

comprise a range of services from industrial security experts who make sure that the automation devices have the appropriate security settings and that the entire plant is therefore optimally equipped for digitalization. This includes, for example, hardening a Simatic S7-1500 and checking it on a regular cycle to detect modified settings. The packages also include solutions for efficient vulnerability management. The packages are not designed solely for end customers, but also for machine builders who, for example, require security advice for their machine and corresponding certification of its secure configuration. ■

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

## Simatic ET 200eco PN

# New portfolio with high degree of protection

### Highlights

- **High supply current** up to 12 A (L-coded connectors)
- **Single/double assignment** of channels can be set via **parameterization**
- **Isochronous operation** through to the channel
- Improved availability owing to **S2 redundancy**
- **Shared device** (distributing module channels to multiple controllers)
- **8-port IO-Link Master**

The proven Simatic ET 200eco PN has been completely innovated. In place of the previous eleven modules, the portfolio of digital modules now comprises just six modules – five digital modules and an IO-Link Master – but without losing any functionality as a result. The functional expansion of the new modules and corresponding portfolio streamlining, as well as the harmonization of module widths, have made it easier to standardize machine designs and cut storage costs.

All this also reduces planning effort. Thanks to the high current carrying capacity, it is easy to bridge even additional cable runs. Installation and handling of the modules also require



little effort, as they can be installed directly on the machine, outside of the control cabinet, and are especially resistant to environmental influences thanks to the metal housing. MSI/MSO, read access for inputs and outputs of two controllers, and detailed diagnostics ensure an enhanced level of machine/plant transparency. ■

➤ [siemens.com/et200ecoPN](https://www.siemens.com/et200ecoPN)



### Highlights

- **Excellent price-performance ratio** for price-sensitive applications
- **Minimum footprint** thanks to highest possible channel density
- **Hot swapping:** the new active backplane bus makes it possible to replace modules during ongoing operation
- **Time-saving installation** thanks to tool-free shielding and use of the TOP connect portfolio

## Simatic ET 200MP/Simatic S7-1500 IO

# Simple and direct migration

The new high-density channel modules for Simatic S7-1500/ET 200MP make it possible to minimize the footprint of S7-1500 stations. A total of four new digital modules with 64 channels each and two analog modules with 16 channels each allows for space-saving and cost-efficient installation of large numbers of channels in the control cabinet. Combined with the new active backplane bus for Simatic ET 200MP, they enable hot swapping of modules. This means that, in the event of failure, modules can be replaced while the CPU is running and the unaffected modules remain in operation. The new portfolio makes Simatic ET 200MP ideally suited for use with S7-1500R/H fault-tolerant systems in the process environment, where high channel densities and high availability are required. Thanks to the new portfolio, proven existing systems based on S7-300/ET 200M can be easily migrated to the new S7-1500 systems. ■

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

## Simatic ET 200 MultiFieldbus interfaces

Plan with confidence in a global environment



### Highlights

- **MultiFieldbus IMs** for ET 200MP (IM156-5MF ST), ET 200SP (IM156-6MF HF), ET 200eco PN (in preparation), PN/MF couplers
- **Simultaneous communication** to the modules of a station via the same line using all protocols
- **Engineering via MFCT** (MultiFieldbus Configuration Tool)
- **MultiFieldbus coupler** for low-effort integration of Simatic controllers in existing machines/plants

Thanks to MultiFieldbus IMs for Simatic ET 200, Simatic ET 200 stations and modules can now be connected to controllers using Modbus TCP or EtherNet/IP as well as Profinet. Users save costs and planning effort due to the fact that the same I/O configuration can be used irrespective of the higher-level controller when designing machines or plants. The same IM can be used for all bus systems, meaning it is not necessary to amend electrical circuit diagrams, for example. The MultiFieldbus IMs offer excellent flexibility, as the same Simatic ET 200 station/module can be accessed from multiple controllers using the shared device function. The same I/O station can communicate with different controllers simultaneously over the same cable, even where different bus protocols are used. ■

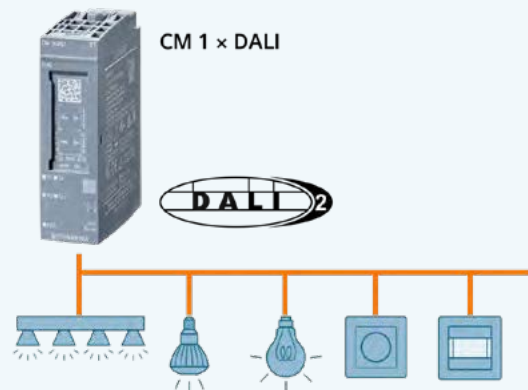
› [siemens.com/et200](https://www.siemens.com/et200)

## Simatic ET 200SP DALI

# Simple lighting control

With immediate effect, the ET 200SP electronic module CM 1 × DALI offers the option to control lighting applications directly from the Simatic user program via the DALI lighting control system (Digital Addressable Lighting Interface). This means that lighting controls can be integrated into automation easily and cost-effectively. One DALI line with up to 64 lights and 63 sensors can be connected per CM 1 × DALI multi-master module. CM 1 × DALI is thus suitable, for example, for controlling the lighting in tunnel applications, on the shopfloor, in logistics plants, and on ships. The integrated DALI bus power supply can provide DALI upstream devices and sensors with a current of 160 mA. Function blocks in TIA Portal offer a simple option for controlling the connected devices. ■

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



### Highlights

- **Save space** for additional control devices thanks to the **small footprint** of Simatic ET 200SP
- **Save time when engineering** thanks to simple parameterization and programming **in TIA Portal**
- **Freely scalable** quantity structure thanks to the option of plugging several modules into each station

## Simatic ET 200SP CM CAN

# Integration of CAN devices

The new CM 1 x CAN communication module for Simatic ET 200SP allows CAN/CANopen devices to be connected directly to an ET 200SP station. Thanks to the small footprint of Simatic ET 200SP, the communication module is suitable for CAN connection of automation solutions in restricted spaces – especially in the food and beverage and automotive industries. Here, the CAN connection is used for automated guided vehicle (AGV) systems or e-car charging, for example, where it is required for CAN-based charging via CHAdeMO. ■



### Highlights

- Implementation in accordance with **CiA 301 specification**
- Compact, affordable solution for **connecting CAN/CANopen devices**
- **Save time** when engineering thanks to straightforward **parameterization in TIA Portal**

**CANopen**

> [siemens.com/et200sp](http://siemens.com/et200sp)

## Simatic ET 200SP Siwarex

# Weighing processes with minimum footprint

In rotary filling plants, space is very tight. The new Siwarex TM WP351 weighing module for Simatic ET 200SP enables fast, precise dosing and filling tasks in the limited space available in these plants. The high

resolution of this simple, affordable solution for automated, calibrated weighing applications also allows for rapid product changeover. ■

> [siemens.com/siwarex](http://siemens.com/siwarex)



### Highlights

- Suitable for **applications requiring official calibration** in accordance with OIML R51, R61, R76, and R107
- Simple commissioning and service via **web server interface**
- **Cycle times** < 1 ms

## Simatic Micro-Drive F-TM ServoDrive

# Drive for Simatic ET 200SP

In combination with EC motors, F-TM ServoDrive – the new member of the Simatic Micro-Drive family – enables dynamic and exact positioning up to 250 W with a very compact installation. Engineering in TIA Portal significantly reduces the engineering time and considerably simplifies drive design, commissioning, and service. The new Simatic Micro-Drive system comprises the F-TM ServoDrive drive actuator as the ET 200SP technology module, the associated BaseUnit (U0), flexible-use motors with gearbox, and connecting cables. ■

> [siemens.com/micro-drive](http://siemens.com/micro-drive)

### Highlights

- **Safety extra-low voltage drive controller** 24–48 V DC, up to 250 W
- **High power density:** 20 mm wide
- **Safety Integrated:** STO hardwired (SIL2)



## Siplus HCS

# High-power, compact heating solutions

Since nearly every finished product is subjected to at least one thermal treatment during manufacture, heating control systems (HCS) can be installed almost anywhere. The enhanced Siplus HCS4300 I/O system now makes it possible to control electrical heating elements up to 60 A. Thanks to the higher power output, they can be used in the metal, light-weight construction, food and beverage, and paper industries, among others. Moreover, it is now possible to control 3-phase heating elements in a closed delta configuration. These are typically used for higher heating outputs.

For small heating applications of up to 32 heating elements, the HCS4200 I/O system together with the compact CIM4210C central interface module (CIM) offers a particularly space-saving solution. This is the first time that an HCS has been suitable for

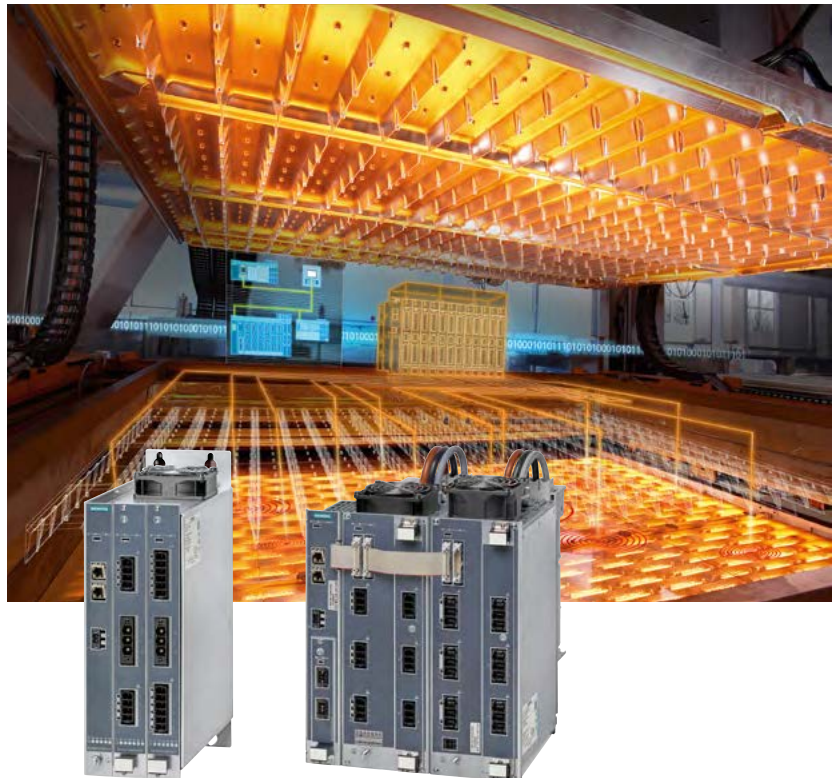
installation in flat control cabinets. All the power output modules of HCS4200 can be used in the two slots on the CIM.

Quick to commission and requiring minimal wiring effort, Siplus HCS is easy to integrate into automation using the TIA Portal engineering framework. An HCS program library and application examples simplify the engineering process even further. Intelligent control routines ensure uniform load distribution and loading of the network. Integrated diagnostics functions enable fast detection and pinpointing of faults. ■

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

## Highlights

- **POM4320 Highend power output module** for controlling heating elements up to 60 A in 230/277-V and 400/480-V networks
- **CIM4210C** measuring just 104 mm wide with a footprint of 0.035 m<sup>2</sup>
- **Integrated current measurement** at each output for diagnostics on heating elements connected in parallel



## Simatic Energy Suite V16

# Avoid power peaks – without productivity loss



The new load management function in the Simatic Energy Suite is designed to avoid load peaks in industrial applications and to distribute loads evenly. Load management helps to monitor the power limit for electrical energy and to avoid penalty payments – automatically and with no effect on production processes.

Simatic Energy Suite is PLC-based, meaning that it integrates load management directly at the production level. Load management continuously calculates the forecast final consump-

tion value for the particular period and connects or disconnects actuators in accordance with the configured priority and depending on the available potential.

The user benefits from efficient engineering in TIA Portal: load management is configured via input masks in TIA Portal, then the program is generated, and the corresponding visualization is configured. ■

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

### Highlights

- **Ready-to-use solution** for load management
- **Uniform load distribution** thanks to discrete connection/disconnection of consumers, generators, and storage devices
- **Engineering and visualization** from a single source
- Significant **reduction in configuration effort**

## Simatic Energy Manager V7.2

# Certified system for detailed energy analysis

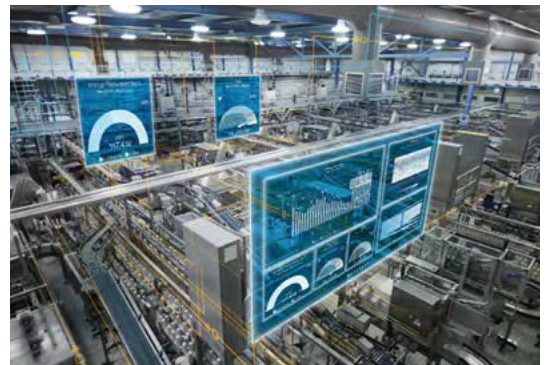
The current version 7.2 of Simatic Energy Manager for ISO 50001-compliant energy management in industry enables the detailed, transparent display of power flows and consumption values based on data captured in real time, exact to the second. To do this, version 7.2 offers new functions for connecting data sources. The system can now also communicate with the building automation

systems via a Desigo CC interface and can make data available as an OPC UA server. Furthermore, the new version supports the user with additional functions in the web client that reduce the time required for system configuration and diagnostics. ■

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

### Highlights

- Reduced configuration effort thanks to enhanced **online configuration options**
- **Rapid fault analysis** via the web
- **Simple integration of data** from a range of sources for further analysis



## Simatic WinCC Unified System

# Web-based visualization for industrial applications

A future-proof, completely newly developed complete system for operator control and monitoring of industrial plants relies on the latest web technology. The Simatic WinCC Unified System comprises the Simatic WinCC Unified visualization software and the new generation of HMI panels: Simatic HMI Unified Comfort Panels.

The runtime of the newly developed Simatic WinCC Unified visualization software in TIA Portal is based on native web technologies such as HTML5, SVG, and JavaScript. The high scalability of the platform enables end-to-end solutions across all kinds of applications, from operator panels at the machine level to complex, distributed SCADA systems. When designing the system, great emphasis was placed on overall openness. To this end, interfaces were implemented that enable automated configuration (TIA Portal Openness) on the one hand and make it much easier to transfer data during operation on the other. This, in turn, considerably simplifies collaboration between devices.

The user has the option of integrating other, user- and industry-specific applications into the WinCC Unified user interface.

Configuration is consistently integrated in TIA Portal. Once created, components can be reused across all platforms, including panel, PC, or, in the future, apps in the cloud or Edge environment. The WinCC Unified runtime can be accessed using any modern web browser without installing separate plug-ins. Thanks to the web technologies used, the system can be accessed from anywhere in the world and at any time.

The first version of WinCC Unified is available for panel- and PC-based solutions. Use in the Edge and cloud environment will be possible in a later delivery stage. ■

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



## Highlights

- **Web technologies** such as HTML5, SVG, and JavaScript
- **ODK and OpenPipe interfaces** for easy data transfer
- **Connecting** the SCADA level to the MES and IT levels
- **Local backbone** for extensive data analysis and training of AI algorithms in other runtime environments, such as Edge apps





## Simatic HMI Unified Comfort Panels

# User-friendly, more powerful, and expandable with apps

The new generation of high-end, 7–22-inch operator panels, part of the new Simatic WinCC Unified System, boasts numerous improvements over the predecessor devices – including in terms of user-friendliness and visualization. Thanks to their capacitive glass front with multi-touch technology, the Unified Comfort Panels are as convenient to use as a smartphone or tablet. The sharp colors and contrast improve the readability and ease of use.

Visualization on the devices is based on the new Simatic WinCC Unified visualization system in TIA Portal and is suitable for scalable solutions, from machine-level applications to distributed SCADA solutions. This opens up many new opportunities and functionalities for the user – across all device sizes.

Brand-new to the Simatic HMI product portfolio is the option to expand functions with apps. Previously, HMI panels were used exclusively for visualization software. Thanks to the integration of Siemens Industrial Edge, users can now run other programs simultaneously alongside this standard device functionality. Project-specific requirements can thus be implemented quickly and easily. ■

› [siemens.com/unified-comfort-panels](https://www.siemens.com/unified-comfort-panels)

### Highlights

- **Visualization options** include
  - Consistent visualization based on Scalable Vector Graphics (SVG)
  - Extensive UI controls
  - Custom web controls
- Especially rugged **multitouch technology** optimized for industrial environments
- Improved **hardware performance** and **higher system limits** for significantly larger applications thanks to panel-based system
- Integrated **IT security** mechanisms to protect the plant against cyber attacks

## Simatic WinCC V7.5 SP1

# Connectivity for the digital enterprise



### Highlights

- **Simulation** of external variables (virtual commissioning)
- **Improved functionality** for plant diagrams on a tablet (HTML5 browser) including support for faceplates
- **Adaptations to the latest Microsoft operating systems** (for example Windows Server 2019, Windows 10 LTSC 2019)

The latest version of Simatic WinCC V7.5 SP1 offers a simple way for users to connect their plant data to cloud solutions, such as MindSphere, via a high-performance standard gateway. It can also connect to the new generation of Simatic S7-1500R/H fault-tolerant controllers. Moreover, the new version helps save time on configuration. Last but not least, users benefit from enhanced applications for WebUX. Overall, there is even more flexibility when accessing plant information. ■

› [siemens.com/wincc-v7](https://www.siemens.com/wincc-v7)

## Simatic WinCC Open Architecture V3.17

# Security and connectivity – on site and in the cloud

Simatic WinCC Open Architecture V3.17 provides users with a wide range of integrated interfaces for connecting their plants to the cloud, for example to MindSphere. In addition to a MindSphere Connector for using MindApps, the connection can also be made via MQTT or Node-RED. Alongside providing more flexible options for integration, security takes a high priority. This is confirmed by many awarded certifications. To achieve certification, the new

product version must provide functionalities in accordance with IEC 61443 4-2. An extension for a modern archiving system allows for more flexibility when connecting to databases. These functions ensure that WinCC OA V3.17 offers genuine added value for custom solutions. ■

› [siemens.com/wincc-open-architecture](https://www.siemens.com/wincc-open-architecture)



### Highlights

- **Support** for Siemens Industrial OS 2.0
- **Certification** to IEC 61508 up to SIL3, Profinet, Profisafe, and to IEC 61580
- **New archive interface** for SQL-type queries

## Simatic IOT2000

# Intelligent gateway for IoT solutions

### Highlights

- **TI ARM SoC, 64 bit**, up to 4 cores
- **2x Gbit LAN**, 2x USB, 1x serial, 1x Arduino interface, 1x mPCIe
- **Display port**
- **Internal eMMC memory** can be expanded with microSD card
- **Software** for IoT use case (such as node.js, cloud protocols)

IoT gateways make it possible to implement future-oriented production concepts in an existing plant. The new generation boasts significantly improved performance: Simatic IOT2000 brings together the latest generation of processors with 2 GB DDR4 RAM and integrated eMMC memory, and comes with Simatic Industrial OS preinstalled.

Simatic IOT2000 supports a range of communications protocols and programming languages. The gateway makes it possible to harmonize communication between the various data sources, analyze data on site, and forward these to the corresponding



recipients. As a result, it is easy to implement applications such as preventive maintenance and to connect production to the ERP level. The IoT gateway thus contributes to making production more flexible, reliable, and efficient. ■

> [siemens.com/iot2050](https://www.siemens.com/iot2050)

## Simatic IPC527G

# Cost-effective and versatile

The Simatic Basic IPC family welcomes a new member to the fold. With powerful processors, numerous interfaces, and support for legacy systems, Simatic IPC527G is suitable for a wide range of industrial applications. The compact box PC offers series machine builders

in particular a robust, low-cost platform. Application examples include industrial image processing, complex visualization tasks, and measuring/open-loop and closed-loop control tasks, especially using third-party software. Suitable for portrait, wall,

or desktop mounting, IPC527G is run-in tested for fast commissioning and is certified for use worldwide. ■

> [siemens.com/pc-based](https://www.siemens.com/pc-based)



### Highlights

- Optionally **Intel Core i5** or **Intel Pentium processor**
- Up to 32 GB **RAM, HDD**, or **SSD mass storage**
- Up to **four PCI/PCIe slots**, up to **four COM ports**, up to **six USB interfaces**, up to **three Intel Gigabit Ethernet connectors**, one **display port**, and one **VGA connector**

## Sitop PSU6200

# 3-phase devices with comprehensive diagnostics

Sitop PSU6200 is the new standard product line for powerful, rugged power supplies. Alongside the 1-phase 12-V and 24-V power supply units, there are now 3-phase 24-V power supply units with rated output currents of 5 A, 10 A, and 20 A. These extend the 24-V applications for connection to 400-V 3-phase networks. The 10-A and 20-A power supply units enable permanent condition monitoring via the diagnostics interface.

The plant will continue to be supplied with 24 V even in the event of a phase failure. Just like the 1-phase devices of the all-round Sitop PSU6200 power supply, the new 3-phase devices also have a high efficiency level of up to 95%. Reliable operation is safeguarded by the high overload capacity. The slim metal enclosure and fast wiring via push-in terminals make installation easy.

10-A and higher power supply units provide information on the current status and operating data. The LED display on the diagnostics monitor shows the status of the output voltage, the degree of utilization, and the end of service life. The diagnostics interface transfers more detailed values and counts under- and overvoltages at the output. The only item needed for diagnostics is a 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 Simatic WinCC. The comprehensive condition monitoring enables timely reaction to critical condition, thereby facilitating preventive maintenance. ■

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



### Highlights

- **Continuous operation** also possible on two phases
- **Active PFC** (power factor correction) for low reactive currents
- High **overload capacity**
  - 50% **extra power** for 5 s
  - **Constant current behavior** to prevent voltage drop in the event of high overloads
  - **Continuous operation** at 120% rated current and ambient temperatures of up to 45°C
- For devices of 10 A and above, **transfer of voltage and current values** and **temperature status** via diagnostics interface

## Digitalization in drive technology

# Generating valuable knowledge from data



From the process industry to manufacturing, drives are used in large numbers. Better machine and plant availability and process safety are issues of fundamental concern in industry. To obtain the necessary knowledge for appropriate improvements, the status and behavior of the drives must be inspected regularly.

Drive technology provides a suitable entry point into digitalization, for both manufacturers and users of machines and plants. Their objectives, however, differ greatly: whereas machine builders primarily want to improve their development processes and machine features, operators are more concerned with the stability, flexibility, and efficiency of their production and manufacturing processes.

No matter how different the standpoints are, drive features, status, and

behavior remain the central focus. Digitalization of the drive train supports machine builders and users throughout the value chain, from design to planning and engineering right through to production and service. A consistent database enables virtual commissioning, which, together with simulations and tests in the digital world, reduces the time required for real-world commissioning. With cloud applications, operational data can be collected, evaluated, and used to optimize operations. For instance, actual service requirements can be identified by monitoring the drive components.

The portfolio of Sinamics converters and Simotics motors combines proven hardware with innovative software to ensure transparency along the drive train as well as reliable operation. New interfaces and connectivity modules allow all components to be digitalized.

### Highlights

- **Efficient engineering tools** such as Sizer, DT Configurator, or Sinamics Startdrive
- **Connectivity modules** for connecting drives to the MindSphere cloud
- **Sidrive IQ** bundles the IoT offering – including MindSphere applications such as Analyze MyDrives for low-voltage drive systems or Sidrive IQ Fleet for low-voltage motors, plus Digital Services

Digital services support the digital transformation, all the way from consulting to implementation. From a Digitalization Check to Predictive Services to improve productivity, Siemens helps its customers to move forward on the path to digitalization. ■

› [siemens.com/digital-drives](https://www.siemens.com/digital-drives)

## Simotics low-voltage motors

# A digital motor in just a few steps

There is a plug & play solution for cloud-based monitoring of low-voltage motors available now, combining the Simotics Connect 400 connectivity module and Sidrive IQ Fleet. Installation takes only a few minutes. All the Simotics low-voltage motors in a plant, whether brand-new or already in use for years, can be made ready for connectivity and cloud-based analysis with this solution, and thus, integrated into the digital enterprise.

If Simotics Connect 400 is not already mounted on the motor supplied, it is mounted to the Simotics low-voltage motor. It only takes a few steps to make the connectivity module ready for use: open the cover, connect the battery, and close the box again. Commissioning continues with integration into a local WLAN network and onboarding into Sidrive IQ Fleet. This requires the Sidrive IQ Config Android app, available in the Google Play Store, and a Sidrive IQ Fleet

user account, activated via subscriptions. The connectivity module is configured using a smartphone or tablet, and onboarded for cloud-based data analysis. After commissioning, the motor is ready for secure communication to the cloud via WLAN and for remote data analysis.

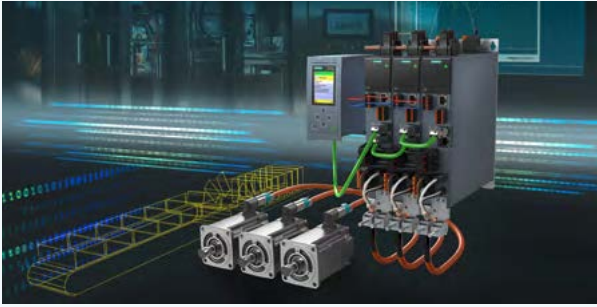
Simotics Connect 400 collects status data and transmits them automatically at selectable intervals to Sidrive IQ Fleet for cloud-based analysis. Specific algorithms can then be used to identify changing and anomalous operating behavior, such as excessive vibrations or temperatures, at an early stage. This considerably reduces the risk of unplanned downtimes resulting from motor failure, increasing the availability and productivity of the plant. ■

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



### Highlights

- For **Simotics low-voltage motors** with shaft heights 132 to 450
- **Acquisition** and **analysis** of **status data** such as
  - Vibrations and temperatures
  - Electrical operating data such as on/off status, speed, and power output
- Use of **historical data** possible
- **Efficient management** of motor fleet



## Sinamics S210

# High output, simple engineering

High overload capacity, dynamics, and precision: these characteristics make the Sinamics S210 single-axis servo drive system particularly suitable for use in packaging machines, handling, wood and ceramic processing, and digital printing. The drive system is now available in all output and supply voltage variants. The new three-phase device variants have an optional infeed rail system. A common DC link coupling reduces the waste heat generated and increases the travel cycle of the axes. The converter also boasts integrated safety features: in addition to STO, SS1, and SBC, users can activate extended safety functions such as SLS, SSM, SDI, and so on via an optional license. The Simotics S-1FK2 servomotors with single-cable technology, especially developed for the system, can be ordered with absolute single-turn or multi-turn encoders in 22-bit resolution. ■

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

### Highlights

- Midrange power range of 50 to 750 W at 1 AC 230 V and 0.4 to 7 kW at 3 AC 400 V
- **Can be used worldwide** thanks to approvals such as UL and supply voltage variants 1 AC 200–240 V and 3 AC 200–480 V
- Commissioning via **web server** or with **Sinamics Startdrive / TIA Portal**
- Ready for **Advanced, Open, and Software Simatic Controller**

## Sinamics S120 Chassis-2 and Cabinet Modules-2

# Fit for digitalization

### Highlights

- **Active Line Module:** higher clocking
- **Active Interface Module:** more stable and robust in response to grid conditions, additional ranges of RSC (rated short-circuit current – grid stability), more flexibility for hard and soft grids
- **Extended power range** for motor modules: 315–630 kW
- **Standardized spare parts** for motor modules and active line modules



The new Sinamics S120 Chassis-2 for the control cabinet and the ready-to-use, type-tested Cabinet Modules-2 stand for even more possible applications and greater reliability thanks to an improved cooling concept and increased alternating load capability. Infeed is now provided via 355 to 630-kW Active Line/Active Interface Modules. The improved design of the new converter generation, especially suited for the metal- and paper-processing industries and for cranes and conveyor belts, makes the engineering easier and faster. Thanks to the integrated condition monitoring, the modules are also equipped for digitalization. ■

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

## Sinamics V20

# Even more compact and space-saving than before

With Sinamics V20, Siemens offers a frequency converter that is simple to set up, compact, and cost-effective for basic applications. The new FSAD frame size in the 1 AC 200 V to 240 V voltage range and 2.2-kW to 3-kW power range supersedes the previous FSC frame size and is 32% smaller than its predecessor. This gives users even more flexible and space-saving options for use of the Sinamics V20 frequency converter. ■

> [siemens.com/sinamics-v20](https://www.siemens.com/sinamics-v20)

### Highlights

- **Smaller dimensions** at 176.5 x 136.6 x 158.8 mm
- Integrated **radio interference filter** according to EN 61800-3 category C1
- **Nine frame sizes** for a power range of 0.12 kW to 30 kW



## Sinamics G120

# Variants for cabinet construction



The modular, multifunctional Sinamics G120 frequency converter offers a new option: the Sinamics Control Unit Adapter Kit CUA20 permits an alternative cabinet construction. Installed to the left or right of the PM240-2 power module, the new adapter kit allows devices installed in the cabinet to be separated spatially and thermally from

the power module and control unit. It consists of the Power Module Interface (PM-IF) adapter for snapping onto the power module, the attachment adapter for the control unit, and the pre-assembled cable for connecting the two adapters. ■

> [siemens.com/sinamics-g120](https://www.siemens.com/sinamics-g120)

### Highlights

- **Power range** of 0.55 to 250 kW
- **Adapter kit** for DNV GL-certified cabinet constructions
- Compatible with **Sinamics CU230P-2, CU240E-2, and CU250S-2 control units** of the Sinamics G120 converter series



**Note:**

go to page 21 to learn more about

**Simatic Micro-Drive F-TM ServoDrive**

## Simatic Micro-Drive

# Servo drive for safety extra-low voltage

Simatic Micro-Drive is a versatile, seamless, safety-integrated servo drive that performs impressively in a wide variety of applications: high-precision positioning tasks, in production machines or innovative application areas such as shuttles for storage and retrieval machines and storage rack systems, and automated guided vehicle (AGV) systems. The drive can also be deployed in medical technology (for safe maneuvering of examination beds in MRIs and positioning of the ceiling-mounted arm in radiography), among many other applications.

The servo drive system for the safety extra-low voltage range can be used with flexible-use motors and plug-in cables from the Siemens Product Partner program. The motion control functions are completed with the appropriate controllers, such as

Simatic and Simotion. To ensure the drive technology complies with as many customer requirements as possible, Siemens utilizes the individual and supplementary products of selected partners (Dunkermotoren, ebm-papst, Harting, and KnorrTec) for the motors and plug-in cables. This gives users access to an individual combination of suitable products from the Siemens Product Partner Program.

Simatic Micro-Drive provides the ideal entry point into digitalization. Converters and motors are fully integrated into Siemens automation technology based on Totally Integrated Automation (TIA). Diverse tools for the entire machine building cycle also ensure highly efficient engineering and fast commissioning. ■

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

## Highlights

- **Fast and safe communication** via Profinet
- **Safety Integrated with additional new SLT function**
- **Custom-combinable** servo drive system
- **Easy commissioning and servicing** via TIA Portal

## Sirius 3RS2 temperature monitoring relays

# Second generation with more functions

The new Sirius 3RS2 temperature monitoring relays measure temperatures in solid, liquid, and gaseous media. Sensors detect the temperature in the medium; the device then evaluates it and checks whether it overshoots, undershoots, or falls within a working range (window function).

The family consists of an analog multifunctional device, which can be adjusted using rotary and sliding switches and potentiometers, and digital devices, which can be parameterized via an intuitive LCD display.

The function of the digital devices can be extended wirelessly with a sensor module via an SIL 1-certified infrared communications interface. This combination has three resistance sensors, for example for monitoring large 3-phase motors and transformers.

All the digital devices are safety-certified to IEC 61508/62061 or ISO 13849 up to SIL 1 / PL c and EN 14597, and burners to EN 50156. ■

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

### Highlights: digital

- **LCD display** with additional functionality (e.g. teaching, ecoMode, calibration, indication of warning values with color change)
- **Variants** for one **sensor**, two **threshold values**, all common **resistance sensors**, and **thermo-elements**
- **Manual and remote reset**, adjustable **auto reset**, and **memory** (the device status is stored even in the event of power failure)
- **Expandability** of the basic digital device for up to three sensors and analog input (4–20 mA)
- Also available with **IO-Link interface**

### Highlights: analog

- **Variants** for one **sensor**, one **threshold value**, Pt100 sensor types, and plus **thermoelements** J, K for the most common temperature ranges
- Compact and rapidly adjustable **two-point controller** (overshooting or undershooting)
- **Relay changeover contact outputs** for directly switching loads and simultaneously using the NC contact as a signaling contact
- Selectable **hysteresis** (5%, 10%, 15%, 20%)



## Sirius 3UG546 DC load monitoring relay

# Multifunctional for DC applications

The Sirius 3UG546 DC-load-monitoring relay is a compact device with bundled functionality for measurement, monitoring, and data transmission. It checks whether the direct current (DC load circuit), the voltage, and the actual power output overshoot or undershoot set limit values. This can be done separately for current, voltage, and power.

Besides providing detailed fault diagnostics, the integrated operating hours counters and operating switching cycle counters can also be read out and reset, thereby allowing appropriate preventive maintenance of the plant. The compact relay can distinguish the direction of current flow and can thus, for example, separately record the quantities of energy stored in or drawn from a battery.

Finally, the 3UG546 DC-load-monitoring relay also transmits the measured and counter values and diagnostic reports to the controller via Profinet. Since the signaling and switching functions are performed via an internal relay output, however, reliable fault reactions are also possible without Profinet. ■

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



### Highlights

- One- and two-channel **monitoring**
- **Separate detection** of power consumption and energy recovery
- **Commissioning, measured values, and status information** via Profinet
- **Operating voltage range** of 0 to 800 V
- Two **variants in the current range**: 22.5-mm overall width with 2x8 A / 1x16 A, 45-mm overall width with up to 63 A

## Sirius 3RW5 soft starters

# Start softly and stop safely



The Sirius 3RW family of soft starters has grown: the compact Sirius 3RW50 soft starters with a high level of functionality for standard applications and the high-performance Sirius 3RW55 failsafe soft starters with integrated safety technology including Safe Torque Off (STO).

The Sirius 3RW50 soft starters offer high flexibility in their possible applications thanks to optional HMI modules for installation in the control cabinet door, optional communication modules (Profinet/Profibus, Modbus, EtherNet/IP), and analog output or thermistor motor protection. The devices avoid current peaks during start-up and, at the same time, reduce the mechanical load. Thanks to the soft torque function, pressure peaks in the pipeline system, in particular during pump stopping, and hence damage resulting from water hammer can be avoided. Tested combinations with circuit breakers, contactors, and safety devices not only save time but also costs, and allow the soft starters to be used worldwide. ATEX/IECEX certification means that the Sirius 3RW50 soft starters can also be used in potentially explosive areas, for example for pumping kerosene or gasoline in airports or filling stations.

The new high-performance Sirius 3RW55 failsafe soft starters provide economical, failsafe solutions for a broad spectrum of applications. For the first time, safety technology is integrated in these soft starters, including STO. This allows them to perform even difficult starting and stopping procedures and to ensure safety-oriented, reliable switch-off. The failsafe soft starters can be used

flexibly thanks to integrated HMI and optional communication modules (Profinet/Profibus, Modbus, EtherNet/IP). ■

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

## Highlights

- **Sirius 3RW50 soft starters**
  - **Power output range** of 75 to 315 kW (at 400 V)
  - Optional **communication link**
  - **Visualization** of motor data via optional **HMI**
  - **Compact**, space-saving **design**
- **Sirius 3RW55 Failsafe soft starters**
  - **Power range** from 5.5 to 560 kW (at 400 V)
  - **Safety-oriented switch-off** for SIL 1/ PL c to SIL 3/ PL e and integrated **Safe Torque Off (STO)**
  - **Saves space, components, and time**
  - **Connection** to the **automation system** (Profinet, Profibus, Modbus, EtherNet/IP)

## Sirius 3RF24 solid-state contactors

# More compact switching

Solid-state contactors consist of a semiconductor relay plus an optimized heat sink and are therefore ready to use. The 3-phase Sirius 3RF24 solid-state contactors for switching resistive loads are specifically suitable for applications with 3-phase current. Thanks to new, smaller heat sinks, the solid-state contactors are now much more compact than before, saving space in the control cabinet and making installation easier. ■

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

### Highlights

- **Side-by-side mounting** without derating
- **Five variants** for a current range of 10 to 50 A
- **2- and 3-phase** versions



## Simatic ET 200SP motor starters

# Extended power range



Four new devices have been added to the Simatic ET 200SP motor starter family: offering the same functionality, the new motor starters cover a lower power range from 0.1 to 0.4 A. This makes them particularly suitable for use in fans and auxiliary drives (coolant pumps).

The motor starters are part of the Simatic ET 200SP distributed I/O system and are available with safety and standard functions. The devices have integrated hybrid switching technology and, with a compact width of 30 mm, take up only a small amount of space in the control cabinet. The

motor starters protect single- and 3-phase motors from overloading and short-circuiting during starting. They also transmit current values, which can be used for power management functions. ■

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

### Highlights

- **Group shutdown** of fail-safe motor starters via the F-DI rail of the new BaseUnits saves wiring
- **Comprehensive diagnostic view** directly in TIA Portal V15.1 and higher
- **Firmware V1.2.0** with new functions
  - Manual control function in TIA Portal V16 and higher
  - Parameters can be changed permanently via HMI
  - Cold start now also with fail-safe motor starters
  - CLASS-OFF operation available
  - Clear diagnostics when main voltage or load not present
- Fail-safe variants can be used up to an **altitude of 4,000 m**

## Simatic Ident portfolio

# More data for greater transparency

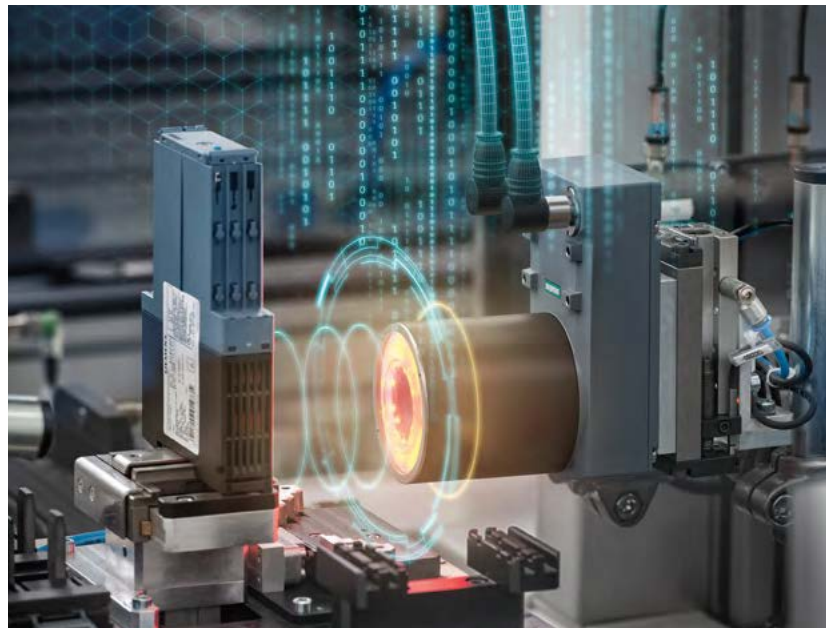
Siemens is making it even easier for companies to implement their digitalization strategies by continuously developing its Simatic Ident portfolio. For instance, the integrated and scalable RFID and optical identification systems allow innovative identification solutions to be realized.

With the Simatic Ident portfolio, users can seamlessly track the location and status of each product or component. Simatic Ident records production data at strategically relevant points, processes them, and then transfers them to the cloud, where they are analyzed. This delivers transparency to the production and logistics process in digital companies, regardless of the equipment manufacturer. As a result, production processes and supply chains can be optimized, leading to increased efficiency and quality in production, logistics, asset management, and other areas across all industries.

Helping to meet the challenges of the digital world, the Simatic RF600 UHF RFID system and the new Simatic RF18xC/RF18xCI series of communication modules support OPC UA as the IoT interface. This enables manufacturer-independent communication in automation and a standardized connection to cloud applications via an Industrial IoT gateway, such as Simatic CC716 (in preparation). The new communication modules also implement HF-RFID-based digitalization solutions

in industrial automation and pave the way for connecting the Simatic RF200 and RF300 systems to the cloud. The Simatic MV500 series of optical readers can also connect reliably and easily to cloud platforms such as MindSphere, the cloud-based, open IoT operating system from Siemens, via the Simatic S7-1500 controller and the CP1545-1 communications processor – opening up whole new possibilities for data usage. ■

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



## Highlights

- **Key technology** for the digital enterprise
- **Easy**, standardized, and reliable **connection to cloud platforms** via an Industrial IoT gateway or Simatic S7-1500 and CP 1545-1
- **Direct integration** of components **into TIA Portal** for fast configuration

## Simatic MV560 U

# High resolution with double RAM

Thanks to its high image resolution, the new Simatic MV560 U optical reader is especially suited to reading very small codes in large image fields or a high number of codes on large objects. Its compact design and IP67 degree of protection make it ideal for use in industrial environments with limited space.

Its large RAM enables Simatic MV560 U to read codes even in production lines with very fast-moving workpieces. Since a series of images is stored directly on the reader, and therefore staggered reading is also possible, even fast-moving objects can be reliably captured. In addition, the high-capacity RAM means that even large volumes of diagnostic information such as fault images can be stored directly on the device and rapidly retrieved if required. Diagnostics can thereby be improved, plant availability increased, and downtimes considerably reduced, without investing in additional infrastructure.

The modular structure of the readers in terms of optics and illumination makes Simatic MV560 U suitable for a wide range of production conditions. Thanks to the automatic focusing and software-controlled illumination, the camera can also be used for mixed operation with changing objects.

Configuration is conveniently carried out via web-based management (WBM) and integration in TIA Portal. Moreover, one-button configuration for network parameters enables IP addresses for a connected PC to be assigned automatically. One-button configuration for read parameters, by contrast, allows the read parameters, the lens focus, and the illumination to be automatically set directly on the device without opening the web-based management. ■

› [siemens.com/optical-identification](https://www.siemens.com/optical-identification)

## Highlights

- **SCAN mode** for separating image capture and image processing
- **Additional Gigabit Ethernet interface** for transferring fault images without disrupting communication with the controller
- **Customizable accessories** such as E-Focus lenses and flexibly controllable built-in ring lights
- **Connection to cloud applications** via Simatic S7-1500 and CP 1545-1 communication processor
- User-friendly thanks to **one-button configuration**
- Developed and made in **Germany**



## Simatic RF610R

# Ultra-compact



### Highlights

- Particularly **compact design** at 133 x 133 x 45 mm
- **Cost-efficient**, with no digital inputs or outputs and no external antenna port
- **Standardized connection to cloud platforms** via an Industrial IoT gateway
- **Easy integration** in the Simatic automation environment
- Maximum reliability during read/write process thanks to **"UHF for Industry" algorithms** – even in difficult radio environments

Simatic RF610R is a compact reader with an integrated, circularly polarized antenna. Its small dimensions make it particularly suitable for installation where space is limited, for example within mechanical and plant engineering, and conveyor systems. This allows it to be used as a direct read point within an installation, achieving read/write ranges of up to 1 m.

Simatic RF610R readers make light work of commissioning, troubleshooting, and service. For instance, users can access configuration, commissioning, and diagnostics tools via a web browser and can monitor operating statuses and error messages by means of an LED status display that encircles the device. Since the reader supports the OPC UA interface next to Profinet and Ethernet/IP, manufacturer-independent communication within automation technology is possible, as is secure and easy connection to cloud platforms, such as MindSphere. ■

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



## Simatic RF166C

# Transparency in Profibus networks

ration and diagnostic data via the function block in the Simatic controller, web-based management is now also available for a Profibus module (via an additional Ethernet connector). Error messages and operating statuses can also be indicated by means of LEDs.

The new communication module offers the option of running Profibus in parallel with the OPC UA function. The Profibus results can thus be forwarded to an OPC UA client – either a PC or a cloud application. This requires an Industrial IoT gateway, such as Simatic CC716 (in preparation). ■

› [siemens.com/communication-modules](https://www.siemens.com/communication-modules)

The new Simatic RF166C communication module allows up to two Simatic RFID readers or Simatic MV series optical readers to be integrated into Profibus networks. Two connectors each for Profibus and the power supply support the setup of a Profibus line topology without additional Y connectors. Simatic RF166C has various features that make commissioning, diagnostics, and servicing easier. As well as access to configu-

### Highlights

- **Supports OPC UA** as IoT interface via Ethernet
- **L-coded M12 connectors** enable a high current feedthrough of up to 16 A
- Grounding via a fastening screw for **high electro-magnetic compatibility**
- **Profibus address** visible at all times through transparent cover caps
- Developed and made in **Germany**



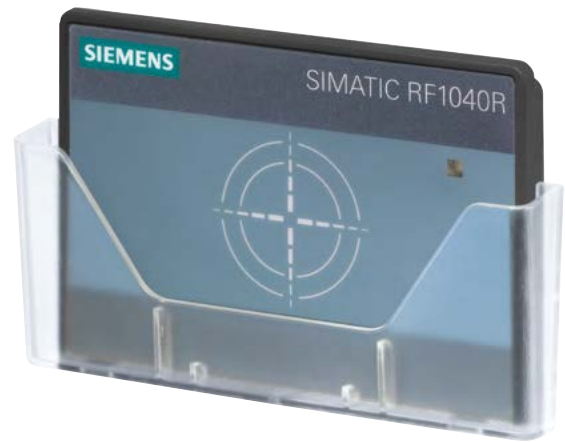
## Simatic RF1040R

# Access control for machines and plants

Electronic access management based on existing employee IDs is user-friendly and cost-effective. Operating personnel can be identified and access to machines documented by controlling access rights individually. With the new Simatic RF1040R reader, companies can now also use existing employee IDs to control access to machines and plants when these are based on the low-frequency range (LF, 125 kHz). As well as the low-frequency range, Simatic RF1040R meets the high-frequency system standards ISO 14443 A/B (Mifare – contactless chip card technology) and ISO 15693. Securing and documenting access to equipment in this manner prevents operating errors.

Thanks to the compact design and IP65 degree of protection (when installed), the reader is particularly suitable for use in industrial environments with limited space at temperatures from -25°C to +55°C. ■

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



## Highlights

- **Config card** for customer-specific parameterization of the reader
- **USB interface** for integration into software applications, and hardware solutions such as HMIs or panels, or control infrastructures
- **Serial RS232 interface** for connection to the Simatic RF170C communication module, the Simatic ET 200SP distributed I/O system, PCs, and third-party HMIs

## CloudConnect

# From sensor to cloud

Cloud computing is a key factor when it comes to reaping the benefits of digitalization in industry. It can improve product quality via big data analysis of all relevant parameters, allowing operators to evaluate globally important key performance indicators regarding the use of machines or robots from different manufacturers, and thus providing higher availability. The technology also opens up new pay-per-use marketing models for machine builders.

In order for these applications to work, they need to be fed with field-level data. Power consumption, temperature, vibration, movement speed, and the corresponding curve progressions over time can be used to draw conclusions about plant statuses and process quality. Combined with further information, such as the material used, the specific supplier, or the status of the tools used, this opens up whole new possibilities for optimizing processes.

With its CloudConnect products, Siemens offers a professional way to transfer data for process optimization to a wide variety of cloud platforms, such as MindSphere, Microsoft Azure, or Amazon Web Services (AWS). ■

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



## Highlights

- **Simatic CP 1545-1:**  
Easy and professional transfer of Simatic S7-1500 field-level data to cloud systems
- **Simatic CloudConnect 7:**  
Connect existing S7 plants to the cloud simply via Ethernet or Profibus/MPI
- **Ruggedcom RX1400 with CloudConnect:**  
Plug & play router for IIoT data transfer to cloud-based solutions



## Simatic CP 1545-1 communications processor

# Realize modern TIA installations

## Highlights

- **Integrated SPI** (stateful packet inspection) **firewall** for protection against unauthorized access
- **Trigger management** for event-driven and cyclic communications
- Full **integration in TIA Portal**

Simatic CP 1545-1 with CloudConnect functionality enables easy, reliable, and secure transfer of all data from Simatic S7-1500 to MindSphere or to a cloud solution that supports the standardized MQTT protocol. The CloudConnect function of CP 1545-1 is easy to configure using a small number of input masks in TIA Portal: After all the necessary parameters for the different cloud platforms are specified, the data intended for the cloud are selected from the Simatic S7-1500 data tags and stored as topics to be transferred,

with appropriate trigger conditions. The CP reduces the data volume by transferring the individual data points in different cycles or only when the value falls outside of a defined range.

Simatic CP 1545-1 supports connection to additional automation devices, such as HMI and so forth, in parallel with the connection to cloud applications, via Industrial Ethernet using the Simatic S7 protocol. ■

> [siemens.com/cp1545-1](https://www.siemens.com/cp1545-1)

## Simatic CloudConnect 7

# Intelligent connection of existing plants



### Highlights

- **Simatic CC712:** Connection of Simatic S7-300 or S7-400 via Industrial Ethernet using S7 protocol
- **Simatic CC716:** Connection of up to seven Simatic S7 controllers via Industrial Ethernet or Profibus /MPI interface
- **Fast and error-free configuration** due to data transfer from Step 7
- **Reduced network load and costs** for data exchange thanks to event-driven communications

With the Simatic CloudConnect 7 Industrial IoT gateway, even existing plants can be connected quite easily to a wide variety of different cloud platforms that support the standardized MQTT protocol, for example, MindSphere, Microsoft Azure, or IBM Cloud. The key information can be selected and transferred without having to modify the existing automation program.

The connection to cloud systems via the Internet or mobile wireless networks is made either via an existing infrastructure or directly in combination with Scalance M Industrial Ethernet routers. The data read from S7 stations by Simatic CloudConnect 7 can also be made available as OPC UA tags (server). This allows standardized data exchange with, for example, MES systems, HMI systems, or other manufacturers' controllers. ■

› [siemens.com/cloudconnect7](http://siemens.com/cloudconnect7)

## Ruggedcom RX1400 with CloudConnect

# Many ways to the cloud

Siemens has added new functions to the network components for harsh environments: The robust Ruggedcom RX1400 plug & play cellular router is now also available with CloudConnect functionality. The router makes it 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 multifunctional capability of Ruggedcom RX1400 with CloudConnect allows end devices to be connected via wireless LAN, serial, copper Ethernet, or fiber Ethernet connections. The connection to the cloud is made either via LTE or via copper/fiber Ethernet. This connectivity gives users a high bandwidth for remote locations. Thanks to its extended temperature range from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , Ruggedcom RX1400 with CloudConnect can also be used in harsh conditions. This makes it the ideal device for IIoT data acquisition in industries such as electrical power, transportation, or oil and gas. ■

› [siemens.com/rx1400](http://siemens.com/rx1400)

### Highlights

- **Plug & play cellular router** for data acquisition, filtering, and conversion
- **IIoT data transfer** to cloud-based solutions
- **Trigger management** for event-driven and cyclic communication



## Scalance XC-200G

# Gigabit switch for high bandwidths

The Gigabit versions of the Scalance XC-200 Industrial Ethernet switches are perfect for building high-performance network infrastructures. Thanks to their high data rate of up to 1 Gbit/s, the switches are suited for conventional automation tasks, but in addition they are especially 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. Production batches can thus be documented precisely. Permanent monitoring of the fiber-optic segment increases the reliability of data communications and helps to avoid downtimes in plants. The Scalance XC-200G devices have the same housing design as that of Simatic S7-1500 as well as reduced port depths, making them well-suited for installation in control cabinets. ■

› [siemens.com/xc-200](https://www.siemens.com/xc-200)



### Highlights

- Up to 24 **electrical** and 4 **optical ports** with a bandwidth of 1 Gbit/s
- **Profinet and Ethernet/IP diagnostics** for integration into different automation solutions
- **H-Sync functionality** for use in high-availability control concepts
- Approval for **trackside rail applications**



## Scalance W1748 Client Module

# IWLAN for demanding industrial environments

### Highlights

- **High performance** with **max. 1733 Mbit/s** gross data rate
- Can be installed outside the control cabinet thanks to **IP65 protection class** and screwed **M12** and **N-Connect connections**
- **Seamless redundancy via WLAN with iPRP** (industrial Parallel Redundancy Protocol)

The new Scalance W1748 Client Modules transmit in line with the current IEEE 802.11ac Wave 2 Wi-Fi standard. Possible applications include networks with high user density or systems requiring high-performance transfer of video data. The Client Modules have innovative MU-MIMO (Multi-User Multiple Input Multiple Output) technology for even more efficient data throughput when connecting wireless devices with particularly high bandwidth requirements. A Scalance W1788 Access Point can use this to communicate simultaneously with several Scalance W1748 clients.

The switch integrated in the client has two Gigabit Ethernet ports that provide a high-performance connection between devices on mobile applications, such as cranes or automated guided vehicle (AGV) systems. Redundant wireless communication, which can be enabled using the iPRP iFeature via the CLP removable data storage medium, guarantees reliable data transfer. The new generation of devices in this family fit seamlessly in the existing portfolio thanks to the time-tested Scalance W configuration interfaces. ■

› [siemens.com/scalance-w1748](https://www.siemens.com/scalance-w1748)

## Simatic RTU3000C / RTU3041C

# New fields of use in LTE-M/NB-IoT networks

The Simatic RTU3000C remote terminal unit is now available in an additional hardware version: Simatic RTU3041C with LTE-M/NB-IoT networks and GPS connection. The new remote terminal unit gives users new possibilities, with greater ranges and thus better network coverage thanks to the LTE-M and NB-IoT (Narrowband Internet of Things) radio technology standards. Modes with lower power consumption are also available.

The compact RTUs are optimized for low-power operation and are suitable for off-grid use in environments without a mains power supply. The

RTUs are configured via web-based management. Connection to the telecontrol network is made via an integrated mobile wireless modem or industrial router, such as Scalance M. Simatic RTU3031C and RTU3041C with GPS (Global Positioning System) also cover applications requiring positioning.

Firmware version 3.1 and higher of Simatic RTU3000C allows user-friendly remote access to Modbus RTU or HART sensors for remote maintenance applications. Simatic PDM (process device manager), a manufacturer-independent tool for the configuration, diagnostics,

and maintenance of intelligent sensors and field devices, is used for this purpose. The process data collected by the remote terminal unit are provided with a time stamp and transferred to the control center via telecontrol protocols. Data can also be read via remote connection. With firmware version 3.1 and later, RTU3000C also supports connection to a redundant DNP3 master, more efficient encryption mechanisms, faster dial-in time in the mobile wireless network, and additional logging functions. ■

› [siemens.com/rtu3000c](https://www.siemens.com/rtu3000c)

### Highlights

- **Connection of HART sensors** via the HART/RS485 extension board
- **Remote access** to the connected Modbus RTU or HART sensors by means of Simatic PDM
- **Support for the telecontrol protocols** IEC 60870-5-104, DNP3, Sinaut ST7, and TeleControl Basic
- **Low-power operation**, power supplied by batteries, rechargeable battery with solar panel, or DC 12- to 24-V power supply unit



## Sinema Remote Connect V2.1

# Even more efficient and transparent remote access



### Highlights

- **Central user management** with connection to Active Directory
- Secure connection to **higher-level monitoring and analysis systems**
- Transparency by logging all actions in the central **Syslog server**

The new version 2.1 of Sinema Remote Connect enables secured remote access to distant machines and plants. Security-relevant activities can now be logged in the Sinema Remote Connect server, making user activities and any potentially critical system events transparent. Logging takes place locally in the Sinema Remote Connect server and centrally in the Syslog server. The logged events can be forwarded securely by means of Syslog TLS to, for example, higher-level security information and management (SIEM) systems.

The connection to a user management component (UMC) system enables central user management and a connection to Active Directory. Existing users and groups can then be integrated easily from central systems. This makes remote access with Sinema Remote Connect even more efficient and transparent, since all rights are assigned centrally and all actions are logged centrally. ■

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

## Sinec NMS

# Security management for industrial networks



### Highlights

- **Firewall and NAT management** with device-specific **rules** to protect series machines against unauthorized access
- **Policy-based configuration** of the network infrastructure
- **Connection to Syslog server** to forward audit log entries or system events

The challenges for digital companies in the age of Industry 4.0 encompass managing highly complex network structures as well as keeping track of all the security-related issues in the network. With Sinec NMS V1.0 SP1, several tens of thousands of devices in differently sized and segmented networks can be monitored, managed, and configured centrally – both in the

factory and in process automation. The new V1.0 SP1 version of Sinec NMS provides central, policy-based firewall and NAT (network address translation) management. It can be used to configure firewall components conveniently and efficiently from a central point. Sinec NMS also offers a local documentation function via audit trails. Audit log entries can thus be

tracked by automatically documenting user activities using a time stamp. This saves time and effort during auditing procedures and also provides evidence that the data are audit-proof. This audit log information can be forwarded via the Syslog interface in Sinec NMS to a central point for further analysis. ■

› [siemens.com/sinec-nms](https://www.siemens.com/sinec-nms)

## Ruggedcom APE1808

# A utility-grade platform for cybersecurity and Edge computing

The Ruggedcom APE1808 is the latest utility-grade application processing engine (APE) for the RX1500 Multi-Service Platform product family. It can run commercially available Siemens and third-party applications, dispensing with the need for an external industrial PC. It provides a standards-based platform to run advanced cybersecurity applications such as Intrusion Detection System (IDS), Deep Packet Inspection (DPI) and Next Generation Firewall (NGFW) from industry leaders in cybersecurity. The APE1808 can operate from  $-40$  to  $+75^{\circ}\text{C}$  making it suitable for mission-critical applications in industries with harsh environments, including electrical power, oil & gas, and transportation.

Ruggedcom APE1808 can be inserted in devices from the RX1500 family of products and allows for seamless integration of Edge applications into the network architecture, thereby expanding the open Siemens Industrial Edge ecosystem to harsh environments. Even demanding data processing tasks such as network traffic analysis can run natively on APE1808 functioning as an Edge device, eliminating any further hardware investment in additional Edge computing resources.

Ruggedcom APE1808 offers much-needed flexibility in a fast-changing landscape as the hardware backbone for software solutions for industrial cybersecurity and Edge computing. ■

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

### Highlights

- Intel quad-core **x86\_64 architecture**
- **8 GB RAM, 64 GB storage**, and TPM support
- Available with **Debian Linux** or **Windows 10 IoT Enterprise**
- **Interfaces:** display port video connector, micro SD card slot, 2 × USB 3.0 ports, 2 × Gigabit Ethernet ports



## Electrification in the digital age

# Energy data in the cloud

Right from the planning stage, software is used today to generate digital twins of power distribution systems, to test interactions between electrification and automation components, and to plan end-to-end solutions. Thanks to the integration of protection, switching, and measuring devices into TIA Portal and the Energy Suite, configuration and power data are also available in the automation environment. This results in coordinated, simplified engineering and production processes.

The power and status data are first collected using Sentron protection, switching, and measuring devices installed, for example, in Sivacon S8+ switchboards and Sivacon 8PS busbar trunking systems. These data can then be visualized directly on the Simaris control diagnostics station of Sivacon S8+ – the digital twin of the switchboard – and transmitted to power management, automation, or cloud systems such as MindSphere for further processing. Analyzing the data reveals starting points for improving energy efficiency and, using the health function of Simaris control, for predictive maintenance. This allows impending faults to be recognized in good time, thereby minimizing downtimes.

The 7KN powercenter3000 IoT data platform enables the power distribution to be connected easily to the IoT (Internet of Things). This platform gathers and processes power and status data, and serves as the central interface to local monitoring systems and to open IoT platforms, such as MindSphere. A cloud connection can thereby easily be added to existing power monitoring systems. The power-manager power monitoring software is now also available with a direct cloud connection. The software displays electrical characteristics for individual devices or entire plants in dashboards and analyzes power consumption values.

The Sivacon 8PS busbar trunking systems with powerline technology allow data from the measuring and switching devices installed in the tap-off unit to be forwarded directly via the conductors on the busbar trunking. An additional data cable is no longer needed. Existing systems can easily be retrofitted with powerline modules, and busbar runs can be quickly added at any time. ■

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



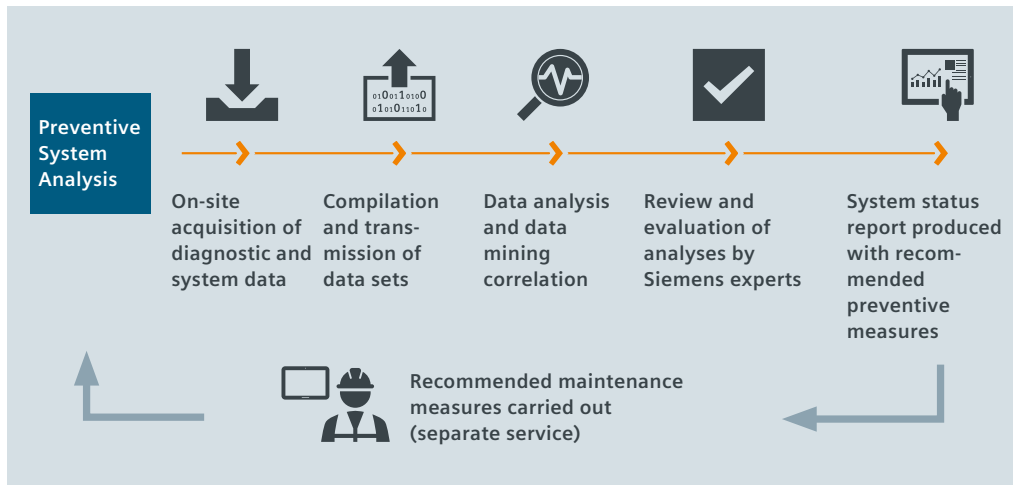
### Highlights

- **Easy integration** of electrical power distribution in **MindSphere**
- **Transparent power flows** for greater efficiency and availability
- **Simplified retrofitting** of existing plants with IoT connection



## Preventive System Analysis

# Analyzing diagnostic and system data



### Highlights

- Fast **data acquisition**
- Intensive **data analysis**
- Transparent **reporting**

Preventive System Analysis identifies potential risks in the system and presents a transparent view of the plant situation. Specialized software tools collect extensive diagnostic data and system information, which are, in turn, analyzed using algorithms.

Siemens experts then complete the assessment of the condition of the Simatic automation system by providing a professional opinion. Operators can thus optimize maintenance and avoid unplanned plant downtimes through regular assessments of the

system status, data-based inspections, and automated identification of weak points. ■

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

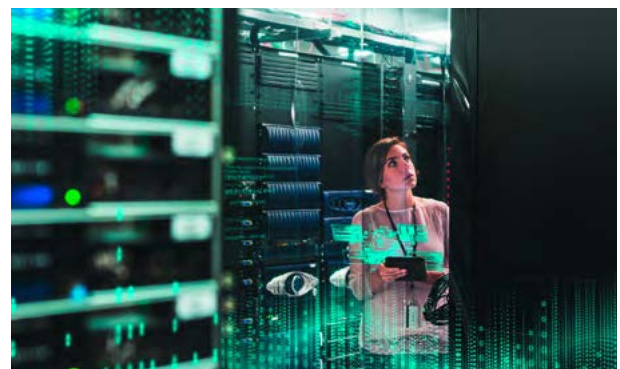
## Industrial Automation DataCenter

# IT infrastructure for the digital enterprise

Industrial Automation DataCenter is a preconfigured, pre-installed, and ready-to-use IT platform, with virtualized software applications, supplemented by suitable hardware and software components for backup, archiving, networking and security in industrial environments. Hardware variants enable individual scaling of the DataCenter including complete lifecycle services, spare parts, and online support.

This all-in-one data center is designed for customers who not only rely on virtualization for maintenance and modernization, but also value the user-friendly archiving and backup solutions in combination with virtualized systems. The main users are to be found in process industry plants using Simatic PCS 7, TIA Portal, or WinCC. ■

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



### Highlights

- **Preconfigured** and **preinstalled**
- **Service package** included
- **Security measures** implemented

MindSphere

# Leverage emerging IoT technologies

MindSphere is the cloud-based, open Internet of Things (IoT) operating system from Siemens that allows companies to connect factory machines and systems anywhere in the world to a central cloud location – ensuring complete operational transparency. Companies can then aggregate data points of specific assets to facilitate deep analysis and to identify actionable, transformative business insights.

The most successful path to complete digitalization with an IoT platform includes a number of steps and stages that result in iterative connections to various product lifecycle management (PLM) tools – making them better able to collect, process, analyze, and act on data. As a guide, Siemens developed the Digital Maturity Model: a phased, planned approach to IoT adoption that provides the targeted outcomes organizations must achieve to get the full advantage of the IoT.

Aligned with the Digital Maturity Model, Siemens offers three sets of solution capabilities that guide companies through the initial IoT deployment: Connect & Monitor, Analyze & Predict, and Digitalize & Transform.

### Connect & Monitor

Connect & Monitor solution capabilities enable businesses to connect critical assets, maintain complete operational transparency, and take action to optimize the performance and health of machines and processes. Asset condition monitoring and asset performance management increase production efficiency and thus, profit.



### Analyze & Predict

Analyze & Predict solution capabilities enable manufacturers to use integrated data sets and state-of-the-art data analytics to gain deep insights and to predict and prevent unexpected downtime thanks to real-time alerts and root-cause analysis of operational assets. This leads from preventive maintenance to predictive and prescriptive maintenance.

### The Siemens Digital Maturity Model



## Digitalize & Transform

Digitalize & Transform solution capabilities range from developing a closed-loop digital twin to building powerful targeted applications. Quickly develop new services and business models with open APIs and Mendix. Furthermore, an end-to-end digital twin can speed up development, optimize manufacturing processes, and leverage real-time insights to improve new product iterations.

## The closed-loop digital twin advantage

Data collected with Industrial IoT platforms provide detailed insights into real-world manufacturing processes. By taking the live operational data – the digital twin of performance – and feeding these back into high-fidelity digital twin models, companies create digital threads that run from product to production to performance and back again. ■

[siemens.com/mindsphere](https://www.siemens.com/mindsphere)

## Strengthen IoT analytics

When getting started with the IoT, the sheer volume of collected data and how to use it can be a challenge. MindSphere not only makes big data available for businesses, but also provides the necessary tools for analysis:

- **Integrated Data Lake (IDL):** The MindSphere IDL securely collects and stores data across all industrial assets and backend systems – whether structured, semi-structured, or unstructured – strengthening analytics by providing access to multiple data sources.
- **Semantic Data Interconnect (SDI):** The MindSphere SDI tool enables comprehensive analytics by creating data-driven relationships across disparate systems and domains, correlating it with contextualization and thus identifying data patterns, profiles, and insights.
- **Cross-Tenancy:** Two or more MindSphere tenants can securely share, exchange, or maintain data among themselves by identifying and granting access to specific data sets. Data sets are identified by one or more assets, sub-assets of an asset, or a complete sub-tenant.
- **Connectors:** MindSphere IoT extension tools provide comprehensive, multi-layer connectivity that expands the number of protocols that can securely communicate directly with MindSphere. Various field protocols are supported along with more hardware connectivity agents for creating direct connections to production assets.
- **Mendix:** Leverage low-code/no-code application development software, directly integrated into MindSphere, to quickly customize platform capabilities.
- **Open Edge streaming analytics:** The cloud-to-Edge capabilities of MindSphere streaming analytics allow companies to develop, deploy, and manage models from a common cloud backend and reduce decision latency by processing streamed data in near real time. Edge-based processing of analytics models reduces the bandwidth required for upstreaming. SAS-based model-driven streaming analytics allow better and faster decisions closer to the source.
- **Bulk analytics:** Easily perform bulk analysis on aggregated historic and current operational data. For example, access powerful applications such as Predictive Learning and Product Intelligence (PI). Predictive Learning builds predictive models based on machine learning techniques. PI searches and analyzes billions of contextualized supplier, manufacturer, and customer field data events in seconds, providing a complete picture of the entire value chain and closing the loop between design and product performance.



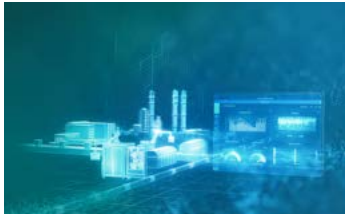
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Published by  
Siemens AG

Digital Industries  
Factory Automation  
P.O. Box 48 48  
90026 Nuremberg  
Germany

For the U.S. published by  
Siemens Industry Inc.

100 Technology Drive  
Alpharetta, GA 30005  
United States

For further information please visit: [siemens.com/tia](https://www.siemens.com/tia)

Article No. DIFA-B10044-00-7600  
Dispo 07900 BR/20-0010 PAS 111912.0 48 En

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