Totally Integrated Automation – The bigger picture

Overview of product portfolio for Factory Automation
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.

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
Integrated Engineering

Industrial Data Management

Industrial Communication

Industrial Security

Safety Integrated

Manufacturing Execution System

SCADA Systems

Energy Management

Totally Integrated Automation Portal

Controller

HMI

IPC

Communication

Motion Control

CNC

Controller HMI IPC Communication Motion Control CNC

Power Supply Industrial Identification Distributed I/O Drive Systems Industrial Controls

Added value in all automation tasks

Integrated Engineering

Industrial Data Management

Industrial Communication

Industrial Security

Safety Integrated
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.
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, more reliable.
The **digitization of automation** is progressing steadily.

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

This offers many **benefits**, while also entailing **risks**.

**Industrial Security**

with Totally Integrated Automation provides **comprehensive protection** for:

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

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.

**Security**

- **efficient**
- **24/7**
- **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.

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

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

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

- efficient
- 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) is the innovative engineering framework for all automation tasks. The TIA Portal permits efficient configuration, requiring up to 30% less time to program controllers and visual components, as well as to configure drives, networks, power supplies and fail-safe applications.

**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**

This tool helps you to pick, configure and order devices for Totally Integrated Automation. The TIA Selection Tool provides wizards for selecting the required devices and networks. In addition, there are configurators for selecting modules and accessories and for checking the correct functionality. The TIA Selection Tool creates a complete ordering list from your product selection or product configuration. You can export the list directly to the Industry Mall or CA 01 cart.
Industrial Data Management

Transparency of all data generated during operation enables high decision-making certainty – for maximum plant operations cost-efficiency.

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.

Maintenance

The SIMATIC Maintenance Station visualizes maintenance information from all the automation systems in a plant. The relevant data, supplied by a wide variety of connected stations – such as control components, switchgear, drives etc. – is visualized uniformly and clearly by the Maintenance Station. Each component makes its individual functionalities available to the overall system.

Energy management

Totally Integrated Automation also means that efficient operational energy management can be implemented without any great effort. For this purpose, energy flows throughout the plant are made transparent, and precisely analyzed. In this way, specific potential savings can be identified and deliberate actions taken to exploit this potential. The result: a sustainable increase in efficiency and optimum utilization of resources leads to an improved cost situation – and thus to greater competitiveness.
Industrial Communication

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

PROFINET

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 – even on a wireless basis using Industrial Wireless LAN with PROFIsafe.

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.

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.

SIMATIC HMI Mobile Panels of the 2nd generation

Latest example – SIMATIC HMI Mobile Panels of the 2nd generation. These offer an innovative safety solution with a unique emergency stop button that only becomes active and lights up red when the device is connected to a safety circuit via the connection box.
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.

**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 throughout 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.

**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 information. 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 solution at MES level at any time.
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.
SIMATIC WinCC SCADA system

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.

SIMATIC WinCC Open Architecture SCADA system

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.
Operational energy management in industrial plants makes a crucial contribution toward improving the cost situation and hence also to the competitive capability of a company. It is therefore an essential aspect of TIA. The energy flows in production plants are made transparent, so that any existing energy-saving potential can be identified, analyzed and ultimately exploited.

Whether at the management or field level, the extensive Siemens portfolio enables potential savings to be detected and utilized. From the SIMATIC B.Data energy management system to the visualization of consumption on the operating panel of the machine – SIMATIC is the seal of quality in production technology.
SIMATIC powerrate

SIMATIC powerrate for the SIMATIC PCS 7 process control system and the SIMATIC WinCC process visualization system records all energy-relevant consumption data of a plant, allocates it to the respective loads, visualizes it in a transparent manner and saves it in the archive. This enables hidden energy-saving potential to be reliably tracked down and energy costs reduced in the long term.

7KT/7KM PAC measuring devices

The energy monitoring system from the Siemens SENTRON portfolio, approved by the German Technical Inspectorate, makes energy flows transparent and is therefore the ideal basis for setting up an operational energy management system according to ISO 50001. The 7KT/7KM PAC measuring devices precisely and reproducibly measure the power values for incoming feeders, outgoing feeders or individual consumers.

powermanager

The powermanager software records, visualizes and archives energy and performance values. You can use powerconfig to configure and operate the 7KM PAC measuring devices, among others. Siemens is the first vendor in the world to receive the certificate of conformity of the German Technical Inspectorate Rhineland for the 7KT/7KM measuring devices and the powermanager energy monitoring software.

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.
SIMATIC
Energy Management – at a glance!
The TIA Portal provides you with an integrated engineering framework of the next generation that gives you the best possible support when optimizing all plant, machine and process sequences.

The TIA Portal offers a standardized and consistent operating concept. It integrates controllers, distributed I/O, HMI, power supply, 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 Engineering Framework

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.

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 M4

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.

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.

Controller software in TIA Portal

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TIA Portal Engineering Framework
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. From planning, commissioning, operation and maintenance to the expansion of automation systems, TIA Portal saves engineering time, expense 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).
• SIMATIC STEP 7 Professional
• SIMATIC STEP 7 Safety Advanced
• SIMATIC STEP 7 Basic

Configuration of the SINAMICS drive family integrated into the TIA Portal – Startdrive
Startdrive is a tool, integrated into the TIA Portal, for the configuration, commissioning and diagnostics of the SINAMICS family of drives.

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
SIMATIC Controller – the intelligent choice for your automation task

The extensive portfolio of SIMATIC Controller offers the optimum solution, not only for smaller automation tasks, but also for extremely complex system solutions. 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 or safety solutions, SIMATIC Controller are a sound investment in the future, with which you can respond to new challenges with speed, flexibility and efficiency.
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 and safety 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 combines 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, 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. 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 30 or 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 Controllers 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. 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.

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 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 S7-400
Thanks to high communication performance and integrated interfaces, as well as communications processors, SIMATIC S7-400 is optimally prepared for large-scale tasks, such as the coordination of entire plants. The performance is scalable thanks to a graded range of CPUs; the I/O capacity is almost unlimited.
**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 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-lever 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 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.
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.

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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.

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.

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 heralds the next generation of the successful Siemens logic module. This new module accommodates virtually all customer demands with simplified handling, a new display, and full communication options via Ethernet. It also makes the web server application extremely easy, as no HTML programming knowledge is necessary. A communication module provides for remote communication via cellular phone networks, completing the range of new ways to use LOGO!
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:
- 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 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 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 conditions or intrinsically safe HMI devices for hazardous areas.
**HMI Key Panels**
Innovative operator panels for use in PROFINET networks.
SIMATIC HMI KP8 / KP8F / KP32(F)
For further information, visit: www.siemens.com/key-panels

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

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

**HMI Mobile Panels**
Portable operator devices for flexible operator control and monitoring. SIMATIC Mobile Panels 177 / 277 / 277F IWLAN
For further information, visit:
www.siemens.com/mobile-panels

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**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
No downtime – production up by 150%

Canyon Rock on Totally Integrated Automation.
Quality, reliability, performance – SIMATIC IPC

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 in various designs with different functionalities. 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.
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. The various SIMATIC Panel PC choices 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.
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

Control – IPC – Distributed operator control and monitoring

Industrial Flat Panel
Industrial monitors for practical gesture and multi-touch operation.

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

Powerful and open to new ideas.
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, wireless or remote. 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.

Maximum integration for maximum 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 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
Space-saving, low-cost and industry-compatible entry level solution
The switches of the SCALANCE X-000 product line are unmanaged Industrial Ethernet switches for implementing simple machine networking.

SCALANCE X-100 unmanaged
For a reliable network solution with all equipment details
These switches are robust, unmanaged Industrial Ethernet Switches in a variety of port versions.
Also available as media converters.

SCALANCE X-200 managed
For all network structures, from machine-level applications to networked subsystems
These all-purpose switches are excellently suited for setting up line, star and ring topologies up to 100 Mbit/s. There are many designs, including an extra-low profile version or a version for bumpless, redundant network structures.

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.

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.
Control – Communication – Industrial Ethernet Switches

**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.

**SCALANCE X-500 managed / Layer 3**
Construct high-performance plant networks and connect them to the IT world
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. Connect your plant network to your corporate IT network – for complete networking from control to management level.

Control – Communication – Industrial Ethernet Security

**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.

Control – Communication – Industrial Ethernet – Network management

**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.

Control – Communication – Industrial Wireless Communication

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. Demanding applications with real-time and redundancy requirements are possible on a wireless basis using PROFIsafe.
• 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
• TIA Portal integration

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.
TeleControl Basic
For the monitoring and control of remote machines and plants by mobile cellular radio (GPRS, LTE) or Internet. The remote control system for basic applications links the control center with the substations that are based on SIMATIC S7-1200. Typical applications include the control of process plants, the optimized operation of municipal facilities for water/wastewater treatment and traffic monitoring, as well as maintenance and repair.

TeleControl Professional
The comprehensive TeleControl Professional system is intended for demanding monitoring and control tasks in widely distributed process engineering plants. TeleControl Professional is deployed, for example, in water supply and wastewater treatment, power generation and distribution, or in district heating systems. TeleControl Professional demonstrates its enormous versatility in the selection of the transmission network. The control center is networked with the remote stations via private or public communication infrastructures (remote networks), such as dial-up networks, dedicated lines, Internet and mobile cellular radio. The communication uses proven standardized transmission protocols.

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.
Control – Communication – Industrial Communication for extreme ambient conditions

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

Control – Communication – 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.
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.

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.

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.
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)
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

The number of potential applications for converters is virtually limitless, and converter-fed operation of motors can in many cases significantly reduce energy consumption. Irrespective of the drive application, whether a simple drive, an extremely dynamic servo drive for Motion Control applications up to medium-voltage drive systems, the SINAMICS converter series can always offer an innovative converter that is ideally suited to the task in hand. 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 embedded 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.
Future-ready solutions for tool production

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.
SITOP compact
The slimline SITOP compact devices 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 different output voltages.

SITOP lite
Specially developed for basic requirements in industrial environments, SITOP lite offers all the important functions at a particularly favorable price, but without compromising on quality or reliability.

SITOP smart
SITOP smart is the high-performance standard power supply for automated machines and installations with 24 V or 12 V electronics. Despite their compact dimensions, these dependable devices 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.
**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.

**Expansion modules and DC UPS**

**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 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.
Efficient interoperability of all automation components

Reis Robotics has used Totally Integrated Automation to reduce commissioning times by around 20 to 30 percent.
Automatic data acquisition for economical production and logistics processes

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 code reading systems are especially easy to integrate into the TIA system.
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 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.

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.

Code reading systems

The stationary SIMATIC MV400 code reading systems are 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 including applications in potentially explosive atmospheres.

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 a SIMATIC ET 200SP can be seamlessly integrated into an industrial wireless LAN within a very small footprint in the control cabinet – thanks to suitable component design.
Integrated Drive Systems – extra value integrated

Siemens Integrated Drive Systems are the world’s only genuine end-to-end solution for complete drive systems. They are fully integrated – both at drive level with all frequency converters/inverters, motors, couplings and gear units from a single source, and at communication and information level with Totally Integrated Automation and with a holistic overview covering every stage of the life cycle. As a result, the time-to-market is appreciably reduced and so helps to shorten the time-to-profit.

Seamless integration of components into the automation environment as a whole is an essential precondition for achieving a production process with maximum value added. As a TIA component, this is exactly what is offered by Integrated Drive Systems from Siemens. They are perfectly integrated into the system architectures of the total industrial production process – from field level up to the Manufacturing Execution System. The result: maximum communication, optimum control potential and optimized processes. And the TIA Portal also ensures superefficient engineering of the automation solution with respect to the drives.
Conventional applications for converters are virtually limitless, and converter-fed operation of motors can in many cases significantly reduce energy consumption. Irrespective of the drive application – whether a simple drive, an extremely dynamic servo drive for motion control applications, medium-voltage drive systems or individually configured solutions – the SINAMICS converter range can always offer an innovative converter that is ideally suited to the task in hand. 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 dazzles.

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 10 – 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.

Selection and engineering tools

Professional tools for efficient selection, configuring and commissioning

Whether you need to configure simple drive components or engineer complex drive systems, Siemens can supply the right professional tools for the job. Siemens will also provide assistance with commissioning and diagnostics and lend support in the process of identifying savings potential and analyzing the energy efficiency of products and applications. These are also aspects of TIA.
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 G110
The versatile inverter for low power ratings
Ideal for use with LOGO! and SIMATIC S7-1200 controller.

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
Available in a variety of different versions.

**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**
Refined standard modules based on MICROMASTER and SIMODRIVE POSMO A for extreme ambient conditions

**SINAMICS Perfect Harmony GH180**
The number 1 medium-voltage converter
Most compact medium-voltage converter with an output range from 150 kW to 15 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 number 1 medium-voltage converter
Excellent versatility for cell-based medium-voltage converters from 4.16 MW to 11.7 MW.
**SINAMICS S120**
The flexible, modular drive for sophisticated applications Available in a variety of different versions.

**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**
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**Field – Drive Systems – Converters: Medium-Voltage Converters**

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**SINAMICS SM150**
A sophisticated drive solution for single- and multi-motor drives in the medium-voltage range Output range 2.8 MW to 31.5 MW.

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

**SINAMICS GL150**
Rugged single drive for high-output synchronous motors Particularly for 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.

**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 0.18 kW to 315 kW.

**SIMOTICS XP**
Explosion-proof motors for use in potentially explosive environments
Motors with types of protection Increased safety “e,” Flameproof enclosure “d,” Non-sparking “nA” and Dust explosion protection “t” for maximum safety.

**SIMOTICS DP**
Industry and customized motors for special applications
Marine, crane, roller table, smoke extraction motors and a variety of customized, mechanically or electrically modified motors for efficient operation under special conditions or in specific applications.

**SIMOTICS FD**
Modular and really smart – for outputs of 200 kW and above, the SIMOTICS FD provides the perfect basis for an economical complete system comprising motor and converter with high power density. This pioneering modular system can deliver just the right version for a vast array of diverse requirements. From air cooling to water cooling and condition monitoring, the motor offers drive solutions up to 1,600 kW.

**SIMOTICS TN**
Trans-standard motors for powerful drive performance in the low-voltage range
The rugged trans-standard motors ensure reliable operation in the output range from 200 kW to 1,250 kW even under harsh conditions.
**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 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 L linear motors**
Linear motors for extreme dynamic response, peak power and precision in linear movements.

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

**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 55 kW and gear unit rated torques of up to 8,000 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.

**MOTOX**
Geared motors for mains and converter-fed operation Helical, parallel shaft, bevel helical, helical worm, and worm geared motors.
**SIMOTICS DC**
Low-maintenance DC motors ideally suited for use with SINAMICS DCM converters with outputs from 31.5 kW to 1,610 kW

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**MOTOX**
Geared motors for mains and converter-fed operation

**SinaSave energy-saving tool**
SinaSave calculates energy-saving potential and amortization periods based on your individual conditions of use and thus offers you practical assistance in making decisions about investments in energy-efficient drive technology.
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
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.
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.

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.
Totally Integrated Automation interactive:

Discover the efficient interoperability of all automation components
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 3RA 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.
Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. The products and solutions from Siemens undergo continuous development with this factor in mind. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Any third-party products that may be in use must also be taken into account. For more information about industrial security, visit http://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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