Totally Integrated Automation – The bigger picture

Overview of product portfolio for Factory Automation

siemens.com/tia
Efficiency and productivity are decisive success factors for manufacturing industries. Engineering plays a central role in this especially as it relates to ever more complex machinery and plants. For that reason, a high level of efficiency is already demanded at the engineering stage, as the first step toward better production: faster, more flexible, and more intelligent. Siemens has an intelligent answer to this: Totally Integrated Automation.

Making things right with Totally Integrated Automation

Totally Integrated Automation, industrial automation from Siemens, is the name given to efficient interoperability of all automation components. The open system architecture covers the entire production process and is based on the consistent presence of shared characteristics: consistent data management, global standards, and uniform hardware and software interfaces.

New productivity standards thanks to Totally Integrated Automation. Integrated technologies for greater customer benefits

Consistent use of shared characteristics

Totally Integrated Automation allows for the holistic optimization of the production process:

- Time and cost savings due to efficient engineering
- Minimized downtime due to integrated diagnostic functions
- Higher flexibility in production due to integrated communication
- Plant and network security due to integrated security functions
- Protection of personnel, machinery, and the environment with seamlessly integrated safety technology
- Improved quality due to data consistency
- Simplified implementation of automation solutions due to global standards
- Better performance due to interoperability of system-tested components
- Maximized availability at optimized costs with product-, system- and plant-specific services
Added value in all automation tasks
Totally Integrated Automation creates value added in all automation tasks

Totally Integrated Automation, industrial automation engineering from Siemens, is the name given to efficient interaction between all the automation components. The open system architecture covers the entire production process and is based on the consistent presence of shared characteristics: consistent data management, global standards, and uniform hardware and software interfaces. These shared characteristics minimize engineering time. The result: lower costs, reduced time to market, and greater flexibility.
The engineering of machines and plants is becoming increasingly complex. As a result, engineering costs rise.

Totally Integrated Automation enables consistent data management through standardized interfaces.

This means:

- Less complexity
- Always up-to-date data
- Parallel processes

and creates an integrated engineering workflow.

The result:

- Faster engineering
- Reduced engineering costs
Industrial processes are becoming increasingly difficult to handle, value chains are becoming more and more complex, and resources, assets, and processes require far more precise controlling.

How to always make the right decision?

Industrial Data Management turns simple data into valuable information, thus enabling company-wide access to plant data in real time.

Industrial Data Management with Totally Integrated Automation is the basis for confident decisions.

- This enables efficient diagnosis ...
- reduction of downtime ...
- and optimized resource utilization
- for example in operational energy management

Availability | Productivity | Quality | Flexibility
Modern and intelligent production equipment requires and generates more and more data. Fast and reliable communication between all components involved is crucial.

Totally Integrated Automation is based on proven, international, manufacturer-independent communication standards. This facilitates:

- flexible network architectures
- efficient installation
- simple extension
- and easy modernization

Industrial Communication with Totally Integrated Automation stands for robust components as well as powerful, integrated, cost-efficient, and future-oriented network structures.

Industrial Communication with Totally Integrated Automation makes production processes more efficient, more flexible, and more reliable.
The digitization of automation is progressing steadily.

Today Ethernet connections extend all the way to the field level.

Industrial Security with Totally Integrated Automation provides comprehensive protection for:

- Plant security
- Network security
- System integrity
- Integrated security concept

This offers many benefits, while also entailing risks.

The security functionalities are integrated in the automation components.

Integration into the TIA Portal also ensures fast and easy engineering.

This is how you protect your knowledge and ensure the availability of the plant.

- efficient
- reliable
Machines have to be **safe**. But can safety be **economical**?

**Safety Integrated** with Totally Integrated Automation combines **safety** with **productivity**.

Safe, error-free applications in line with the **latest international** standards guarantee **maximum process safety**.

The **safety functionality** is already seamlessly integrated in the automation components.

**Proven protection** of people, machinery, and environment

**Safety-related communication** runs on standard buses and even over Wi-Fi.

And the **seamless integration into the TIA Portal** ensures **efficient** engineering.

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**efficient**

**24/7 reliable**
Integrated Engineering

Significant improvement of the efficiency of engineering projects through the integration of data and information from all subsections involved. The amount of time, money and effort required can be minimized by the resulting parallel execution of processes over the entire life cycle.

TIA Portal

The Totally Integrated Automation Portal (TIA Portal) provides you with full access to the entire digitized automation landscape – from digital workflow, to integrated engineering, all the way to transparent operation. The new version shortens your time to market (for example, via simulation tools), increases your plant’s productivity through additional diagnostic and energy management functions, and offers you more flexibility by connecting you to the management level. The new options benefit system integrators and machine manufacturers as well as plant operators, making the TIA Portal the perfect gateway to automation in the digital enterprise.

Planning efficiency

Planning efficiency simplifies and speeds up the project phases relating to control cabinet planning – achieving time savings of up to 80%.

TIA Selection Tool

The tool helps you to select and configure your plants with all Totally Integrated Automation devices. Using guided selection dialogs, you can quickly and conveniently assemble the components for your overall automation task. This helps you avoid faulty ordering and facilitates the search for the right components. The result can be exported directly to the Industry Mall cart or as a document.
Industrial Data Management

In a modern company, more and more data is generated on a daily basis – which is both a great challenge and a great opportunity. If this data is rendered useable, it’s possible to optimize processes and improve the quality of the product. To achieve this, the most important data within the data flood must be identified, stored over the long term, and made available at all times – including on mobile terminals.

Diagnostics

With Totally Integrated Automation, it is easy to implement efficient diagnostics concepts: Hardware components automatically report errors and supply additional detailed information about the nature of the fault. For engineering this means the diagnostics configuration is easy and user-friendly – requiring no additional programming effort. In this way, any faults can quickly be detected, pinpointed and cleared.

Plant Data Services

How can added value be generated through data? Siemens’ leading role in industrial data technology and its comprehensive industry knowledge make it the ideal partner when it comes to using your machine data to improve availability, efficiency, and performance. Today, Plant Data Services can already provide you with services that will ensure transparency in your industrial processes. Plant Data Services enable you to make sound, fact-based decisions at all times. Production and process data is recorded, filtered, and structured to translate it into real added value, with intelligent analytics of this data playing a key role. In the field of industrial automation and drive technology, Siemens can draw on a unique body of practical experience and the comprehensive industry skills of its global network of experts.

Energy management

Optimized use of resources to strengthen competitiveness.

Energy management plays a significant role in increasing plant productivity, which leads to improved competitiveness. Energy management with SIMATIC makes the flow of energy in production facilities transparent, thus supporting the analysis and identification of potential energy savings. The result is increased efficiency over the long term, higher productivity, and an improved cost situation.
Industrial Communication

Integrated communication based on international, cross-vendor standards that can be flexibly combined.

This unrestricted integration creates the conditions for efficient interaction of all components and the greatest transparency across all levels: the relevant information is available anywhere in the plant at any time.

- More efficient commissioning and more flexible production – possible to intervene in the process from anywhere if necessary
- Diagnostics and maintenance – even wirelessly or via the Internet, thanks to consistent use of international standards
- Simplified expansion and modernization due to high degree of openness and flexibility

Industrial Security

Systematic minimization of the danger of an internal or external attack on plants and networks.

SIMATIC S7-1500/S7-1200

S7-1500 and S7-1200 offer a security concept ranging from authorization levels and component protection, to communication integrity. Security Integrated protects your investment and contributes to greater plant availability.

Security Integrated components

Security Integrated firewall and VPN products for industrial use to minimize risks and improve the standard of security.
Safety Integrated

Reliable protection of personnel, machinery, and environment due to seamless integration of safety technologies into the standard automation. The comprehensive safety portfolio meets all the requirements for functional safety of machines and plants, and enables safe and productive machines to be realized significantly faster, more easily and cost-effectively.

Seamlessly integrated safety technology for smooth plant operation

Totally Integrated Automation makes it possible to implement powerful safety concepts with Safety Integrated – from the controller to peripherals, from HMI to the drives – even on a wireless basis using Industrial Wireless LAN with PROFIsafe.

Easy and reliable way to a compliant solution: standards and guidelines

As your partner in all safety matters, you get more than first-class products and systems. We also provide competent support in complying with the international standards and requirements – by offering training courses, functional examples and certified products.

Safety Evaluation Tool

The Safety Evaluation Tool for the IEC 62061 and ISO 13849-1 standards for safe machinery. When implementing safety functions on machines, our TÜV-approved online tool guides you quickly and safely through the calculation steps. The result: a standards-compliant report that you can integrate as a safety case in your documentation.

Drives with integrated security technology

In terms of functionality and response times, converters with integrated security functions facilitate the implementation of powerful security concepts and are perfectly integrated into TIA Engineering.
Manufacturing Execution System

Manufacturing Execution Systems (MES) – as the link between the production and management levels – ensure greater transparency throughout the plant.

All process information is available in real time throughout the company: As a part of TIA, Manufacturing Execution Systems from Siemens create an efficient interface between production and process automation, on the one hand, and between Enterprise Resource Planning (ERP) and business processes on the other. They are an important basis for more efficient and economical production processes, consistent product quality and faster responses to market demands. With MES solutions from Siemens you can lower your costs on a sustainable basis and achieve a noticeable boost to your competitive capability.
MES Suites

Manufacturing operations on a systematic basis: SIMATIC IT Suites
SIMATIC IT Suites supply you consistently with real-time data, from
process automation to the ERP level. They facilitate the optimization
of production and of research and development, as well as faster
market launches for new products. With SIMATIC IT you are already
opting for a systematic manufacturing operations solution, and the
Intelligence Suite enables an optimum response to all the latest
changes in the market.

Plant Intelligence

Flow of information from machine to management
SIMATIC Plant Intelligence links the SCADA level to the MES level,
thus creating a fully integrated, scalable basis for all plant informa-
tion. Using Plant Intelligence with SIMATIC WinCC, you can generate
relevant real-time information at plant level. The system can be
expanded seamlessly to create a comprehensive optimization solu-
tion at MES level at any time.

MES components

Maximum production performance with SIMATIC IT components
MES components from Siemens offer an impressively wide range of
functions and ensure maximum efficiency and transparency through-
out the entire production process. SIMATIC IT has a modular and
scalable structure. If the demands change, your system can easily be
adapted to suit them at any time and at a reasonable cost.
SIMATIC SCADA Systems

Efficient, scalable, innovative and open.

Siemens SCADA systems are scalable over the entire life cycle, so that existing plants can be expanded at any time. This means security of investment. Regardless of whether you have a single-user, multi-user or even a widely distributed system, Siemens SCADA systems enable you to visualize machines, production lines and entire plants, thereby ensuring greater transparency. You are in a position to identify potential for optimization, minimize downtimes and ensure a short time-to-market.

Within the context of TIA, the scalable and flexible SIMATIC SCADA Systems combine efficient engineering with powerful archiving features and maximum data security. This permits efficient plant management and intelligent production analyses. Innovative technology for both stationary and mobile solutions and the support of international standards ensure the universal applicability of the powerful and versatile SIMATIC SCADA Systems in almost any industrial sector.
SCADA System SIMATIC WinCC V7

SIMATIC WinCC is an innovative, scalable process visualization system with numerous high-performance functions designed to monitor automation processes. Whether you have a single-user or distributed multi-user system with redundant servers: The system offers full SCADA functionality for all industries and is characterized by maximum openness.

SCADA System SIMATIC WinCC Open Architecture

SIMATIC WinCC Open Architecture is a SCADA system for visualizing and operating processes, production flows, machines and plants in all industrial sectors. Distributed systems enable the connection of up to 2,048 autonomous SIMATIC WinCC Open Architecture systems via a single network. Each subsystem can be configured either as a single-user or multi-user system. SIMATIC WinCC Open Architecture relies throughout on object orientation in the case of process screens and the database structure.

SCADA System WinCC Professional

SIMATIC WinCC Professional is a PC-based HMI system for the visualization and operator control of processes, production flows, machines, and plants in all sectors – from the simple single-user station to multi-user systems and cross-location solutions with Web clients.

SCADA system and SIMATIC IPC

Together, SIMATIC WinCC and SIMATIC industrial PCs form a platform for recording, evaluating, and visualizing data. The coordinated development and integrated functionality of hardware and software result in numerous benefits throughout the entire life cycle.
Energy Management

High energy consumption and automated production are typical of many industries.

If you want to bring your energy costs under control over the long term and are already anticipating a digital future, equip your plants with integrated power monitoring technology, thereby embedding your energy management in the automation of your production – right where the most energy is consumed.

As an integrated option for the TIA Portal, SIMATIC Energy Suite efficiently links energy management with automation, thereby bringing energy transparency to your production. Furthermore, the simplified planning of power monitoring components significantly reduces configuration outlay.

Thanks to the end-to-end connection to SIMATIC Energy Manager PRO* or the cloud-based Service Energy Analytics, you can seamlessly expand your recorded energy data to form a multisite energy management system and thus create the basis for sustainable business as per ISO 50001 and cover all aspects of energy management: reporting, purchasing, monitoring (EnPI), planning.

* SIMATIC Energy Manager PRO is the planned, completely innovated successor to SIMATIC B.Data
Energy Meter for SIMATIC ET 200SP and SIMATIC S7-1200

Create energy transparency through integrated automation using the Energy Meter compact energy measurement module. Energy Meter permits the cost-effective, precise, simple, and scalable measurement of all types of media and provides the basis for the efficient operation of your production and machinery.

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Products in the SENTRON, SIMATIC, SIMOCODE, SINAMICS, and SIRIUS families. For information on devices currently supported, visit:

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SIMATIC powerrate

SIMATIC powerrate for the SCADA System SIMATIC WinCC V7.x and STEP 7 V5.5 records, visualizes, and archives all of a plant’s energy-related consumption data. This enables energy-saving potential to be tracked down and energy costs reduced.

SIMATIC B.Data

With B.Data, Siemens offers you a unique, comprehensive and state-of-the-art solution concept, proven in practice, for optimized and economical energy management. The secret of success is in the exact, automatic data recording and preparation, as well as complete energy accounting of the systems or units that generate or consume energy.
Totally Integrated Automation Portal

The TIA Portal provides you with an integrated engineering framework of the next generation that gives you the best possible support when optimizing all planning, machine and process sequences.

The TIA Portal offers a standardized and consistent operating concept. It integrates controllers, distributed I/O, HMI, power supply and distribution, drives, network components, motion control and motor management seamlessly in a single engineering environment. With shared data storage – the smart library concept – universal hardware and software functions efficiently perform all your automation tasks.

You benefit from shorter engineering times, complete protection for all your investments in human resources, machinery and the environment, as well as low maintenance costs and rapid plant expansion. This results in the greatest possible plant availability, thereby safeguarding your competitive edge.
TIA Portal

Concentrate on the engineering, not on learning how to use software – right from the start! The TIA Portal is consistently designed in such a way that you can work intuitively and goal-oriented from the very first moment. The clear task and user orientation, a uniform look-and-feel, advanced software architecture with easy navigation and the graphical network and device configuration ensure efficient working and error-free results.

Controller software in TIA Portal

Modern automation solutions have to meet numerous challenges. This calls for high-performance software that is as efficient, flexible and secure as possible – and will remain so. By choosing the license most suitable for your individual application, you keep your software up-to-date in a cost-efficient manner.

HMI software in TIA Portal

SIMATIC WinCC in the TIA Portal is the software for integrated, efficient and intuitive HMI solutions specifically at the machine level – from the simplest operating solutions with Basic Panels to PC-based multi-user systems.

Motor management software in TIA Portal

SIMOCODE pro – the flexible and modular motor management system for low-voltage motors – helps guard against faults in the plant and consequently avoids expensive downtimes. Simple planning, highly reliable configuration, fast commissioning, as well as parameterization, diagnostics and maintenance-relevant monitoring functions: these are the features of user-friendly engineering with SIMOCODE ES, the central software for configuring, commissioning, operation and diagnostics of SIMOCODE pro devices. Integrated into the standardized Totally Integrated Automation Portal (TIA Portal) engineering framework, SIMOCODE ES efficiently and intuitively executes all your automation tasks.

SIMATIC Field PG M5

This rugged and ready-to-run programming tool in notebook format sets the standard in compactness, robustness and speed for mobile engineering in the industrial environment. Fully pre-installed with SIMATIC STEP 7, WinCC, and TIA Portal engineering software, with an option for STEP 5.
TIA Portal

With the Totally Integrated Automation Portal (TIA Portal), Siemens is pursuing its vision of offering an engineering framework that enables you to implement automation solutions in any industry, anywhere in the world. The TIA Portal provides you with complete access to all digitized automation. From digital workflow, to integrated engineering, all the way to transparent operation, the TIA Portal reduces engineering time, costs, and effort.

SIMATIC STEP 7

Intuitive and efficient engineering – from the microcontroller to the PC-based controller – standard and safety engineering in one system. Check and test your applications prior to commissioning (for SIMATIC S7-1500, SIMATIC S7-1200, SIMATIC S7-300, SIMATIC S7-400, SIMATIC ET 200 CPUs, SIMATIC S7-1500 software controllers and SIMATIC WinAC).

Drives software in TIA Portal

The SINAMICS Startdrive commissioning software is part of the TIA Portal which permits the easy and intuitive integration of SINAMICS drives into the automation engineering. Since SINAMICS Startdrive has an identical operating concept to the other parts of the TIA Portal, SINAMICS converters can be integrated into automation solutions and put into service quickly, easily and conveniently.
SIMATIC WinCC
SIMATIC WinCC (TIA Portal) covers all applications at the machine level. The software offers fully integrated and scalable configuration tools that are efficient to use.
SIMATIC WinCC (TIA Portal) offers genuine added value due to:
• Efficient engineering – with minimal effort, the visualization can be generated faster and more easily than ever before:
  Shared data storage and the intelligent graphics editor avoid redundant multiple inputs and prevent errors. The library concept and the easy replacement of devices reduce the engineering effort to a minimum.
• Innovation in design and operation – as the best advertisement for the automation solution, and for a unique flexibility that pays for itself, SIMATIC HMI offers styles and designs that enable an individual response to customer requirements. Intuitive multi-touch and gesture operation offer excellent usability.

SIMOCODE ES
SIMOCODE ES is the centralized software for configuring, commissioning, operation and diagnostics of SIMOCODE pro motor management devices. Integrated into the standardized Totally Integrated Automation Portal (TIA Portal) engineering framework, SIMOCODE ES efficiently and intuitively executes all your automation tasks.
It facilitates:
• Standardized, centralized and innovative engineering
• Graphical parameterization and commissioning of the switching system thanks to an integrated graphics editor
• Straightforward maintenance and diagnostics
• For all SIMOCODE pro devices
Siemens offers the right controller for a wide range of automation requirements. The SIMATIC range of controllers comprises Basic, Advanced, Distributed, and Software Controllers offering impressive scalability and integration of their functions. The engineering in the Totally Integrated Automation Portal (TIA Portal) enables optimal automation solutions to be developed for every application. SIMATIC Controller are key elements of TIA and prove themselves in daily use in plant and machine construction, as well as in production and process engineering. The integration of all current SIMATIC Controller in the TIA Portal creates a completely new dimension of efficiency in the engineering of automation solutions and sets new standards in terms of communication and diagnostics. Whether they are used for standard, fail-safe, or motion control solutions, SIMATIC Controller are a sound investment in the future, with which you can respond to new challenges with speed, flexibility and efficiency.

SIMATIC Controller – the intelligent choice for your automation task
Control – Controller

**Basic Controller**

Basic Controllers are the intelligent choice for compact automation solutions with integrated communication and technology functions. They are available in standard and safety versions. Basic Controllers are configured and programmed in the Totally Integrated Automation Portal (TIA Portal). That means that you benefit from maximum engineering efficiency. And, if required, migrating applications with increased complexity to Advanced Controllers, is also very easy.

**Advanced Controller**

The highlight is the SIMATIC S7-1500: together with the TIA Portal, this controller combines power and efficiency for medium to sophisticated applications with high demands in terms of communication, flexibility and networkability. The S7-1500 ensures high system performance and user-friendliness. Thanks to its combination of standard, fail-safe, and motion control solutions in a single controller, it is a sound investment in the future. In addition to the current SIMATIC S7-1500 standard controller, the SIMATIC S7-300 and SIMATIC S7-400 also belong to this family of Advanced Controllers.

**Distributed Controller**

The SIMATIC ET 200 CPU Distributed Controller combine a compact design with versatility. The perfect solution in the mid-performance range for machines with distributed intelligence or series machines with little available space. In addition to the SIMATIC ET 200SP CPUs and the new SIMATIC ET 200SP open controller (which also comes in a fail-safe version), the tried and tested controllers are also available for SIMATIC ET 200S and ET 200pro systems.

**Software Controller**

The SIMATIC S7-1500 Software Controller makes the advantages of the standard SIMATIC S7-1500 controller available on high-performance industrial PCs and now also comes in a fail-safe variant. This means you benefit from the greatest possible user-friendliness and increased availability of the controller due to the independence of Windows. For efficient engineering, be sure to use the Totally Integrated Automation Portal (TIA Portal).

**Logic module**

LOGO! is the perfect choice as a fast, uncomplicated and space-saving solution for analog value applications and basic control tasks. With eight basic logic functions and 35 special functions it replaces a host of conventional switching and control devices and offers comprehensive Ethernet communication options.
**SIMATIC S7-1200**
SIMATIC S7-1200 Basic Controller are the ideal choice for compact automation solutions with integrated communication and technology functions in the low- to mid-performance ranges. They can now also be used in fail-safe applications. These compact devices are characterized by minimum space requirements and extensive communication options via integrated interfaces and communication modules, e.g. for telecontrol. They also feature integrated technology functions for measuring and counting, which means that no other special modules are required.

**SIMATIC S7-1500**
The flagship of the Advanced Controller is the SIMATIC S7-1500. It is the current standard for the entire factory automation, including complex safety-oriented and sophisticated motion control applications. Thanks to its unrestricted scalability, SIMATIC S7-1500 is the perfect controller solution for automating everything from an individual machine to an entire plant. Communication modules increase the flexibility and performance of automation solutions with SIMATIC S7-1500. In this way, complex automation structures can be set up via additional interfaces or optimized via the connection to the corporate management level processes. By means of seamless integration into the TIA Portal, you can get the most from your system and are best equipped to cope with the growing rate of change in the market, ever shorter product life cycles and the increasing pressure of competition and costs.

**SIMATIC S7-300**
SIMATIC S7-300 facilitates space-saving and modular assembly. The wide range of modules can be used for central expansions or for the assembly of distributed structures in a task-specific manner and allows the low-cost storage of spare parts. Numerous innovations make the SIMATIC S7-300 an integrated system that saves you additional investment and maintenance costs.
**SIMATIC S7-400**

High-end automation for all industries. These automation systems are used wherever performance is the top priority in automation. Thanks to its high scalability, this series offers various safety and availability levels, thereby addressing all of the relevant industrial domains. Fault-tolerant S7-400H systems are your insurance against costly plant downtimes. Controller performance is optimally scalable. From a favorably priced entry-level solution for smaller plants up to large networked systems with an almost unlimited I/O capacity. These controllers also allow plants to be expanded and modules to be replaced while your production system is operational. Consequently, the SIMATIC S7-400 Series addresses the upper performance range for all industries, thus continuing to offer plant operators and builders long-term investment security.

**SIMATIC ET 200SP CPU**

SIMATIC ET 200SP is the new generation of distributed I/O. Interface modules with integrated CPU and PROFINET connections are available for SIMATIC ET 200SP. The functionality of the CPUs corresponds to that of the S7-1500. Various connection technologies can be implemented with the three integrated Ethernet ports. Thanks to the I-device functionality, connection to a higher-level CPU can be made in exactly the same way as with a standard interface module. The fail-safe ET 200SP CPUs permit the processing of both standard and safety programs.

**SIMATIC ET 200SP Open Controller**

As the first controller of this type, the SIMATIC ET 200SP Open Controller combines the functions of a PC-based software controller with visualization, PC applications and central I/O (inputs/outputs) in one compact device. Available in standard or fail-safe versions.

**SIMATIC ET 200S CPU**

The SIMATIC ET 200S is the multifunctional, highly modular I/O system with IP20 degree of protection that can be exactly tailored to your automation task. Interface modules are available in both standard and fail-safe versions offering CPU functionality for connection to PROFINET or PROFIBUS.

**SIMATIC ET 200pro**

The SIMATIC ET 200pro is a particularly small, very rugged and powerful I/O system with IP65/67 degree of protection. Interface modules are available in both standard and fail-safe versions offering CPU functionality for connection to PROFINET or PROFIBUS. With the new ET 200pro CPU based on S7-1500, all the advantages of the S7-1500 are available directly in IP67.
SIMATIC S7-400
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SIMATIC ET 200pro
The SIMATIC ET 200pro is a particularly small, very rugged and powerful I/O system with IP65/67 degree of protection. Interface modules are available in both standard and fail-safe versions offering CPU functionality for connection to PROFINET or PROFIBUS. With the new ET 200pro CPU based on S7-1500, all the advantages of the S7-1500 are available directly in IP67.

SIMATIC S7-1500 Software Controller
The S7-1500 Software Controller based on the SIMATIC S7-1500 for PC-based automation with SIMATIC Industrial PCs is operated independently of Windows, thus offering a high level of system availability: This is advantageous for fast controller ramp-up and makes it possible to carry out Windows updates and rebooting while the control system is running. Thanks to the straightforward integration of PC applications and high-level languages (C/C++), this controller is particularly suitable for series machine builders. The programs and engineering handling for the new software controller are fully compatible with the standard SIMATIC S7-1500 controllers. The controller not only offers protection of know-how and protection against unauthorized access, but also important automation functions, e.g. for positioning axes, and interfaces to PROFIBUS and PROFINET.

LOGO!
LOGO! 8 is the first of a new generation of successful Siemens logic modules. This new module accommodates virtually all customer demands with simplified handling, a large display, and full communication options via Ethernet. It also makes the web server application extremely easy to use, as no HTML programming knowledge is necessary. The CMR2020/2040 communication module permits remote communication via SMS and position recognition via GPS. The CMK2000 communication module is available for integrating LOGO! 8 into building automation applications.
SIPLUS extreme
Enhanced standard modules based on SIMATIC for extreme conditions:

- Ambient operating temperature range from –20°C to +50°C
- Condensation, increased humidity, increased degree of protection (dust, water)
- Exposure to extreme surroundings, e.g. toxic atmosphere
- Increased mechanical loading
- Voltage ranges which deviate from the standard

The products:
- Railway application Railway and Rolling Stock
- SIPLUS S7-1200
- SIPLUS S7-1500
- SIPLUS S7-400
- SIPLUS S7-300
- SIPLUS LOGO!
SIMATIC HMI – a new dimension of efficiency

SIMATIC HMI panels are equipped with numerous functions and versatile connection options and are available in many different performance classes. From simple keypad panels, via mobile and stationary control operator devices, right up to powerful multi-purpose devices for demanding applications, the rugged and compact SIMATIC HMI panels permit efficient machine-level operator control and monitoring of processes. Brilliant display screens and ergonomic design ensure reliable operation by means of keypads or touch screens.

All the latest HMI operator devices are integrated into the TIA Portal. This makes the engineering for all HMI applications – from the simplest operating solutions with Basic Panels to PC-based multi-user systems – particularly easy and uniquely efficient.
Operator devices

The high-luminance SIMATIC HMI operator displays are the perfect standard for all panel-based HMI solutions in all industrial sectors. The devices can be commissioned at lightning speed and enable migration to a new generation without any glitches. They feature rugged industrial quality and are maintenance-free, while also offering best readability and unique flexibility in design and operation.

Panel PC systems and monitors

Computers in various performance classes, a wide selection of panel fronts, monitors with industry-compatible designs and complete systems assembled from optimally coordinated hardware and software: the comprehensive range of SIMATIC panel systems and monitors offers a powerful and rugged PC-based visualization solution for every application.

Customized Automation

Customer-specific products based on the SIMATIC standard – familiar class-leading quality and functionality, but adapted to special requirements.

HMI software

From configuration software and software for visualization at machine level, to high-performance SCADA systems with plant intelligence: the SIMATIC WinCC in the TIA Portal, SIMATIC WinCC V7 and SIMATIC WinCC Open Architecture families of products cover all requirements for engineering and visualization software for the human-machine interface and permit optimum efficiency through flexibility, transparency and openness.
**HMI Key Panels**
Innovative operator panels for use in PROFINET networks.
For further information, visit: www.siemens.com/key-panels

**HMI Comfort Panels**
Enhanced standard modules based on SIMATIC HMI for extreme conditions.
For further information, visit: www.siemens.com/comfort-panels

**HMI Basic Panels**
Low-cost, entry level series for basic HMI applications.
For further information, visit: www.siemens.com/basic-panels

**HMI Mobile Panels**
Portable operator devices for flexible operator control and monitoring.
For further information, visit: www.siemens.com/mobile-panels

**SIPLUS extreme**
Enhanced standard modules based on SIMATIC HMI for extreme conditions:
- SIPLUS Comfort Line: High-end operator devices for demanding HMI tasks
- SIPLUS Basic Line: Simple visualization tasks with greater exposure to media
- SIPLUS Multi Panels: Demanding HMI tasks in harsh industrial environments
For further information, visit: www.siemens.com/siplus-extreme

**HMI Outdoor Panels**
For demanding outdoor HMI applications under extreme ambient conditions:
- Flexible outdoor use thanks to extremely robust design
- Safe operation and monitoring in extreme lighting conditions
- Applications in any industry thanks to comprehensive certifications
For further information, visit: www.siemens.com/comfort-outdoor
Totally Integrated Automation at a glance!

No downtime – production up by 150%

Canyon Rock on Totally Integrated Automation.
Complex control tasks, industrial data server or the integration of demanding software applications – SIMATIC industrial PCs offer an open platform to realize these tasks efficiently and reliably.

With SIMATIC IPCs you are putting quality first. The industrial PCs are designed for reliable 24/7 operations in rugged industrial environments. SIMATIC IPCs are available with different functionalities and in the following designs: Rack PC, Box PC, and Panel PC. You can order more than 90 million configurations to get the right product precisely tailored to your specific requirements. All share a great focus on reliability and longevity.

**SIMATIC IPC and the SCADA system**

Together, SIMATIC industrial PCs and the SCADA system form a platform for recording, evaluating, and visualizing data. The coordinated development and integrated functionality of hardware and software result in numerous benefits throughout the entire life cycle.
Rack PC

The SIMATIC rack PC family includes flexible industrial PCs in 19” design for applications with high performance requirements. Rack PCs from Siemens have all the features you would expect from an industrial PC: innovative technology with powerful Intel processors, high system availability, ruggedness and expandability, and long-term reliability.

Box PC

Rugged, reliable, compact, universal and scalable with regard to performance – these are the main characteristics of the powerful SIMATIC Box PC range from Siemens. Small footprint, flexible installation options and exceptional ease of servicing facilitate universal mounting in machines, control racks and control cabinets.

Panel PC

The SIMATIC Panel PC portfolio is ideally suited for direct machine or plant visualization tasks. All-in-one Panel PC devices integrate an industrial PC and an operating unit, and then offer a winning combination of ruggedness, performance and brilliant display. Equipped with the latest multitouch technology, they meet a wide range of manufacturing and process automation requirements.

Industrial monitors and Thin Clients

Siemens offers you reliable and extremely robust Flat Panels and Thin Clients that are far more than just simple industrial monitors. They can be used in applications where operator panels have to be installed separately at different distances from the computer for technical or economic reasons – as a single solution, or with multiple operating terminals for visualization and control solutions spread over wide areas.

Customized Automation

In the context of SIMATIC Customized Automation Siemens offers you products that are perfectly tailored to your individual requirements. For this, we adapt our tried-and-tested standard products with the modifications necessary to satisfy your requirements: from minor design changes right through OEM hardware and software systems.

HMI devices for special requirements

Devices with stainless steel fronts for the food and beverages industries, devices with rugged aluminum enclosures with IP65 protection for particularly harsh outdoor ambient conditions or intrinsically safe HMI devices for hazardous areas.
Nano PC IPC2x7
The Nanobox und Panel PC with optimized performance in a compact design – maintenance-free and rugged with displays from 7”.
For more information, visit:
www.siemens.com/ipc227E

Embedded IPC4x7
High performance – zero maintenance – flexible configuration
For more information, visit:
www.siemens.com/microbox

High-end IPC6x7 and IPC8x7
High system availability and expandability for demanding applications.
For more information, visit:
www.siemens.com/ipc

IPC547 and IPC347
High performance, attractive price
For more information, visit:
www.siemens.com/ipc547e
www.siemens.com/ipc347e

Industrial Flat Panel
Industrial monitors for practical gesture and multitouch operation.

Industrial Thin Client Widescreen
Widescreen terminal devices for industrial applications.
Innovative assembly workstation with high-end IPC

Powerful and open to new ideas.
Maximum integration for maximum flexibility

Industrial Communication is essential for every functioning automation system. It provides the infrastructure and the necessary network mechanisms for a company-wide exchange of data. This means: along the entire value-added chain, from field to management level – regardless of whether cabled or wireless. Against this background it becomes clear why efficient industrial networks can only be implemented on the basis of communication standards that guarantee a high degree of openness and flexibility.
Industrial Remote Communication

Modern industrial plants are often distributed over large areas – sometimes even across national borders. That is why remote access from anywhere in the world to distant plants and machines, as well as mobile applications, is becoming more important all the time. Telecontrol and teleservice from Siemens are proven solutions that address this growing demand. They permit secure and reliable remote access over public and private infrastructures in the manufacturing and processing industries.

Industrial Ethernet

The IEEE 802.3 international standard for area networking is the number one network in the LAN environment. Siemens offers everything you need to implement extremely efficient industrial networks and bus systems: powerful, future-proof network components and software for reliable use even in harsh industrial environments, a cabling system for fast assembly on-site, high-speed redundancy for enhanced availability, and a signaling concept for constant monitoring of the network components.

PROFINET

PROFINET is the leading Ethernet standard for automation. The open PROFINET standard offers crucial advantages: Maximum flexibility ensuring greater freedom for customized machines and plant concepts. Maximum efficiency for the optimum utilization of all available resources. And the unique performance of the Industrial Ethernet standard for high precision and product quality.

Industrial Wireless Communication

Whether transmitting data over long distances, precisely controlling cranes or automatic guided vehicle systems, or implementing reliable telecontrol and remote maintenance: wireless communication offers multiple new opportunities for the development of highly flexible and efficient industrial automation solutions. Siemens products for Industrial Wireless Communication via remote networks, Industrial Wireless LAN, WirelessHART or WiMAX are reliable, robust and secure.
PROFIBUS

With more than 50 million installed nodes, PROFIBUS is the leading fieldbus on the global market. It’s no coincidence that the growth curve is still rising steeply. The benefits of this universal fieldbus system for industrial automation are valued in all industries: based on a modular principle, it can be adapted to the most varied applications and shows its strengths in all segments of factory automation and in the process industry. Siemens offers a comprehensive range of products and systems for this purpose.

AS-Interface

AS-Interface (AS-i), developed as a multivendor alternative to conventional parallel cabling of sensors and actuators, is an effective, powerful bus system that securely connects all sensors and actuators at the lowest field level to the higher-level controller with unrivaled simplicity. AS-Interface is a cost-effective feeder for PROFIBUS and PROFINET, easy to engineer and standardized in accordance with EN 50295 and IEC 62026-2. All Siemens components comply with this specification and have been correspondingly tested and certified.

IO-Link

The IO-Link communication standard is ideal for the intelligent connection of sensors and controls to the control level. IO-Link in the control cabinet and IO-Link at the field level greatly simplify the integration of all components. The result: maximum integration and efficiency down to the last few feet to the process, for precise and efficient production processes.
Compact Switch Modules CSM
More connections to SIMATIC
Interface expansion directly at the SIMATIC designed for integrating machines into existing plant networks.

SCALANCE X-000 unmanaged
Implement a simple machine network at low cost: SCALANCE X-000 compact unmanaged Industrial Ethernet switches are the space-saving, entry-level solution for setting up small Industrial Ethernet topologies. 24 V AC variants are also available for use in building automation.

SCALANCE X-100 unmanaged
For a reliable network solution with all equipment details
Low-cost industrial quality: The rugged SCALANCE X-100 unmanaged Industrial Ethernet switches with various port configurations reduce your installation costs and enable the right choice for each application. With these switches, you also save on installation costs thanks to their integrated Power-over-Ethernet functionality: Data and energy are transferred via one line. Also available as media converter and optical bypass relay.

SCALANCE X-200 managed
These all-purpose switches are ideally suitable for setting up line, star, and ring topologies (10/100 Mbit/s). They offer high-speed redundancy in the ring for electrical or optical lines and, if faults occur, can easily be replaced thanks to the C-PLUG exchangeable medium.
Their compact design is available with different port characteristics from device variants with up to 24 electrical ports and optical ports (BFOC/ST and SC) for distances up to 26 km.
Variants are available for line diagnostics of optical switch ports and for seamless redundant network structures with PRP and HSR redundancy protocols. Variants in the SIMATIC design for space-saving control cabinet configuration complete the range.

SCALANCE X-200IRT
Operating in hard real time
Compact switches with IP30/IP65 protection, specially for hard real-time requirements (isochronous real time), for example in high-performance, isochronous Motion Control applications. Redundant ring topologies can be established via these switches for simple redundancy with the Media Redundancy Protocol (MRP) or seamless redundancy with Media Redundancy with Planned Duplication (MRPD).

SCALANCE X-300 managed
Convincing performance – modular and powerful
High degree of functionality and flexibility: available as 19" rack versions for equipping or in compact form, these powerful devices expand your plant networks with Gigabit Ethernet, even under extreme conditions.
SCALANCE X-400 managed / Layer 3
Segmentation at all levels
Expandable at any time – thanks to the new modular structure, this product line offers maximum flexibility in the automation network – and higher performance (1000 Mbit/s), while taking up little space. The pluggable transceivers with various connectors (for SC, ST/BFOC, and LC connection technology) offer you maximum flexibility in your automation network. With the help of the KEY-PLUG XM-400 exchangeable medium, Layer 3 functions can also be optionally activated, thus further improving performance.

SCALANCE X-500 managed / Layer 3
Construct high-performance plant networks with industry-specific functions and typical IT communication standards.
Structure your plant network with SCALANCE X-500 19" rack switches as central components. Thanks to full modularity, these devices offer complete freedom for your choice of connecting media, transmission rates of up to 10 Gbit/s and a variety of redundancy concepts. Provide for a seamless transition between corporate and production networks and for the structuring of your industrial backbone.

Network security
For industrial use, Siemens offers an extensive range of products with integrated security functions (Security Integrated), such as SCALANCE S security appliances, SCALANCE M Internet and mobile wireless routers, Security S7 and PC communications processors, as well as the SOFTNET Security Client. These protect automation networks against unauthorized access and also safeguard global access to remote plants and systems.

SINEMA Server
The SINEMA Server software has been specially developed for industrial applications. Using SNMP for all classic network components and by evaluating SIMATIC and PROFINET modules in the automation environment, complete networks can be analyzed and monitored. Captured data is stored in a long-term memory and can thus be evaluated as required and presented in the form of reports.
**Cabling technology**

On-site assembly – quick and easy, error-free

With the FastConnect installation system, structured cabling becomes industry-compatible for installation in the production hall. This system of cables, connectors and assembly tools is available for Industrial Ethernet / PROFINET and PROFIBUS, and for RJ45, M12 or sub-D/RS 485; as well as for fiber-optic cables: ST / BFOC, SC, SC RJ and LC in various lengths – pre-assembled or by the meter for on-site assembly with matching termination kits.

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**Control – Communication – Industrial Wireless Communication**

**Connection of PROFIBUS to IE/PB LINK PN IO and SCALANCE W722-1 RJ45**

The integration of PROFIBUS field devices into an IWLAN puts an end to worn sliding contacts. It substitutes solutions with a power rail booster for PROFIBUS and permits cross-network PG/OP communication by means of S7 routing.

**SCALANCE W**

Installation of a plant-wide wireless network with Industrial Wireless LAN components in accordance with IEEE 802.11a/b/g/n

- The access points and client modules of the SCALANCE W-700 product lines are ideally suited for setting up Industrial Wireless LANs (IWLAN) for 2.4 GHz or 5 GHz. They can be used in all applications that require a high degree of operational reliability, even in extremely harsh surroundings and when functional safety is required (PROFsafe). Even demanding applications with real-time and redundancy requirements are possible on a wireless basis.
  - Gross bandwidth of up to 450 Mbit/s
  - Communication across radio cells
  - SCALANCE W-700 devices are suitable for any application: for outdoor areas with higher climatic demands (up to IP65), and for indoor, cabinet-free setups, for installation in the control cabinet and for extended ambient conditions
  - Central management of SCALANCE W controller-based access points is possible in combination with the SCALANCE WLC711
  - One solution for all: comprehensive, coordinated portfolio of antennas for different radio field architectures
  - RCoax radiating cables for reliable radio connection along defined sections, e.g. rails or elevators
Telecontrol solutions for the control center

Different solutions are available for the control center depending on the scale and requirements of the applications:

**TeleControl Basic**
TeleControl Basic is a telecontrol system for simple control tasks and is based on the TeleControl Basic transmission protocol. It supports a huge number of substations via mobile wireless and Internet.

**TeleControl Professional**
The TeleControl Professional system is suitable for large-scale telecontrol solutions with complex control tasks. The system supports numerous telecontrol protocols, network topologies, and communication media, which makes it suitable for linking substations via all available communication media (private and public networks, mobile wireless, Internet).

The telecontrol solutions for control centers can be used independently or combined.

Remote terminal units (RTUs) for all applications
Remote terminal units (RTUs) are located at the substations of telecontrol plants and monitor widely dispersed measurement points. Different RTUs are used, depending on the complexity of the task. With the comprehensive offering of modular RTUs based on SIMATIC controllers, you can flexibly adapt your substations to your requirements. For the connection of modular RTUs, we offer communication modules in the form of communication processors (CPs) and Telecontrol Interface Modules (TIMs). Our portfolio also includes a compact RTU that operates completely autonomously in harsh environments.

Teleservice
Teleservice can be used to diagnose and maintain machines and systems over telephone networks, mobile radio or the Internet, from any location in the world. Siemens offers a complete range of products for the safe and reliable design of the data transmission. This significantly reduces the need for on-site service visits – by up to 60%.

Remote Networks
Whether dedicated line, public switched or mobile telephone network, or Internet – Siemens offers a complete portfolio of application-neutral transmission and security components for remote networks to provide wireless or wire-bound communication for telecontrol, teleservice and other remote communication applications. For the construction of IP-based networks, the Ethernet components of the SCALANCE X/W family can be used. To achieve a high level of process availability, the transmission networks can be designed as a redundant configuration. In addition to modems and routers for IP-based networks (SCALANCE M-800), a management platform for remote networks is also available: The SINEMA Remote Connect server application provides easy remote access to machines and plants for the purpose of remote maintenance.
**SIPLUS extreme for Industrial Communication**
Enhanced standard modules based on SINAUT for extreme ambient conditions.
SIPLUS industrial switches distribute data in a targeted and reliable manner within the industrial network under extreme temperature conditions. The enhanced communication processors of the SIPLUS NET range are particularly suitable for applications in the field of manufacturing and process automation.
For further information, visit: www.siemens.com/siplus-extreme

**PROFINET / PROFIBUS**

**PROFINET**
PROFINET, the open Industrial Ethernet standard, stands for flexibility, efficiency, and high performance in Industrial Communication. The technology is capable of meeting the constantly rising demands in automation both reliably and sustainably.
PROFINET proves itself in an enormous range of applications worldwide every day. The wide variety of devices with a PROFINET connection ensures that there is a solution for almost every application and industry.

**PROFIBUS**
Communications processors with multi-protocol capability support the flexible expansion of SIMATIC with further communication interfaces for PROFIBUS as required, thereby relieving the CPU of the control task.
Based on a modular principle, the globally proven PROFIBUS fieldbus system can be adapted to a huge variety of applications and shows its strengths in all segments of factory automation and in the process industry. The globally field-proven PROFIBUS can be used in all sub-steps of production processes and across all process steps. Integrated solutions help to significantly reduce investment, operating and maintenance costs, and to decisively increase plant availability and productivity.
Control – Communication – **AS-Interface**

**Master for SIMATIC**
AS-Interface networks can be connected directly to the SIMATIC controller or distributed I/O in a very convenient manner. CPs or CMs are available for this purpose, making integration just as easy as with other SIMATIC expansion modules from Siemens.

**Slaves**
As many as 62 standard slaves or 31 safety slaves can be connected to an AS-i network. These slaves then exchange their data with the higher-level AS-i Master. The range of our AS-i slaves extends from simple I/O modules to motor starters and frequency converters.

**Network transitions / links**
In addition to direct integration, AS-Interface can also be used on a distributed basis as a feeder for higher-level bus systems. With the aid of AS-i network transitions (links), subordinate AS-i networks can be completely assembled and put into service even before the central controller has been fully programmed.

**Power supply units and data decoupling**
The power supply units provide the AS-i network and the connected slaves with energy from a central location. They are an integral component of an AS-i network and, in connection with the data decoupling, they permit the simultaneous transmission of data and energy on the same two-wire cable.

**ASIsafe**
Depending on requirements, you have a choice between the “small” ASIsafe Solution Local and the cross-cell, plant-wide ASIsafe Integration with the aid of the SIMATIC AS-i F-Links, as a transition from ASIsafe to PROFIsafe under a fail-safe controller.
Control – Communication – IO-Link

Master modules
• SIMATIC ET 200eco PN
• SIMATIC ET 200AL
• SIMATIC S7-1200
• SIMATIC ET 200S
• SIMATIC ET 200SP

Controls
• SIRIUS 3RA6 compact starters with IO-Link
• SIRIUS 3RA27 function modules for mounting on SIRIUS 3RT2 contactors for switching motors
• SIRIUS 3RR24 and 3UG48 monitoring relays
• SIRIUS 3RS14/15 temperature monitoring relays
• SIRIUS 3RB24 solid-state overload relays

RFID system
• SIMATIC RF200

I/O modules
• IO-Link module K20 4DI
• IO-Link module K20 8DI

Software
• SIMATIC S7-PCT (Port Configurator Tool)
Library with Siemens device-specific function blocks
• IOL_DEVICE function block
• IOL_MASTER function block
Motion Control solutions that pay off

Motion Control solutions are required to satisfy an increasingly diverse and complex range of demands. The TIA concept has been devised to make all processes – from the initial planning stage through development of the Motion Control concept to final implementation of an optimum solution – efficient and systematic so as to ensure the highest possible level of flexibility, speed and precision. The scalable products, innovative systems and standardized solutions available from Siemens, supported by their extensive global service offering, are the bedrock for Motion Control systems and solutions that deliver optimum performance over their entire lifetime.
SIMOTION Motion Control system

Sophisticated, reliable and efficient machine control. The scalable, modular, high-performance SIMOTION Motion Control system for reliable control of machine motion: in central or distributed machine configurations or in PC-based, controller-based or drive-based solutions. Whatever your application, you will benefit from outstanding flexibility, user-friendly engineering and rapid commissioning.

SIMATIC Technology

For counting, measuring, cam control, closed-loop control or motion control: the painstakingly engineered SIMATIC Technology system solution offers user-friendly, integrated engineering as well as rapid commissioning and freedom of selection of the system design for infinitely flexible combinations of many different technological tasks.

SINAMICS converter family

With SINAMICS, Siemens offers you a platform that optimally meets the elevated requirements in the low-voltage, medium-voltage, and DC-voltage ranges. This complete and integrated drive family addresses all of the performance levels and is characterized by an extremely high degree of flexibility, functionality, and efficiency. With its consistent engineering, ease of integration into the automation environment, comprehensive safety functions and user-friendly operation, the extensive portfolio of drives developed by Siemens simply gives a stunning performance.
SIMOTION D
Drive-based
All functions associated with motion control, technology and PLC are directly integrated in the drive.
- SIMOTION D410-2 single-axis system with multiple-axis option (Blocksize)
- SIMOTION D4x5-2 multiple-axis system in four performance variants for up to 128 axes (Booksize)

SIMOTION P
PC-based
Motion Control functionality compactly integrated in an industrial PC.
- SIMOTION P320-4 Embedded
- SIMOTION P320-4 Standard

SIMOTION C
Controller-based
Modular Motion Control system based on the field-proven design of the SIMATIC S7-300.
- SIMOTION C240: with analog and encoder interfaces for analog drives
- SIMOTION C240 PN: with onboard PROFINET interfaces
SIMATIC Controller – Motion Integrated
Motion Integrated is an integral component of every SIMATIC S7-1200 Basic Controller and SIMATIC S7-1500 Advanced Controller. It can be used to implement simple, high-performance motion control tasks in the familiar SIMATIC environment.

SIMATIC ET 200 – Technology modules
SIMATIC ET 200 function modules are intelligent modules belonging to the SIMATIC ET 200SP and ET 200MP distributed I/O systems. They can be deployed as central or distributed modules and can perform technological tasks autonomously and independently of the controller.

SIMATIC – Technology Controller
When deployed in conjunction with PLCopen-compliant motion control modules, the S7-300 Technology CPUs are the ideal solution for implementing the motion sequences of multiple-coupled axes.

SIMATIC – Function modules
Function modules are intelligent modules belonging to the SIMATIC S7 systems. They can perform technological tasks independently and therefore relieve the load on the CPU.

SIMATIC – Control systems and application modules
Application modules expand the flexibility of the CPU with additional computing power and therefore offer maximum performance for open-loop control, closed-loop control and calculation in the SIMATIC. The SIMATIC TDC control system also solves complex drive, control and communications tasks with maximum quantity structures and minimum cycle times.
Cheese production
at the touch of a button

The Altendorf village cheese dairy demonstrates fully automatic production of Swiss cheese using TIA.
In tool production as well, the real and virtual worlds are growing ever closer together. The SINUMERIK CNC will get you ready for this change and for the future – with suitable hardware for any machine concept, a consistent operating concept for all SINUMERIK CNCs, the potential for implementing different machining technologies on a single machine and technology packages for complex tasks such as milling.
SINUMERIK CNCs

SINUMERIK CNCs are designed to enable superefficient automation of workshop, contract and mass production processes. They open the way for innovative machine concepts and make it possible to boost productivity levels in mass and piece part production of workpieces of every kind.

Related products

SINUMERIK CNCs are supplemented by an intelligent spectrum of related CNC products and functions. For instance, manufacturing productivity is further enhanced by SINUMERIK Operate thanks to highly efficient operation for example, plus precise workshop programming and CNC simulation, systems that promote energy efficiency and safety and, last but not least, due to sophisticated training software.

To find out more about SINUMERIK CNCs, go to siemens.com/sinumerik
The Siemens portfolio of power supply products sets new standards in reliability, efficiency and integration. Siemens is offering a perfectly coordinated, all-inclusive range of products that can provide additional protection for power supplies against faults on the primary and secondary sides, or afford complete all-round protection. SITOP products are being tried and tested daily in millions of installations and are helping to ensure the reliable operation of machines and plants all around the world.

Complete integration of the power supply in TIA further enhances the level of operational reliability. In addition to the ease of engineering made possible by the TIA Portal, the SITOP PSU8600 power supply system and the SITOP UPS1600 uninterruptible power supply also offer diagnostic and maintenance systems. SENTRON protection, switching, and measuring devices include a broad offering of flexibly usable low-voltage components that ensure economical and efficient power distribution in industrial plants. The communicating 3VA molded case circuit breakers and 7KM PAC measuring devices reliably record all consumption values, thus providing a comprehensive overview of all energy-related data.
Power supply

A constant and reliable power supply is essential for the efficient operation of automation systems and, therefore, plants.

Circuit breakers

State-of-the-art molded circuit breakers are flexible, expandable, efficient, safe, and reliable, and are taking on more and more operational tasks.

Measuring devices

Measuring devices provide comprehensive information on the electrical installation and power distribution as well as key measured values for assessing the system state and the quality of the power network. For further processing measured data, the devices come with many communication options that make it extremely easy to integrate them into higher-level automation and energy management systems.
**SITOP compact**
The slimline 12 V and 24 V power supply units are the perfect choice for integration in distributed applications in control boxes or control cabinets – wherever space is of paramount importance. These units are highly efficient in operation over the entire load range and their low no-load losses are ideal for machines and installations that frequently operate in standby mode.

**LOGO!Power**
The mini power supply units in the flat design of the logic modules offer great performance in the smallest space and are ideal for use in distribution boards, for example: Efficient, flexible operation is possible thanks to their excellent efficiency over the entire load range and availability in versions with output voltages of 5 V, 12 V, 15 V and 24 V.

**SITOP lite**
Specially developed for basic requirements in industrial environments, single-phase 24 V power supplies offer all the important functions at a particularly favorable price, but without compromising on quality or reliability.

**SITOP smart**
This high-performance standard 24 V or 12 V power supply reliably supplies power to automated machines and installations. Despite their compact dimensions, these single- and three-phase power supply units with their continuous load capability of 120% of rated power offer an outstanding overload response with 1.5 times rated current for 5 s/min.

**SITOP modular**
The single-phase, two-phase and three-phase SITOP modular power supplies offer an excellent overload response and a broad range of functions for applications in complex installations and machines. The wide-range input allows connection to almost any electrical power system worldwide and ensures a high degree of reliability even if there are large voltage fluctuations.

**SITOP PSU8600**
This innovative power supply system from the SITOP modular product range can be fully embedded in TIA and the TIA Portal and provides a completely new set of parameterization and diagnostic tools. It is possible, for example, to individually adjust and monitor the voltage and current of each output. For the first time, users have access to information about the control circuit including energy flow data.
Expansion module for redundancy
SITOP redundancy modules afford additional protection from failure of the 24 V supply. They provide decoupling between two power supplies so that failure of a power supply unit does not affect the 24 V supply.

Expansion module for selectivity
SITOP selectivity modules distribute the load current between several branch circuits and monitor these circuits for overload or short circuit. If a branch circuit develops a fault, it is safely disconnected while the power supply to the loads in the other circuits, such as the PLCs, continues uninterrupted to prevent total failure of the installation.

DC UPS
The SITOP DC UPS unit offers perfect 24 V protection against unexpected mains failures and therefore ensures uninterrupted plant operation.

The SITOP UPS500S is equipped with completely maintenance-free double-layer capacitors for buffering the 24 V supply for a period of minutes, e.g. to allow safe power-down of PC-based automation systems.

The SITOP UPS1600 stores energy in battery modules so that power failures can be bridged for hours. It can be fully integrated into TIA via PROFINET. The control system is therefore continually supplied with operational information and battery status data.

SITOP in SIMATIC design
The original SIMATIC power supplies merge perfectly into the PLC network in terms of their design and functionality. They reliably supply SIMATIC systems and other loads with 24 V DC.

SIPLUS extreme power supplies
Modular power supplies based on LOGO!Power or SITOP smart for reliable operation under difficult to extreme conditions, such as an ambient temperature range in operation from –40°C to +70°C and relative humidity up to 100%, including condensation and frost.
Field – Power Supply and Distribution – Circuit breakers

3WL air circuit breakers
The 3WL air circuit breaker is flexibly deployable as infeed, distributor, coupling and output switch, simple to operate, and fully communication-capable. Performance range from 630 A to 6,300 A – with just three sizes and a comprehensive range of accessories. It can be connected to higher-level management system by using the standard bus systems.

3VA molded-case circuit breakers
As the key component of electrical energy distribution, the 3VA molded-case circuit breaker ensures high-availability production runs and meets the basic requirements for modern production environments. With open interfaces and standard protocols such as PROFINET and PROFIBUS, it can be seamlessly integrated into the existing technical infrastructure and automation environment. Integrated communication and measuring functions provide the necessary transparency for all consumption values of the increasingly networked and automated production processes.

Field – Power Supply and Distribution – Energy monitoring devices

7KT/7KM PAC energy monitoring devices
7KT/7KM PAC energy monitoring devices permit the precise, reproducible, and reliable measurement of energy values for the infeed, outgoing feeders, and individual loads. They provide comprehensive information on the electrical installation and power distribution as well as key measured values for assessing the system state and the quality of the power network. For further processing measured data, the devices come with many communication options that make it extremely easy to integrate them into higher-level automation and energy management systems.
Efficient interoperation of all of the automation components

Reis Robotics has used Totally Integrated Automation to reduce commissioning times by around 20 to 30 percent.
Whatever the application, whether production or material flow control, for example, or asset management, tracking and tracing or supply chain management, as the global leading supplier of identification systems with more than 30 years of solid technology and sector know-how, Siemens can offer the right identification solution as well as technology-neutral application advice.

As components of TIA, all current RFID systems and optical identification systems are especially easy to integrate into the TIA system.

Automatic data acquisition for economical production and logistics processes
SIMATIC RF200 – compact for standard HF applications

Ideal for industrial use on small assembly lines or in intralogistics: The system is compact in design and supports ISO 15693 transponders that are inexpensive, maintenance-free and suitable for use in harsh environments.

SIMATIC RF300 – power for the HF range

Ideal for production and material flow control: The scalable, maintenance-free and rugged system is particularly suitable for contactless identification in closed production sequences. For the most demanding requirements in terms of speed, data volume and diagnostics functionality, the RF300 mode with separate transponders is available.

SIMATIC RF600 – impressive in the UHF range

For versatile use in production applications and production-related logistics: With their long range, this great selection of UHF read and write devices allows many possible applications. The high reading rate minimizes errors and accelerates processes.

Optical identification

The stationary SIMATIC MV400 optical identification system is capable of reading codes on many different kinds of surface, whether they have been printed, laser-etched, punched or dot-peened. Code legibility can be continuously monitored by verification. The scope of functions is expanded by licenses for OCR and object recognition. An extensive choice of communication options – RS232, PROFIBUS, PROFINET or Ethernet – make it easy to integrate the readers into any automation system. The SIMATIC MV300 handheld reading systems with their integrated, complex image processing functions and illumination technologies can be used for the local capture of two-dimensional (2D) data matrix codes and one-dimensional (1D) barcodes on various surfaces.
SIMATIC ET 200 is a multifunctional, modular and finely scalable system for distributed automation which can be used to create perfect central and distributed solutions. Since all the necessary components are integrated in the TIA Portal, the entire system can be engineered quickly and efficiently. The ET 200MP is the perfect choice for central control cabinet configurations and the compact ET 200SP is ideal for distributed I/Os in the control cabinet, while the ET 200AL with type of protection IP65/67 plays to all its strengths when it is installed outside the control cabinet. SIPLUS HCS, the industrial heating control system, has been specially developed as a distributed I/O for heating processes. All products can be integrated in the automation system via PROFIBUS or PROFINET.
ET 200 systems for the control cabinet

SIMATIC ET 200 for application in control cabinets can be used to engineer compact block I/O solutions as well as modular, multifunctional systems. It is therefore the ideal product for flexible, efficient implementation of a wide variety of automation tasks – SIPLUS extreme ET 200 systems for reliable operation under difficult to extreme conditions.

ET 200 systems without control cabinet

The multifunctional SIMATIC ET 200 systems are ideal for use in harsh industrial environments and directly at the machine. Thanks to their high degree of protection IP65/67, they are impact-resistant, dirt-resistant and splash-proof. These systems are therefore ideal for fast, flexible implementation of distributed automation solutions in harsh operating environments.

SIPLUS HCS for heating processes

The SIPLUS HCS (Heating Control Systems) industrial heating controls can precisely control electric heating elements such as infrared radiators. A variety of systems is available depending on the heating process requirements such as, for example, heating element output rating, depth of diagnosis or degree of protection.

PROFIBUS components

SIMATIC offers network components for electrical and optical PROFIBUS fieldbus transmission technology – with more than 50 million installed nodes, the leading fieldbus system in the world. I/O devices can be connected quickly and easily to automation systems by means of standard PROFIBUS interfaces.

PROFINET components

Thanks to an extensive portfolio of development packages, PROFINET technology from Siemens can be deployed in any type of field device. Customers who wish to integrate fail-safe communication in addition to pure PROFINET communication can do so using the Starter Kit for PROFIsafe. Furthermore, Siemens offers a free telephone support service, on-site consultation and assistance with other activities from implementation to certification.

Industrial Wireless LAN components

For simple and inexpensive wireless machine networking. Components such as an IWLAN Client, SCALANCE W722-1 can be mounted directly on a SIMATIC ET 200SP in the control cabinet within a very small footprint. Thanks to a compatible component design, they can be seamlessly integrated into an industrial wireless LAN.
The integrated drive system approach paves the way to digitization, among other things, through the three-fold integration of drive technology and is therefore the answer to the high degree of complexity currently challenging customers in the industry.

The horizontal, vertical, and life cycle integration of integrated drive systems ensures that every drive component fits seamlessly into any drive system, any automation environment, and the entire life cycle. The outcome is an optimal workflow from engineering to service that guarantees more productivity, increased efficiency, and better availability of customer applications.

IDSs noticeably reduce time to market and time to profit.

- Productivity: increased throughput thanks to optimal performance, reduced engineering effort
- Efficiency: optimized energy efficiency, extremely simple maintenance
- Reliability: maximum availability, improved operating times, greater security of investment

Integrated Drive Systems – extra value integrated
Converters

With SINAMICS, Siemens offers you a platform that optimally meets the elevated requirements in the low-voltage, medium-voltage, and DC-voltage ranges. This complete and integrated drive family addresses all of the performance levels and is characterized by an extremely high degree of flexibility, functionality, and future viability. The comprehensive portfolio is remarkable for its integrated engineering, easy integration into the automation landscape, and extensive safety features. SINAMICS has the right converter for every application, power rating, and performance level.

Motors

The spectrum of synchronous and asynchronous electric motors, ranging from standard motors to servo motors for motion control applications, and also including high-voltage and DC motors, has a breadth and depth that is unparalleled anywhere in the world. The decisive factor is, however, that each individual SIMOTICS motor is exceptionally compact, rugged, powerful and reliable and, at the same time, extremely efficient.

Geared motors

The extensive geared motor portfolio of Siemens includes the right solution for every drive application – with most products available quickly and inexpensively from the standard range. The new SIMOGEAR geared motor in particular offers exceptional flexibility thanks to the extensive range of different gear types, and the outstanding adaptability and compact dimensions of the motors. Siemens can also supply servo geared motors for motion control tasks in all sectors of industry.

Gear units

Under the product series name FLENDER, Siemens offers a comprehensive portfolio of components in mechanical drive technology. These include spur gear units, helical bevel and bevel gear units, planetary gear units as well as couplings. FLENDER gear units stand for highest efficiency and absolute reliability. They offer a large variety and the most comprehensive application-specific gear unit program. Customers find the right solution for their requirements and benefit from the high plant availability and absolute process reliability, low life cycle cost and great flexibility.
Couplings

As the largest manufacturer of industrial couplings worldwide, Siemens offers a comprehensive portfolio in the torque range from 0.1 – 10,000,000 Nm. Siemens has a tremendous amount of experience in numerous industrial sectors. With our FLENDER couplings we service almost all branches of industry worldwide. A comprehensive assortment of flexible, highly flexible, torsionally rigid and hydrodynamic couplings are available for this purpose in a variety of sizes and designs. We place special emphasis on safety and reliability in the construction of FLENDER couplings. FLENDER couplings – proven millions of times.

Tools for efficient engineering

Siemens assists you in identifying savings potential and enables energy efficiency analyses of products, systems, and applications. Our tool portfolio provides you with professional tools for everything from the configuration of simple drive components to the engineering of complex drive systems and solutions. Siemens is also your reliable partner for commissioning and diagnostics.

Application examples

To meet the growing challenges for quick and easy solutions in automation and drive technology, Siemens offers all interested customers prepared sample application which can be downloaded free of charge at any time.

The sample applications offer:
• Explanation of the necessary project planning steps with screenshots
• Reusable SIMATIC modules
• Delivery of functionally coordinated programs and modules
• Significant reduction of commissioning times

www.siemens.com/sinamics-applications
support.industry.siemens.com/cs/ww/en/ps/13204/ae
SINAMICS V20
This versatile inverter for basic applications is characterized primarily by its ease of operation, rugged design and cost efficiency.

SINAMICS V90
The performance-optimized, easy-to-use servo drive system. Plug-and-play commissioning, optimized servo performance and rapid integration into SIMATIC controller systems.

SINAMICS G110D
The distributed inverter for basic applications

SINAMICS G120C / G120 / G120D
Compact, modular, distributed inverters with output ratings up to 250 kW.

SINAMICS G120P
The specialist for pumps, fans, and compressors
Ideal for building management systems, the water industry and the process industry (HVAC).

SINAMICS G130 / G150
The universal converter for high power ratings
U/f control and vector control with or without sensor.

SINAMICS S110
The specialist for simple positioning tasks
AC/AC device for positioning single axes with synchronous or asynchronous motors.

SINAMICS S120
The flexible, modular drive for sophisticated applications
System modules available in a variety of versions and with a wide range of options.
Field – Drive Systems – Converters: Low-Voltage Converters

**SINAMICS S150**
The converter for complex applications in the high output range: test bays, elevators and cranes, cross-cutters and shears, conveyor belts, presses, cable winches, and centrifuges.

**SINAMICS G180**
The converter specifically designed for the oil and gas, chemical and process industries.

**SIPLUS extreme**
Sophisticated standard modules based on SINAMICS, MICROMASTER, and SIMODRIVE POSMO A for extreme ambient conditions.

Field – Drive Systems – Converters: Medium-Voltage Converters

**SINAMICS Perfect Harmony GH180**
Today's most proven cell-based, medium-voltage converter – with an integrated transformer and an output range from 150 kW to 20.9 MW.

**SINAMICS GM150**
The universal drive solution for single drives in the medium-voltage range
Output range 820 kW to 18 MW.

**SINAMICS Perfect Harmony GH150**
The next level in terms of versatility and high availability for cell-based, medium-voltage converters – with a separate transformer and an output range from 4 MW to 28.6 MW.
SINAMICS S150
The converter for complex applications in the high output range: test bays, elevators and cranes, cross-cutters and shears, conveyor belts, presses, cable winches, and centrifuges.

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SINAMICS Perfect Harmony GH150
The next level in terms of versatility and high availability for cell-based, medium-voltage converters – with a separate transformer and an output range from 4 MW to 28.6 MW.

SINAMICS SM150
A sophisticated drive solution for single- and multi-motor drives in the medium-voltage range
Output range 2.8 MW to 40 MW.

SINAMICS SL150
The cycloconverter for low-speed, high-torque asynchronous and synchronous motors
Output up to 40 MW.

SINAMICS GL150
Rugged single drive for high-speed, high-output synchronous motors up to 85 MW.

SINAMICS SM120 CM
Customized drive systems for special requirements in the output range from 3 MW to 11.3 MW.

Field – Drive Systems – Converters: DC Converters
SIMOREG DC Master
For maximum cost-effectiveness – high-performance converters with integrated intelligence
Permissible supply voltages: 400 V...950 V.

SINAMICS DC Master
The scalable, reliable and future-ready solution for DC drives in all performance classes
Rated direct current from 15 A to 3,000 A.
### SIMOTICS GP
Asynchronous motors with aluminum enclosure for mains operation up to efficiency class IE4, or for converter-fed operation with super-efficient synchronous reluctance technology. Outstanding reliability, power and cost-effectiveness. Lightweight, compact motors, e.g. for pumps, fans, and compressors.
Output range from 0.09 kW to 45 kW in 1LE 10.

### SIMOTICS SD
Asynchronous motors with gray cast-iron enclosure for use in harsh environments and under demanding conditions, e.g. for mixers and mills and in the process industry. For mains operation with efficiency classes up to IE4 or for converter-fed operation with synchronous reluctance technology for extremely low operating costs.
Output range from 0.09 kW to 315 kW.

### SIMOTICS XP
Explosion-proof motors for use in potentially explosive environments in zones 1, 2, 21, and 22, in efficiency classes up to IE3 for mains and converter operation.
Output range from 0.09 kW to 1,000 kW.

### SIMOTICS DP
Numerous industry- and customer-specific motors, mechanically or electrically modified for efficient operation under special conditions or in specific applications, including marine, harbor crane, roller table, and tunnel applications.
Output range from 0.09 kW to 315 kW.

### SIMOTICS FD
The modular and very smart basis for an economical overall system comprising motor and converter with high power density and with a pioneering modular system that meets a vast array of diverse requirements, from air cooling to water cooling and condition monitoring.
Output range from 200 kW to 1,800 kW.

### SIMOTICS GP/SD synchronous reluctance motors
High-productivity motors with synchronous-reluctance technology designed exclusively for converter operation and specifically optimized for SINAMICS G120. The system is characterized by very low life cycle costs (system efficiency IES2) and extreme efficiency, especially in the partial load range and with highly dynamic performance.
Output range from 0.55 kW to 30 kW.
SIMOTICS HT
High-torque motors with torques of up to 42,000 Nm
Gearless, permanent-field synchronous motors for applications in the paper and steel industries for example, with output ratings up to 2,100 kW and torques up to 42,000 Nm.

SIMOTICS TN
Non-standard motors for powerful drive performance in the low-voltage range, with all the usual cooling methods, as mains or converter motors, with a host of options covering high-power applications in a wide variety of industries, including chemicals, oil & gas, cement, mining, paper, water and wastewater, steel, and shipbuilding.
Output range from 200 kW to 5,000 kW.

SIMOTICS S servo motors
Servo motors with maximum dynamic response and precision properties
The portfolio of motion control motors is completed by servo geared motors.

SIMOTICS M main motors
Main motors with a world-beating range of performance and flexibility of selection thanks to their modular construction.

SIMOTICS L linear motors
Linear motors for extreme dynamic response, peak power and precision in linear movements.

SIMOTICS T torque motors
Torque motors offering maximum precision across the entire torque range in an extremely compact design for rotary axes.
**SIMOTICS DC**
Low-maintenance DC motors ideally suited for use with SINAMICS DCM converters with outputs from 31.5 kW to 1,610 kW.

**SIMOTICS HV asynchronous and synchronous motors with outputs up to 100 MW and above**
High-voltage motors for maximum reliability and efficiency of the core process – optimized for perfect interaction with SINAMICS medium-voltage converters.

**SIMOGEAR geared motors**
The SIMOGEAR series of geared motors includes helical, parallel shaft, bevel helical and worm geared motors, covers an output spectrum ranging from 0.09 kW to 200 kW and gear unit rated torques of up to 19,500 Nm. The connection dimensions of SIMOGEAR have been selected to ensure that it is fully compatible with the current standard and with many other makers of geared motors.
FLENDER helical gear units
FLENDER helical and bevel-helical gear units are state-of-the-art drive solutions that successfully meet a wide range of sometimes extreme demands day in and day out, year after year.

FLENDER SIP
With FLENDER SIP planetary gear units, we offer you a range of fatigue-resistant, reliable, finely spaced gear unit solutions.

FLENDER PLANUREX 2
PLANUREX 2 are the top selling planetary gear units in the world. Not only have they have proven their worth over the course of many years in a wide variety of applications and under the most severe operating conditions, but their high quality has also enabled them to set global standards.

FLENDER PLANUREX 3 XL
PLANUREX 3 represents a new generation of planetary gear units with an extremely high power capacity that can be used in a wide range of applications. Their extreme efficiency and compactness means that they can achieve high torques within a small space.

Torsionally rigid gear couplings – the ZAPEX series
Robust couplings made of high-quality quenched and tempered steel with a good power-weight ratio are ideal for the most severe operating conditions.

Torsionally rigid all-steel couplings – the ARPEX series
ARPEX all-steel couplings are extremely compact and characterized by an especially good power-weight ratio. Their versatility makes them suitable for universal use.
Backlash-free couplings – the BIPEX-S and SIPEX series
We offer you a wide range of types and sizes in two model ranges for problem-free installation: vibration-damping and electrically insulating plug-in BIPEX-S elastomer couplings and SIPEX metal bellows couplings with high torsional stiffness for angle-preserving torque transmission.

Torsionally flexible couplings – the N-EUPEX, RUPEX, and N-BIPEX series
These versatile, flexible couplings are used throughout the field of mechanical engineering. They are suitable for plug-in assembly and easy to install. Their flexible elements compensate for shaft misalignments and absorb moderate shock loads of motors and driven machinery.

Highly flexible couplings – the ELPEX, ELPEX B, and ELPEX S series
ELPEX couplings are free of torsional backlash. Because of their low torsional stiffness and damping capacity, these couplings are especially suitable for coupling machines with a very non-uniform torque pattern or with high shaft misalignment.

Fluid couplings – the FLUDEX series
FLUDEX couplings limit the starting and maximum torques in a drive train and use the operating slip for their function as a starting aid for the motor, as overload protection in the case of malfunction, and as a vibration decoupler.

SinaSave energy-saving tool
The web-based SinaSave tool calculates and compares the energy requirements of various drive products and systems by using individual operating characteristics as well as plant-specific parameters. Based on investment and operating costs as well as energy-saving potential, SinaSave calculates the expected payback time. The result: fast, straightforward decision-making assistance for financially assessing the investment in energy-efficient products.

For further information, please go to: www.siemens.com/sinasave

Drive Technology Configurator selection tool
Fast, efficient selection of optimum products for your application – starting with gear units, motors, converters and associated options and components and progressing to the selection of controllers, software licenses and connection systems.

For further information, please go to: www.siemens.com/dtconfigurator
**SIZER for Siemens Drives configuring tool**
Simplifies the project engineering for low-voltage drive systems. On the basis of your application, the tool will help you to define the mechanical system and to design converters, motors and gear units as well as the open-loop and closed-loop controls.
For further information, please go to: www.siemens.com/sizer

**SIZER WEB ENGINEERING tool**
Menu-assisted workflows guide you systematically through the technical selection and dimensioning process for low-voltage and medium-voltage products and drive systems including accessories. Based on an integrated query function, SIZER WEB ENGINEERING can also provide you with special customized solutions for applications that cannot be addressed using "Standard Products."
For further information, please go to: www.siemens.com/sizer-we

**STARTER commissioning software**
Assistance with parameterization, commissioning, diagnostics and servicing. It is possible to import all relevant data from the electronic type plates of the drive components using STARTER. This functionality speeds up parameterization, prevents the risk of input errors and so simplifies the entire process. Using the integrated test functions, you can check and automatically optimize your parameter settings.
For further information, please go to: www.siemens.com/starter

**SINAMICS Startdrive – commissioning software in the TIA Portal**
SINAMICS Startdrive commissioning software enables the easy and intuitive integration of SINAMICS drives into the automation landscape. Because SINAMICS Startdrive has an identical operating concept to that of other parts of the TIA Portal, SINAMICS converters can be integrated into automation solutions and put into service quickly, easily and conveniently.

**Simulation Tool for Soft Starters (STS)**
With the new STS (Simulation Tool for Soft Starters), we provide a convenient way of designing soft starters using a simple, quick and user-friendly interface. You just need to enter the motor and load data to simulate the application. The tool then suggests suitable soft starters.

**Soft Starter ES**
Parameterization and evaluation software for soft starters
The Soft Starter ES software allows you to parameterize, monitor, and perform diagnostics during servicing for SIRIUS 3RW44 High Feature soft starters quickly and easily. 

**Backlash-free couplings – the BIPEX-S and SIPEX series**
We offer you a wide range of types and sizes in two model ranges for problem-free installation: vibration-damping and electrically insulating plug-in BIPEX-S elastomer couplings and SIPEX metal bellows couplings with high torsional stiffness for angle-preserving torque transmission.

**Torsionally flexible couplings – the N-EUPEX, RUPEX, and N-BIPEX series**
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For further information, please go to: www.siemens.com/dtconfigurator
**Motor Starter ES**

Parameterization and evaluation software for motor starters

The Motor Starter ES software allows you to parameterize, monitor, and perform diagnostics during servicing for SIRIUS motor starters quickly and easily.

**powerconfig**

Configuring, visualizing and controlling with SENTRON

The powerconfig software is the combined commissioning and service tool for communication-capable measuring devices and circuit breakers from the SENTRON product family. It supports the communication interfaces PROFIBUS, PROFINET, Modbus RTU and Modbus TCP.

**Field – Drive Systems – Central and Distributed Motor Starters**

**SIRIUS M200D motor starter**

The SIRIUS M200D device family is available in two versions – basic and standard – for AS-Interface, and one version for PROFIBUS and PROFINET. These devices start and protect your motors and loads up to 5.5 kW, whether they are direct-on-line or reversing starters, or switch mechanically or electronically, or whether they have optional brake control or local manual operation.

**ET 200pro motor starter**

ET 200pro motor starters are the solution: They start and protect motors up to 5.5 kW in conveyor systems, for example. Thanks to their high degree of protection, they can be installed directly at the machine, so making them the ideal choice for distributed drive solutions. Based on the modular concept of SIMATIC ET 200pro, they remain flexible. Because this system is characterized by modularity. Depending on the application, the system comprises an interface module, expansion modules for sensors and, for example, motor starters. It can be expanded at any time, and you only have to install the modules you really need.

**ET 200S motor starter**

The discretely modular ET 200S motor starters in the SIMATIC ET 200S I/O system are the solution:

They start and protect motors up to 7.5 kW and are installed as distributed components in the control cabinet, for example, in plant and mechanical engineering applications, so making them the ideal choice for distributed drive solutions. Based on the modular concept of SIMATIC ET 200S, they remain flexible. Because this system is characterized by modularity. It can thus be adapted at any time.
Industrial Controls: simply SIRIUS

SIRIUS features a comprehensive portfolio of industrial controls products. Thanks to their modular design, our perfectly coordinated products can be easily configured or installed in the control cabinet or integrated into distributed systems.

The SIRIUS product range comprises devices that perform switching and starting, and protecting and monitoring functions, as well as combinations thereof, which are known as “load feeders.” Since all the devices are electrically and mechanically compatible, it is extremely easy to combine them to create load feeders.
SIRIUS modular system

Assembling control cabinets must be fast, simple, flexible and space-saving. But how can this be achieved? With the unique SIRIUS modular system that offers everything you will need for switching, protecting and starting motors and systems. In other words, it provides a modular range of standard components up to 250 kW / 400 V in just seven sizes that are perfectly coordinated, easy to combine and (in most cases) use the same accessories. That’s how easy industrial controls can be.

The SIRIUS product range comprises devices that perform switching and starting, and protecting and monitoring functions, as well as combinations thereof, which are known as “load feeders.” Load feeders can be created from the following devices:

- 3RT / 3RH contactors
- 3RF solid-state switching devices
- 3RW soft starters
- 3RV motor starter protectors
- 3RR monitoring relays
- Thermal (3RU) or electronic (3RB) overload relays

Since all the devices are electrically and mechanically compatible, it is extremely easy to combine them to create load feeders. As an alternative, pre-assembled 3RA2 load feeders or 3RA6 compact starters. In addition to the devices mentioned above for the main circuit, devices for the control circuit are also available: 3RA28 function modules for mounting on 3RT2 contactors and 3RA27 function modules for connection to the higher-level control.

SIRIUS motor starters

Whether communication-capable motor starters or simple load feeders – the starting possibilities provided by the SIRIUS system are extremely diverse. With switching and protection devices and with a broad range of accessories, a diverse array of starting applications can be implemented in an extremely simple and practical way. Regardless of whether you are looking for a central or distributed motor starter solution.

SIRIUS soft starters

SIRIUS 3RW soft starters are an economic alternative to direct-on-line or wye-delta starting for starting three-phase motors in the control cabinet. Mechanical impacts inside the machine or voltage dips in the power supply system are typically unpleasant side effects. The soft start in the control cabinet can be easily and practically implemented for almost all applications with our complete range of products.
SIMOCODE
SIMOCODE provides optimum use of constant-speed motors in the low-voltage range for plants. The flexible and efficient motor management system in modular design combines all necessary protection, monitoring, safety and control functions for each motor feeder. It can be easily connected to the automation system via PROFIBUS or PROFINET. The data transparency gained this way increases the process control quality from planning to assembly all the way to operation or maintenance of a plant while reducing costs at the same time.

SIPLUS SIMOCODE pro 3UF7 Motor Management and Control Devices
SIPLUS SIMOCODE pro is the flexible and modular management system for motors in the low-voltage range. It can be easily and directly connected to your automation system via PROFIBUS DP, thus ensuring reliable operation with zero maintenance in the extended temperature range as well as in corrosive gas atmospheres.
Integrated Engineering

Industrial Data Management

Industrial Communication

Industrial Security

Safety Integrated

Added value in all automation tasks
Industrial machines are becoming increasingly complex.

How can we achieve maximum availability at optimized cost?

Business Specific Services for Totally Integrated Automation combine profound product- with industries know-how for:

- Fast engineering with application examples, tutorials and technical forums
- Individual support by Siemens experts of technical support
- Reliable on-site support through global service setup
- Competence development through technical trainings for products and TIA Portal

Comprehensive support with:

- Modernization
- Optimization with Smart Data

Tailored for customers from several industries

Reliable support and services throughout the entire life cycle of machines and plants

Availability  Costs  Future-proof
Siemens provides automation and drive products with industrial security functions that support the secure operation of plants or machines. They are an important component in a holistic industrial security concept. With this in mind, our products undergo continuous further development. We therefore recommend that you check regularly for our product updates and only use the most recent versions. For more information, visit:

You can also register there for product-specific newsletters.

For the secure operation of a plant or machine, it is also necessary to take suitable protective measures (e.g. cell protection concept), and to integrate the automation and drives components into a holistic, state-of-the-art industrial security concept for the entire plant/machine. Any third-party products that may be in use should also be considered. You can find further information at:

www.siemens.com/industrialsecurity

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit http://support.automation.siemens.com.

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