PROVEN PERFORMANCE FOR PROCESS CONTROL

SIMATIC PCS 7

Distributed Control System

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SIEMENS

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The SIMATIC PCS 7 Distributed Control System has proven itself in countless plants worldwide. It's a true all-rounder and convinces with suitable applications for integrated engineering and integrated operation. Its innovative hardware platform opens up new perspectives for a digital future.”

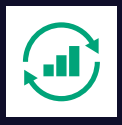
Time-to-market
Seamless data integration transfer from process design to plant engineering

Quality
Designed and built to meet the rigid requirements of the automation market

Costs
Templates and libraries ensure consistency and reduce costs

Cybersecurity
Ensures system’s integrity through built-in safety-certified security features

Increased Flexibility
Scalable from small to large projects



Operational Efficiency
Asset management tools ensure lower maintenance costs

Increased Productivity
System reliability and redundancy reduce unplanned downtime

Content

Integrated plant automation engineering

The bridge between engineering and automation

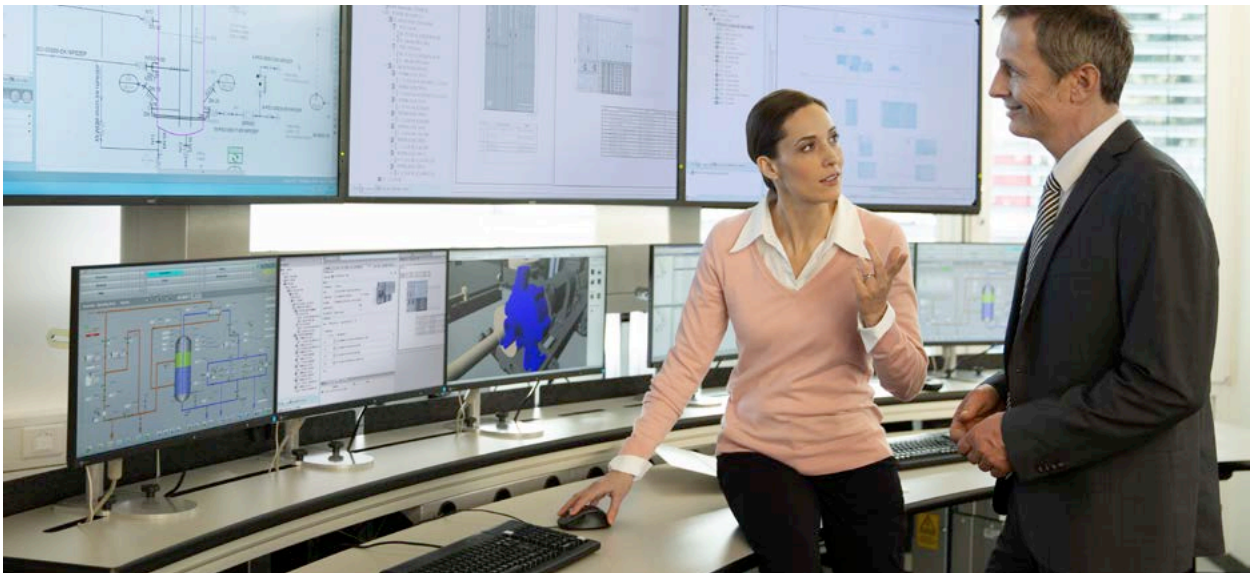
The variety of involved parties, interfaces, and data formats makes engineering a process plant a challenge. System discontinuities, for instance, can lead to transmission errors, which require time- and cost-intensive manual reworking. SIMATIC PCS 7 Plant Automation Accelerator (PAA) builds the bridge between engineering and automation – for consistent engineering between automation planning and the SIMATIC PCS 7 control system.

Modular engineering optimizes project costs

The PAA is a fully integrated solution for seamless planning. This planning takes place based on a continuous electronic workflow: from bid preparation and automatically generated control technology data from electrical planning to the as-is documentation of process automation. This modular engineering approach increases overall project efficiency and reduces costs for project planning and commissioning. PAA allows for maximum flexibility – you can even import electrical designs from other providers' planning tools.

Efficiency from commissioning to plant extension

PAA enables consistent and simple data synchronization between engineering and automation. This increases engineering efficiency and creates cost advantages over the plant's entire lifecycle: from the factory acceptance test (FAT) and commissioning to the consistent as-is documentation of software and hardware. For migrations, plant extensions, and new installations, you can build upon existing planning data and hardware configurations.



SIMATIC PCS 7 PAA allows for error-free data transmission through central data management.

Engineering System

Many disciplines – one Engineering System

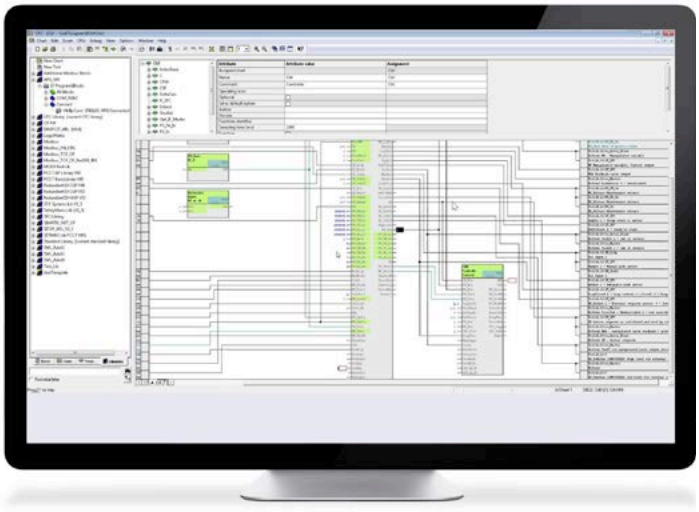
The SIMATIC PCS 7 Engineering System provides a consistent basis for project planning and allows for the various engineering disciplines to cooperate in harmonized, graphic-based tools. The central project manager SIMATIC MANAGER serves as the integration platform from which process engineers, automation engineers, and instrumentation engineers enter into their respective application. Enabling project engineers or teams to work together on a project substantially shortens the engineering phase.

Engineering – secure, consistent, and intuitive

SIMATIC Logon restricts access to the engineering environment to authorized users, protects know-how, and meets industry-specific requirements. The Version Cross Manager reveals differences between versions of a project, while the Logic Matrix allows you to configure interlocking functions (interlocks) in an intuitive cause-and-effect matrix. The Engineering System can easily be adapted to fit different plant structures and project scales – from local installations to complex integrated solutions.

CMT for faster engineering

Control Module Types (CMTs) accelerate plant engineering and the implementation of technical changes. The pre-assembled function modules represent process equipment and can be combined into a standardized sequence control with the Continuous Function Chart (CFC). Discontinuous production processes, however, are modeled in Sequential Function Charts (SFCs). The modules can comfortably be retrieved from libraries.



The SIMATIC PCS 7 Engineering System features proven function modules and graphic-based operation for highest efficiency.

Libraries

Function modules from system and technology libraries

Expand your SIMATIC PCS 7 and precisely adjust the control system to the demands of your industry by making use of function modules. Dedicated modules facilitate operator interaction with the plant and lay the groundwork for condition monitoring of mechanical assets. The modules are arranged in well-structured libraries.

Advanced Process Library – easy project planning and process control

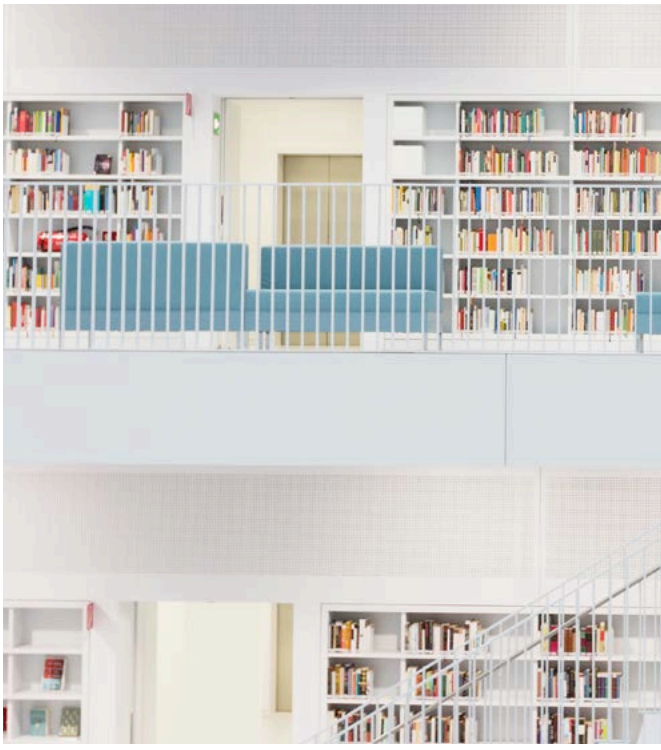
The Advanced Process Library (APL) includes standardized modules for process control and visualization. Function modules, e.g., for the control logic, motors, and field devices, simplify the graphics-based control of process components and optimize visualization of the process status. Accelerated troubleshooting is made possible through APL features, like advanced alarm management options, meaning devices can resume operation within a short space of time.

APL modules enable a quick and structured engineering and make your control system ready for the future. In the case of an upgrade, they retain their full functionality.

Condition Monitoring Library – monitor assets, plan maintenance

APL comes with a Condition Monitoring Library, which contains function modules for monitoring and analysis of mechanical assets. These allow you to detect damage early on and set the stage for predictive maintenance, resulting in an increase of plant availability and simultaneously reducing service costs.

SIMATIC PCS 7 includes the APL as a standard feature. Beyond that, the add-ons Industry Library and Advanced Process Graphics (APG) provide additional resources to further expand the standard functionality of your distributed control system.

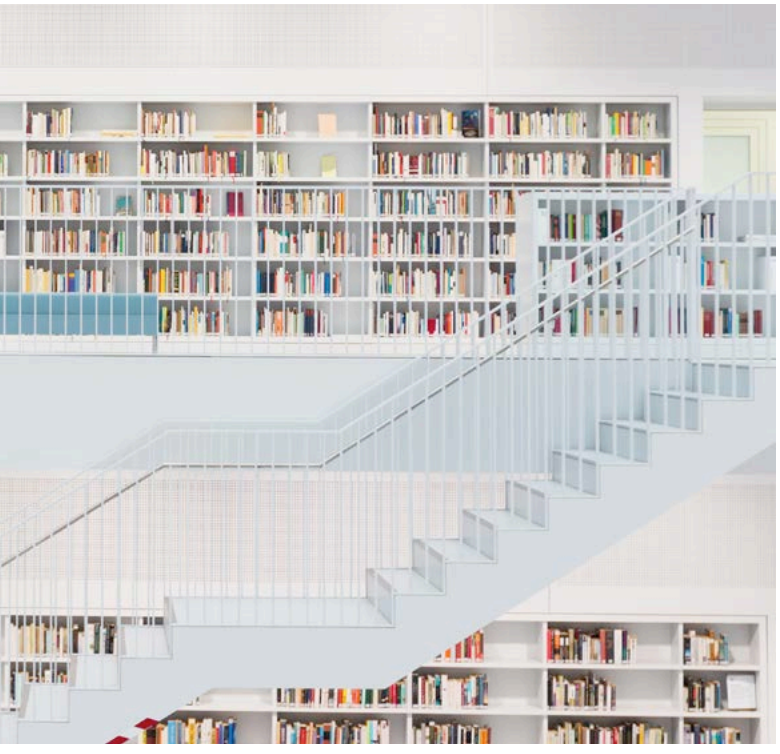


Organization is half the battle – thanks to the transparent structure of the library, you'll find the function module you're looking for in no time.

Industry Library – technology modules for every demand

Adapt SIMATIC PCS 7 to your demands with industry-specific technology modules from the Industry Library. The available modules reflect the entire range of applications that are served by SIMATIC PCS 7: from the food industry to chemicals and pharmaceuticals as well as water/wastewater.

With modules from the Industry Library, SIMATIC S7 Package Units can be integrated into the control system, while controlling and monitoring is possible via SIMATIC HMI Comfort Panels.



Advanced Process Graphics – insights at first glance

Advanced Process Graphics (APG) enrich process data with context. They provide visualization tools, such as trend curves and spider diagrams, so process deviations can be spotted as soon as possible. APGs reduce the complexity of the HMI and direct the operator's attention to the most important tasks. Rather than a flood of data, the operator is presented with structured information and a swift overview of the plant. The HMI concept in SIMATIC PCS 7 installations visualizes all Key Performance Indicators (KPIs) on overview monitors.

Consistent look and feel

Modules from the Industry Library and Advanced Process Graphics follow the design and operating philosophy of the Advanced Process Library. This accelerates engineering, prevents operating errors, and makes process control consistent from on-site operating panels to the central control room.

Virtual commissioning and operator training

Cleverly combined: testing and training of automation projects

Integrated engineering workflows as well as short conversion and commissioning times are indispensable today. The simulation tool SIMIT enables comprehensive tests of automation applications and offers a reality-based training environment for plant operators prior to the actual commissioning.

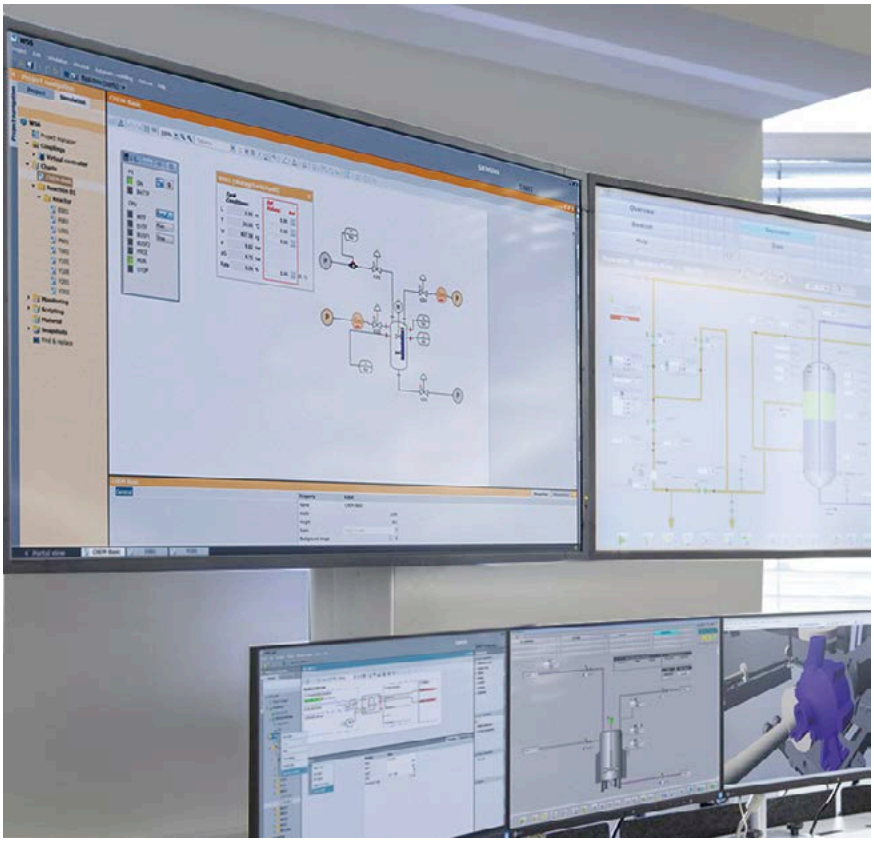
SIMIT allows you to detect potential automation failures before commissioning, making it possible to significantly shorten the time-to-market. This also applies to the implementation of new automation systems as well as the modernization and migration of existing systems.

Simple linkage between simulation and automation environments

The linkage can be established using the real hardware of the automation systems (hardware-in-the-loop) as well as using the integrated virtual controller or SIMATIC S7-PLCSIM Advanced (software-in-the-loop).

Detect errors before the plant is built

After creating the project in the Engineering System, you can test it using SIMIT. The simulation tools highlight potential automation failures and train plant operators using a reality-based environment.



Using SIMIT, you can detect errors early on.

Safety Integrated for optimum process safety

Functional safety in the process industry

Process Safety is not only important because of the variety of regulations to be followed. It is the foundation for the protection of people, plant, and the environment. Functional safety is a significant factor in the process industry apart from plant availability and investment protection.

The failsafe SIMATIC S7 F/FH system includes controllers, bus systems, and I/O periphery as well as instrumentation in a larger sense. The establishment of the standards and safety program takes place in the SIMATIC Manager – with or without SIMATIC PCS 7 – within the CFC editor.

The SIMATIC S7 Safety Matrix is available for additional comfort and more efficiency during engineering, operation, and observation. This allows you to benefit from significantly reduced training expenses and efficient engineering.

Functional safety integrated seamlessly
Our scalable safety portfolio follows a holistic approach and enables different configurations: customized individual solutions as well as system solutions completely integrated into the SIMATIC PCS 7 control system.

More information on functional safety can be found here:
www.siemens.com/process-safety

The SIMATIC S7 Safety Matrix provides additional comfort and more efficiency.

Plant operation

The ideal interface between operator and process plant

With plants becoming increasingly complex, operators are relied upon for a growing number of tasks. Hence, an operating system that supports them with process control is essential. The SIMATIC PCS 7 Operator System is tailored precisely to the operator's needs: it visualizes the plant status and process parameters in a comprehensive manner and features concise user guidance, ergonomic user interfaces, and comparative trend displays for increased operational efficiency. The SIMATIC PCS 7 Operator System temporarily saves process values and messages/events in an integrated archive system. For permanent archiving, they can be exported to a long-term archive.

Detect, diagnose, and rectify faults even quicker with the SIMATIC PCS 7 Operator System.

When every second counts

In critical process situations, the SIMATIC PCS 7 Operator System allows you to react instantaneously. The alarm management hides irrelevant messages, while the alarm list can be sorted and filtered, for instance, by priority or fault location. The Alarm Help Procedure feature promptly provides the operator with important information, such as alarm priority and reason, maximum reaction time, and recommended measures. These help texts can be set individually for different alarm events. SIMATIC PCS 7 Operator System assists operating personnel in proactively avoiding errors or quickly diagnosing and rectifying them, thereby keeping operation going or getting it back up and running in the shortest possible time.

The entire plant in the palm of your hand

SIMATIC PCS 7 Operator System can be implemented as a single-user or multi-user system with minimal engineering effort. With SIMATIC PCS 7 Web Server, the plant can be monitored and controlled from anywhere using a web browser. This allows the integration of mobile devices with an HTML5-capable browser into the operating system. Secure data communication is provided by SSL certificates and https.

Process data archiving and reporting

Where data becomes insight

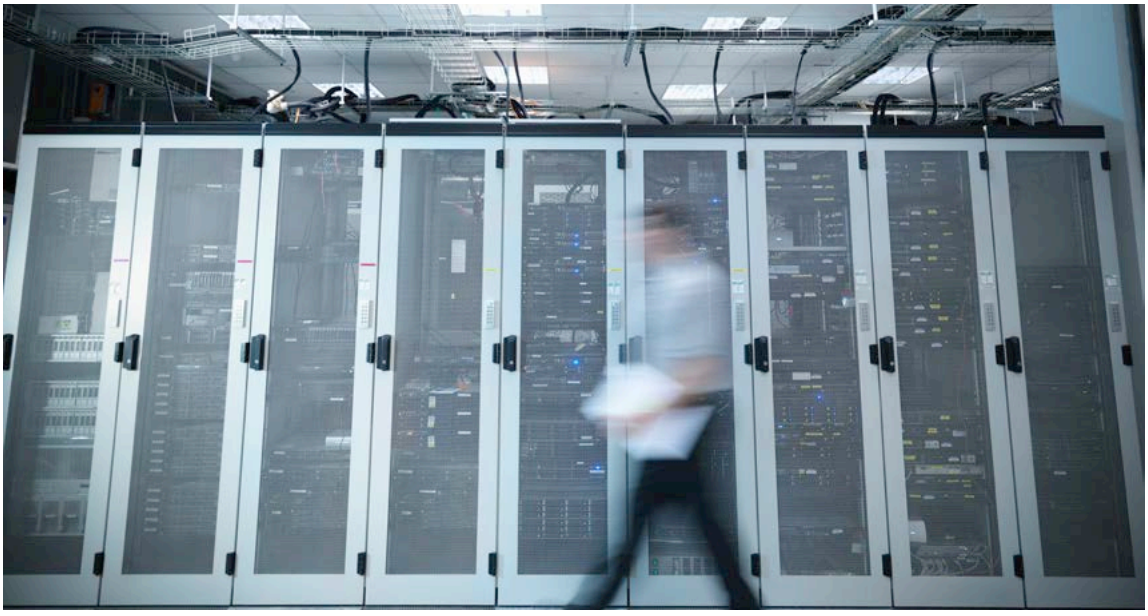
The SIMATIC PCS 7 Process Historian is a powerful archiving and reporting system for scalable real-time data acquisition. Informative reports offer detailed insights into your production plant and reveal potential for efficiency gains. This allows you to increase plant productivity, improve product quality, and lower resource consumption.

The long-term memory of your plant

Modern process plants amass a flood of values, notifications, batch data (e.g., from SIMATIC BATCH), and status information from intelligent field devices. SIMATIC PCS 7 Process Historian captures this real-time data in its entirety and archives it in chronological order. The SIMATIC Process Historian is an open system and supports standard database interfaces, such as ODBC, OLE DB, and ADO.NET. Data can also be exported to commercially available storage media.

Understanding instead of just archiving

The information is visualized with help of the information server. The open reporting system is based on Microsoft Reporting Services and allows combining and condensing data into valuable information, for example, in the form of target group-specific reports. With SIMATIC PCS 7 Process Historian and Information Server, operational process data becomes the foundation for fast, safe, and well-informed decision-making.



A long-term archive solution for large amounts of data is already integrated into the SIMATIC PCS 7 Process Historian.

Plant Device Management

Harness intelligence from the field

In complex plants, varying communication types and network transitions between bus systems make condition monitoring a challenge. SIMATIC Plant Device Management (PDM) was developed to face up to these issues and enables the seamless integration of diagnostic information from intelligent field devices into the control or maintenance system.

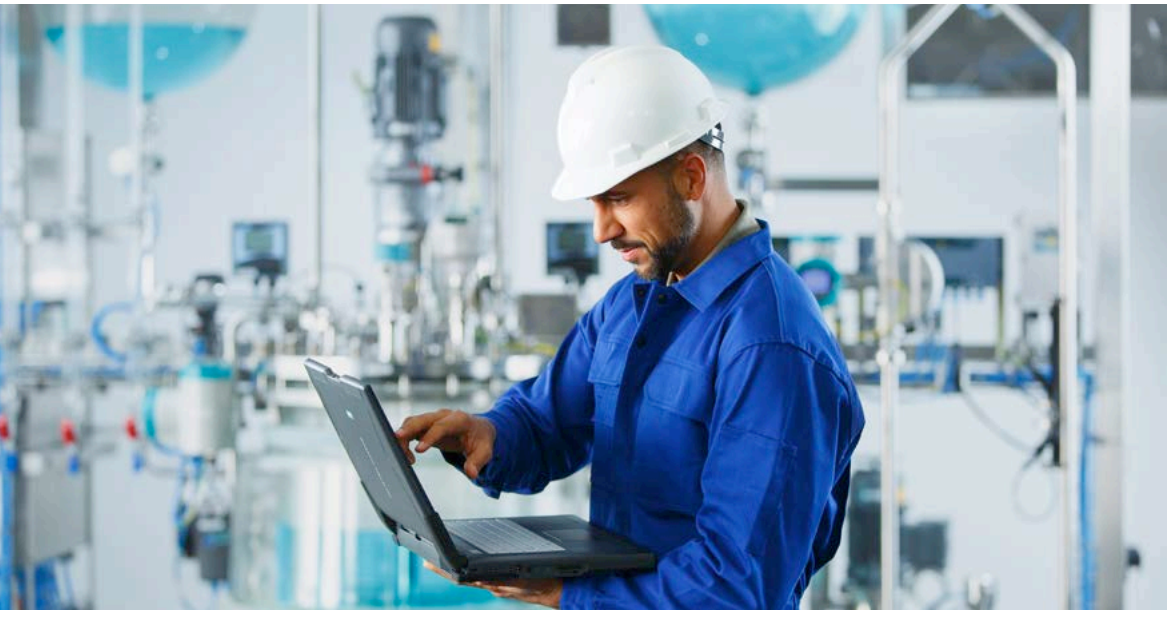
Utilize plant data to predict maintenance requirements

SIMATIC PDM simplifies the parameterization, commissioning, diagnosis, and service of intelligent field devices. It cyclically records diagnosis and status data and displays them in a uniform way for the entire plant. The data can also be transmitted to cloud-based condition monitoring systems. By making device conditions transparent, SIMATIC PDM lays the groundwork for predictive maintenance concepts and helps increase plant availability.

Countless field devices – one user interface

With SIMATIC PDM's uniform user interface, even devices with several hundred parameters can be edited in a quick and structured manner. The software visualizes field devices from more than 200 manufacturers in a single software environment and comes future-proof: devices that are not yet supported can be imported via their device description packages (EDD or FDI). Additional features, such as device-neutral project engineering and bulk operation functions, reduce commissioning times significantly.

Stand-alone variants, like SIMATIC PDM Maintenance Station, are used for monitoring and maintenance of smart field devices, while SIMATIC Plant Asset Maintenance Station captures diagnostic messages of package units.



In SIMATIC PDM, you can switch views as you like, for example, between network view and plant view.

Batch automation

Discontinuous process – consistent product quality

High quality and product variety, short product lifecycles, as well as increasingly strict standards and control requirements – SIMATIC BATCH supports plant operators in meeting the many demands of batch production. The freely scalable software package works with recipe support and allows for cost-effective and standard-conformant batch automation.

SIMATIC BATCH is the central platform for efficient batch automation – and it is fully integrated in SIMATIC PCS 7.

Optimize plant utilization with BatchCC

The SIMATIC BATCH recipe editor offers a graphical user interface, process-oriented operation, and structural syntax checking so recipes and library operations can be created as intuitively as possible. SIMATIC BATCH Batch Control Center (BatchCC) is the central platform for administration, monitoring, and control of batch processes. BatchCC allows planning production orders in advance, interlinking batches, and reveals occupancy conflicts while logging every operator intervention. Differentiated allocation strategies for subsystems allow you to maximize plant utilization, increase productivity, and minimize energy costs.

Compliant documentation, batch by batch

SIMATIC BATCH supports the FDA-compliant validation of your production process. It includes a range of functionalities in accordance with GMP (Good Manufacturing Practice) and complies with ISA88. Recipes and batch data are documented in form of logs with SIMATIC BATCH report.

The configuration of SIMATIC BATCH can be extended at any time so that plant construction can be carried out in several stages according to individual operational planning. SIMATIC BATCH is also fully integrated in the visualization and the Engineering System of SIMATIC PCS 7. Plant data, for example, can be conveniently configured via the Engineering System.

Route Control

Easy navigation for complex pipeline networks

Extend your SIMATIC PCS 7 with the automated route management SIMATIC Route Control for the transport of liquids and solid materials in pipeline networks or on conveyor belts. The industry-neutral program package can be scaled according to your needs: from simple transports to complex route networks with branched pipeline routes, extensive tank farms, material transports running simultaneously, and frequent modifications to the route network.

The relevant route always right in front of you
Using the data from the configuration database, SIMATIC Route Control calculates the ideal route between source and destination points within the plant. To avoid routing errors, this information is augmented with relevant runtime data from the automation system. SIMATIC Route Control takes into account material compatibilities to prevent contamination. It also supports complex route combinations, like blending (mixing of materials) and cascade or parallel transfers. Monitoring of the route activities in progress ensures a safe and efficient material transport to maintain the productivity of the plant.

Reliable routing even in existing plants
SIMATIC Route Control blends into the engineering of SIMATIC PCS 7, which leads to significant savings when it comes to commissioning. When a change to the plant is planned, changes to the existing project planning are generally not required. It works together seamlessly with SIMATIC BATCH and can be retrofitted to existing automation projects.

With SIMATIC Route Control you can reduce the effort for project planning and operation of process routes.

Parameter control and material management

Efficiency and traceability from material acceptance to packaging

In many process industries, a wide product range with consistently high product quality is demanded, while relevant values need to be recorded in accordance with the authorities. SIMATIC PCS 7 Advanced Process Functions (AFP) support the automation of batch processes that are mainly characterized by dosing, mixing, and stirring tasks as well as simple recipe structures. The data management system increases flexibility, transparency, and traceability of these production processes.

Five modules, countless advantages

SIMATIC PCS 7 Advanced Process Functions extend the distributed control system by five function modules. Material management allows creating, modifying, and deleting material master data and material lots. Parameter management enables editing of the parameter sets and provides an interface for data transfer and data synchronization. Order management facilitates simple and secure order control and enables flexible job management. Using the storage location management, operators can find and coordinate storage locations, book materials in and out, and compare set points with actual values. In archive management, archive data records are created and can be exported automatically and time-controlled.

The modules of SIMATIC PCS 7 Advanced Process Functions enhance project planning and production efficiency in small and medium-sized plants. Engineering and operation are consistent across all modules, which is reflected in shorter commissioning times and higher operational safety.

SIMATIC PCS 7 Advanced Process Functions were specifically developed for the requirements of the chemical as well as the food and beverage industry.

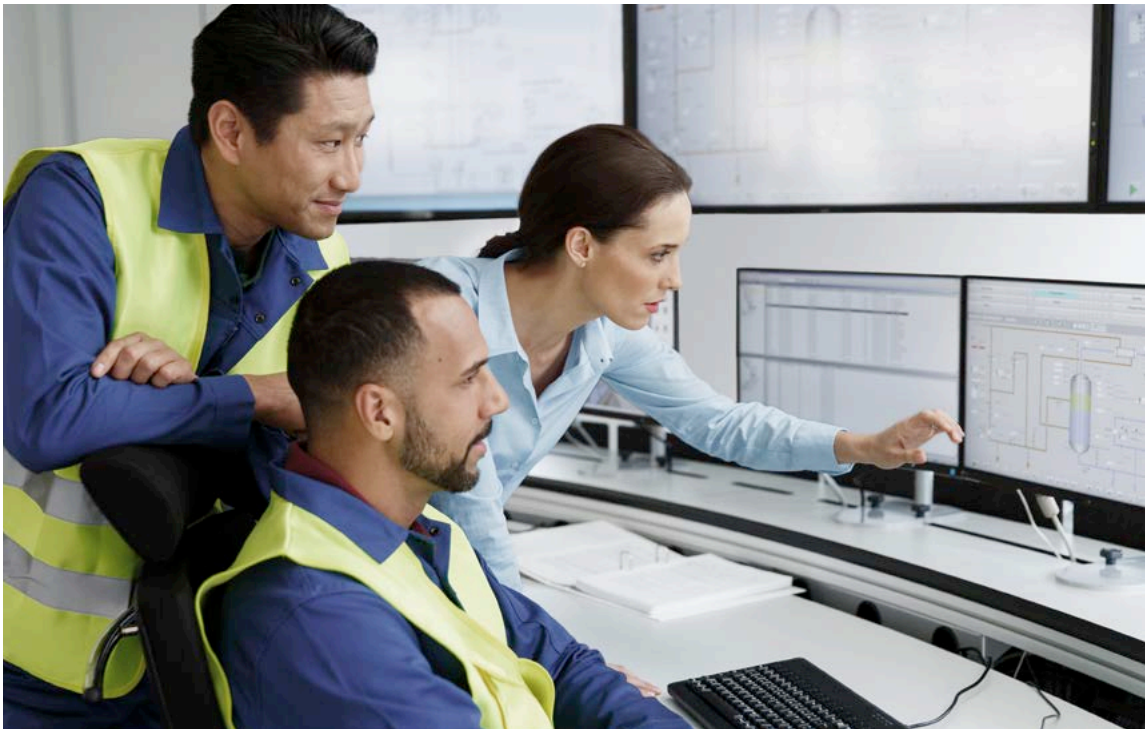
Switchgear automation

Process and energy – two worlds merge

SIMATIC PCS 7 PowerControl smoothly integrates the process plant's medium-voltage switchgear into SIMATIC PCS 7. The result is a uniform system platform for monitoring and controlling both the switchgear and the process automation. Switchgear automation with SIMATIC PCS 7 PowerControl can be scaled to fit any application: from the simple visualization of protection devices to the integration of large electrical loads.

Manufacturer-neutral integration of IEDs

Intelligent electronic devices (IEDs) are used in switchgear to protect, control, and monitor the electrical power distribution. SIMATIC PCS 7 PowerControl integrates these IEDs into the distributed control system via TCP/IP communication according to IEC 61850. The internationally recognized standard supports interoperability between devices from different manufacturers, paving the way for long-term investment protection. For maximum system openness, SIMATIC PCS 7 PowerControl also supports PROFIBUS and PROFINET. New IEDs can be integrated comfortably by means of their IEC 61850 Device Description (ICD). PowerControl's faceplates and operating philosophy are in tune with SIMATIC PCS 7's operating system. Thus, operators who are familiar with the operator system will intuitively find their way in SIMATIC PCS 7 PowerControl and operate the system safely.



SIMATIC PCS 7 PowerControl gives you the possibility to monitor and control switchgear and process automation via the same system platform.

Remote control

Where distances shrink, new worlds open up

In sectors like energy, transportation, water/wastewater, or oil and gas, plants often extend over vast areas. This makes safe and economical access to remote stations a challenge. SIMATIC PCS 7 TeleControl enables the integration of remote terminal units (RTUs) from these stations directly into the distributed control system. A superimposed network control system, which many conventional solutions use as an integration level, is no longer required.

SIMATIC modules for TeleControl support protocols, such as SINAUT ST7, IEC 60870-5-101/104, and DNP3.

Expand the effective range of SIMATIC PCS 7

SIMATIC PCS 7 TeleControl provides a comprehensive overview of the entire plant, allowing you to monitor and control even the most remote process areas. With consistent operator guidance, convenient data management, and continuous engineering, SIMATIC PCS 7 TeleControl seamlessly blends into an existing SIMATIC ecosystem. In terms of operating philosophy and alarm behavior, the operator does not notice any difference between central and remote automation.

Secure communication via various media

The control center is interconnected with the remote stations via Wide Area Network (WAN). When selecting the transmission network, TeleControl offers a variety of options, including leased lines (copper wire and fiber optic cable), Industrial Wireless LAN, and public internet or mobile phone networks. Integrated security measures ensure that data transmission is secure and without losses, while adherence to international communication standards results in optimal investment protection. Existing RTU infrastructure can be integrated smoothly into a SIMATIC PCS 7 TeleControl solution.

Production management level integration

Vertical integration for a deep dive into data

Merging of the process control level with higher levels, such as the ERP system (Enterprise Resource Planning), is becoming increasingly important to optimize operational processes. SIMATIC PCS 7 facilitates the vertical integration of process automation, the operation level, and the company management level by means of OpenPCS 7.

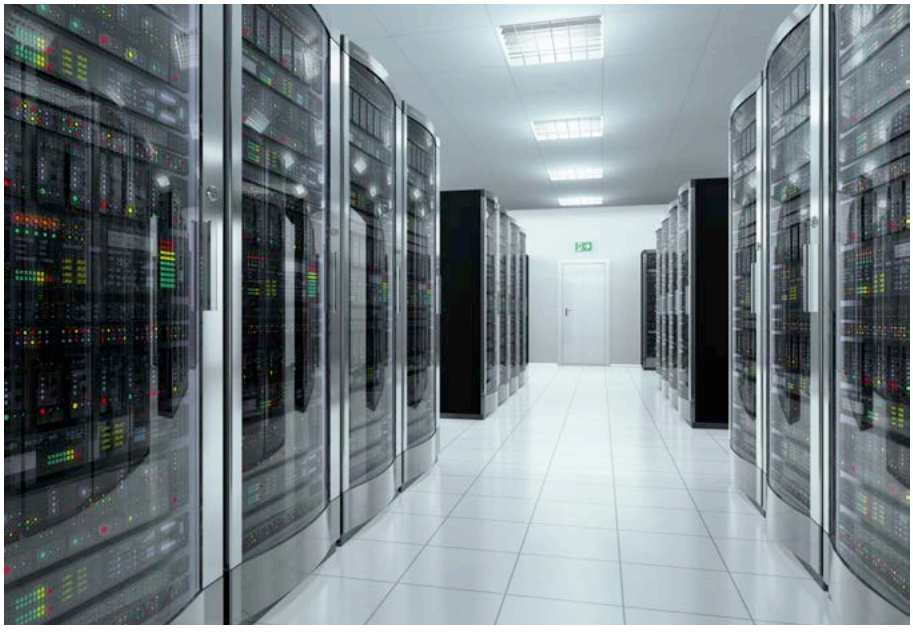
Get more out of your process data

The evaluation of process data in Manufacturing Execution Systems (MES) and Manufacturing Operations Management (MOM) systems is an important lever for process optimization. SIMATIC IT and Siemens Opcenter offer fitting solutions for these demands. With SIMATIC PCS 7's OpenPCS 7 server, process data is easily shared with higher-level systems. In these systems, data, such as process values and alarms, lays the foundation for production planning, management, and evaluation.

Communication takes place via the manufacturer-neutral OPC standard, which also allows third-party applications to access process data from SIMATIC PCS 7. The access by third-party applications is also facilitated by the WinCC OLE DB database mechanism.

Learning from the past for future optimizations

Historical data can be a key to production growth. OpenPCS 7 features multiple aggregate and filter functions for clear and targeted access to historical data. It enables maximum transparency from the process data of your SIMATIC PCS 7, thereby creating a basis for well-informed business decision-making.



Consistent vertical integration with SIMATIC PCS 7

Cybersecurity for industry

Protected in every aspect

To protect industry facilities against internal and external cyberattacks, the approach needs to cover many levels – from the demilitarized level to the field level and from access control to secure data transmission.

With "Defense in Depth", Siemens provides a multi-layer security concept that gives plants comprehensive and extensive protection. It covers plant security, network security, and system integrity as recommended by the international standard IEC 62443 for industrial cybersecurity.

TÜV SÜD certification based on IEC 62443

For product certification according to IEC 62443-4-1 and 62443-3-3, TÜV SÜD tested and confirmed the security functions implemented in the SIMATIC PCS 7 distributed control system. Additionally, the conformity of development and integration processes was also verified.

Forceful against cyber threats

Securing system integrity means protecting control systems like SIMATIC PCS 7 against unauthorized access or securing the know-how contained therein. It comprises user authentication and their access rights as well as system hardening against attacks in the framework of Defense in Depth.

More information on solutions for cybersecurity can be found here:
www.siemens.com/industrial-security

Defense in Depth provides comprehensive and extensive protection for your plant.

Life cycle management

Stay up-to-date when your facility changes

The challenges of automation grow continuously. To be able to cope with these challenges, the software in a distributed control system must be kept up-to-date as this is a prerequisite for availability and security. Several easy-to-use tools and services are available to carry out life cycle management of your SIMATIC PCS 7 system. This allows you to inventory your facility, manage licenses, and keep the software up-to-date. The newest version of SIMATIC PCS 7 paves the way to a completely web-based SIMATIC PCS neo control system. Both systems are based on the same innovative and robust hardware platform and have a uniform system architecture, meaning you can change whenever it suits you.

Stay up-to-date

A Software Update Service (SUS) contract means you will receive all updates (new full software versions, updates, service packs) over the entire lifetime. Hence, your software will always be up-to-date.

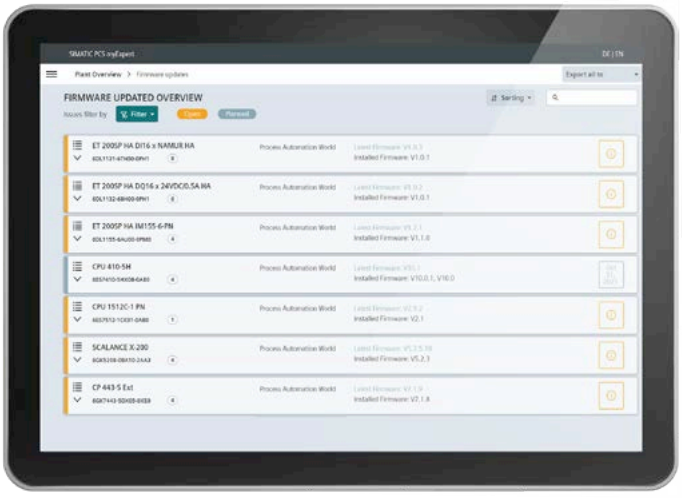
Regardless of time and place you can download your software, corresponding certificates, and license keys from the OSD platform. It also facilitates fast and simple management of your Software Update Service contracts.

Update centrally, well-structured, and efficiently!

The SIMATIC Management Console supports your inventory, planning and compatibility, management, and installation (roll-out). This gives you an overview over the current state of your facility and its components, and it allows you to determine the need for updates according to ascertained inventory data.

System state and life cycle dashboard

SIMATIC PCS myExpert is a web-based application that unifies, clearly presents, and monitors the system state for all SIMATIC PCS 7 installations based on data from the SIMATIC Management Console.



The system administration provides you with an overall perspective of the system components across all levels of the SIMATIC PCS 7 plant.

Migration and upgrade

Benefit from our experience

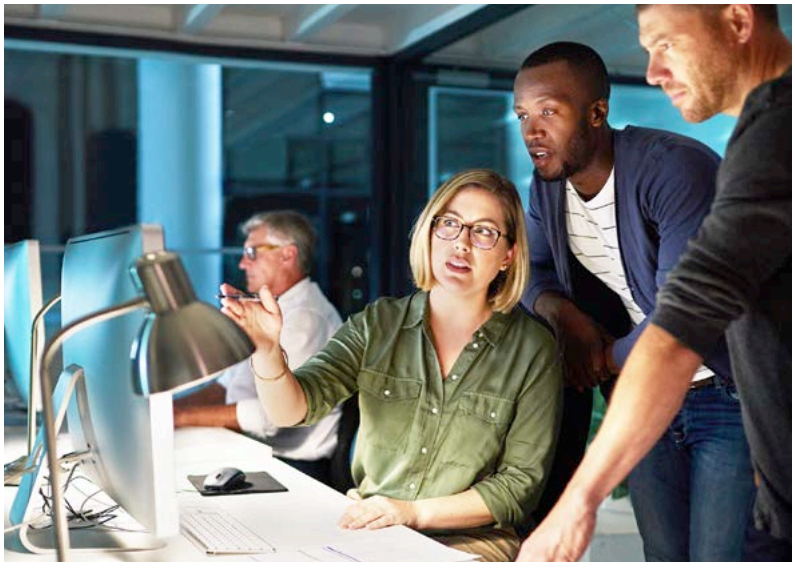
What can you do when the facility needs to be modernized or the lead system is no longer actively supported?

We offer an extensive portfolio of migration and upgrade services so you can operate your distributed control system efficiently and safely in the long run.

We facilitate migration of predecessor and 3rd party systems

As our partner you do not have to cope with the system migration by yourself. Together we elaborate individual strategies that support the modernization and unification of your system landscape. This also applies to old systems of different vendors.

You decide if you want to modernize your plant step-by-step or completely. Several different migration scenarios are conceivable: the comfortable modernization of the existing operating system, the replacement of older controllers with modern SIMATIC PCS 7 controllers, or the simple and flexible exchange to optimized I/O modules.



Benefit from our experience in the migration and modernization of plants.

Up-to-date again with a SIMATIC PCS 7 upgrade

We continuously develop SIMATIC PCS 7 to ensure compatibility with current operating systems. You can close security gaps by upgrading to the newest version of SIMATIC PCS 7. When upgrading the control system of older SIMATIC PCS 7 versions without support, you can benefit from our special and semiautomatic upgrade solutions where existing values like libraries and engineering data as well as licenses are maintained or converted. For components with the status “obsolete” we offer the Legacy System Services (LSS). This guarantees provision during upgrade measures. It provides the necessary space for planning and implementation of pending modernization measures.

A migration or an update provides optimum protection against cyberattacks and ensures plant availability. Benefit from the newest innovations and reduced costs for spare parts stock and maintenance.

With SIMATIC PCS 7 Lifecycle Services, you have a powerful service program for the lead system SIMATIC PCS 7 at your disposal. More information on solutions for upgrades can be found here: **www.siemens.com/upgrade-factory**

Controller integration

Easy and open third-party integration

Process control systems constantly evolve. This presents operators with the challenge to combine components of different manufacturers. Plant expansions, the merging of two control desks, or the step-by-step migration of existing plants may require different types of controllers to be integrated into a single HMI system.

Integrating controllers

SIMATIC PCS 7 OPEN OS supports you in this effort. The expansion for the SIMATIC PCS 7 Operator System facilitates the integration of three controllers: third-party controllers of control systems (DCS), programmable logic controllers (PLCs) from other manufacturers, and package units. At the heart of SIMATIC PCS 7 OPEN OS is the Database Automation Tool (DBA), which defines the interfaces and integrates the various controllers into the operator station of SIMATIC PCS 7.

Connection to operator system via OPC and WinCC

Depending on the technical situation of the controller to be integrated, connection to the SIMATIC PCS 7 OPEN OS Operator Station (single station, server, or redundant pair of servers) is possible via OPC (OPC DA and OPC A&E) or the existing WinCC channels (e.g., S7 channel or Modbus TCP channel). In case of communication via OPC, the OPC server can be executed on separate hardware or together with the OPC client on the SIMATIC PCS 7 OPEN OS operator station. The Engineering System of the controller can also be used to configure the automation functions.

SIMATIC PCS 7 OPEN OS enables the integration of different types of controllers into the operating and monitoring system.

Industrial communication

PROFINET – digitalization begins on the field level

Widely distributed plants, data transfer in real time, and communication in hazardous areas – the process industry places special demands on communication solutions. With SIMATIC PCS 7, we fully rely on PROFINET to meet these demands. With PROFINET you can realize flexible, high-performance, and secure plant networks from the field to the management level.

Hard real-time for time-sensitive networking

By virtue of its openness, scalability, flexibility, and vendor neutrality, PROFINET has emerged as the world's leading Industrial Ethernet standard. In particular, its hard real-time capability and support for deterministic communication make PROFINET an enabler for Industry 4.0. With PROFINET, you can combine IT and OT networks, integrate new communication standards such as OPC UA, and implement applications with time-sensitive networking (TSN). In short: PROFINET is a significant step toward more digitalization and automation in process plants.

Proven. Performant. PROFINET – real-time communication in the field

Maximum availability thanks to Configuration in Run

The components of SIMATIC PCS 7 are connected to the PROFINET network via copper wire or fiber optic cable. Modifications to the network can be made during ongoing operation without affecting the production process (Configuration in Run). Freely scalable redundancies (simple system redundancy S2 and modular system redundancy R1) can be set up precisely according to the application's requirements, thereby exploiting savings potentials. Compared to other standards, the wiring of PROFINET also reduces effort and costs.

Apart from PROFINET, SIMATIC PCS 7 is compatible with all other relevant industrial standards. This allows for manufacturer-independent networking across all levels. SIMATIC PCS 7 with PROFINET is a future-proof solution and offers ideal investment protection.

Extensive ecosystem for high-performance networks

We also provide complementary products for the validation, analysis, and continuous diagnosis of PROFINET networks. PRONETA scans and documents the topology, configuration, and performance parameters of the PROFINET network. Lastly, the SINEC NMS network management system simplifies the monitoring, management, and configuration of industrial networks with tens of thousands of devices.

The Siemens Network Planner SINETPLAN supports you as a planner of automation plants based on PROFINET and facilitates professional and foresighted facility planning – starting with virtual commissioning.

Industrial PCs

Steadfast performance

Industrial PCs (IPCs) are the ideal foundation for automation solutions that are intended to exceed the functionality of traditional controllers. Flexible and long-term available platforms for a digitalized process plant can be realized with SIMATIC Rack IPCs and SIMATIC Microbox IPCs.

SIMATIC Rack IPCs: high performance, thoroughly protected

SIMATIC Rack IPCs combine innovative industrial 19" design with high system performance. The rugged construction as well as the integrated diagnostics and message functions ensure high availability and facilitate maintenance. In SIMATIC IPC647E and SIMATIC IPC847E, Intel processors of the 8th generation provide high performance. From the mainboard manufacturing in Germany to strict shipping guidelines – we set the highest of standards for the quality of our products. This is why SIMATIC Rack IPCs exceed the requirements of CE and UL approvals.

No matter how harsh the conditions in your process plant may be – with SIMATIC Rack IPCs you can rely on market-leading performance and high availability.

With a height of only 2U, the SIMATIC IPC647E uses the available space to the fullest. This Rack IPC is especially suited for industrial server applications and, due to its strong performance, for high-speed computing and visualization tasks, such as image or data processing.

Even higher processing power is made available in the SIMATIC IPC847E. Strong performance, high availability, and the PCI Express technology make it the perfect platform for SCADA systems, image processing for quality inspection, and production-related data processing. You can rely on SIMATIC IPC847E even when it is exposed to high pollution, varying temperatures, or shock. It is also exceptionally well expandable with up to eleven slots.

SIMATIC Microbox IPCs: space-saving client alternative

As a space-saving alternative to SIMATIC Rack IPCs, clients for the operator system or SIMATIC BATCH can also be based on SIMATIC Microbox IPCs. Visualization either takes place via an integrated touch panel (IPC477E) or process monitors connected to the onboard interfaces (IPC427E). Due to their sophisticated design, SIMATIC Microbox IPCs are suitable for maintenance-free, 24-hour continuous operation without the use of fans.

Automation systems

Controllers up to the task

Our field-proven automation systems for the process industry, SIMATIC CPU 410 and SIMATIC S7-400, can be configured flexibly and guarantee long-term investment protection. This allows for automation solutions to be tailored precisely to the application's requirements regarding CPU performance, communication interfaces, fail-safety, and availability.

SIMATIC CPU 410: innovative and highly flexible

With the SIMATIC CPU 410 controller we bring PROFINET to the process industry. With its two Ethernet ports, flexible PROFINET architectures from simple (S1), redundant (S2), and highly available networks (R1) are easily feasible. Thanks to its unique scaling concept, the SIMATIC CPU 410 can be adjusted to the individual automation task at optimal costs.

Thanks to ongoing updates and continuous support, the SIMATIC S7-410 remains a future-proof investment.

Its performance can be scaled according to the number of process objects. The CPU 410-5H is available for each kind of production facility. The controller covers the entire performance range of the conventional automation systems CPU 412 to CPU 417 based on SIMATIC S7-400 and can later grow with the machine. The CPU 410 E is ideal for smaller SIMATIC PCS 7 applications. The controllers ensure highest availability, even in continuous operation and under high stresses from temperature, vibrations, shock, and EMC. Comprehensive security features and certificates make SIMATIC CPU 410 a cornerstone in the effort to defend the plant against cyber threats. Another unique selling proposition of the CPU 410-5H: its flexible use in SIMATIC PCS 7 as well as with the web-based process controll system SIMATIC PCS neo, requiring solely an alternative firmware version.

SIMATIC S7-400: consistent and efficient

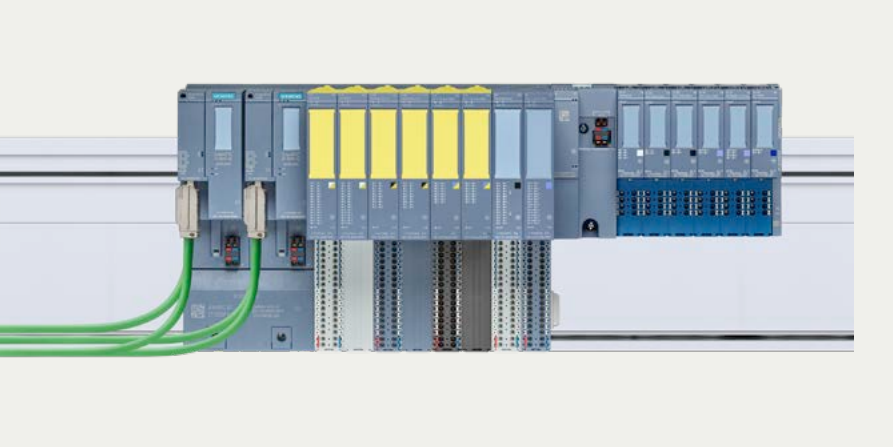
With its high scalability, the SIMATIC S7-400 automation system offers a customized solution for almost every task. The standard systems are first choice when high availability due to redundancy or safety-related functions are irrelevant for the application. The high-availability variant SIMATIC S7-400H practically eliminates downtime, while SIMATIC S7-400F controllers meet the highest demands for fail-safety. In critical situations, SIMATIC S7-400F reconditions your plant into a safe state. Need to combine the features of the SIMATIC S7-400H and SIMATIC S7-400F? SIMATIC S7-400FH controllers provide both high availability and fail-safety.

Distributed I/O

Drive digitalization, protect investments

Our range of I/O products for SIMATIC PCS 7 integrates the periphery in the best way possible for a process periphery made to measure – centrally or decentralized, inside control cabinets, or in harsh industrial environments. Conformal coating and a temperature range from –40 °C to +70 °C mean the distributed I/O can be deployed in the field without worries. This is how you realize a customized distributed I/O. Redundantly designed components, online module exchange, and plant modification during operation using CiR (Configuration in Run) as well as online firmware updates increase plant availability significantly. Planning reliability for up to 30 years and fully compatible successor products protect your investments. Additionally, all modules were developed to reduce efforts for engineering and wiring.

SIMATIC ET 200 for a decentralized periphery
The SIMATIC ET 200 family is ideally suited for a decentralized periphery inside and outside the control cabinet. It can be extended with technology modules, such as inputs/outputs, safety technology, and motor starters. The failsafe I/O modules support the realization of safety functions that transfer the plant to a safe state when required. Additionally, HART AI/AQ modules isolated channel by channel with parallel A/D and D/A conversion ensure rapid signal processing and robustness for guaranteed availability and accuracy of measurements. Intrinsically safe I/O modules in different versions are available for use in potentially explosive areas and applications. Therefore, separate ex-barriers that require complex wiring and a lot of space become unnecessary. The Ex modules can be installed in environments up to ATEX Zone 2 and connected to field devices in environments up to Zone 0 using intrinsically safe circuits. With its great performance density, the highly available SIMATIC ET 200SP HA makes the most of the control cabinet's limited space. With the combination of standard modules, failsafe Ex I/O modules, and technology modules, which are used for particularly fast processes and as vibration protection, SIMATIC ET 200SP HA offers highest flexibility for every area of application. An alternative for use in process applications where dust and explosive gas atmospheres are common is the SIMATIC ET 200iSP.



The SIMATIC ET 200SP HA meets the highest demands for robustness, availability, and flexibility.

SIMATIC CFU – on-site becomes worldwide
SIMATIC Compact Field Units (CFUs) are smart field distributors installed at the process level. They combine a digital fieldbus with conventional I/Os, allowing you to transfer your familiar plant concept into the digital world. The SIMATIC CFU is suited for installation outside the control cabinet and directly in the field up to ATEX Zone 2. SIMATIC CFU simplifies plant expansions and modernizations and reduces the potential for errors during operation.

SIMATIC CFU PA edition

SIMATIC CFU PA combines PROFIBUS PA's ruggedness and ease of use with the advantages of PROFINET. It automatically initializes and integrates up to eight field devices, allowing for Plug-and-Produce in under a minute.

The additional eight freely configurable discrete I/Os round off the application possibilities and also support operating modes, such as "Counter" and "Frequency measurement", for digital inputs. For digital outputs, they support the function "Actuator disconnection", which automatically brings actuators to a safe position when required.

SIMATIC CFU DIQ edition

Digital inputs/outputs usually provide most signals, for example, for reading in feedback contacts or controlling solenoid valves. With 16 freely configurable and discrete I/Os, the SIMATIC CFU DIQ offers the right solution for the field level.

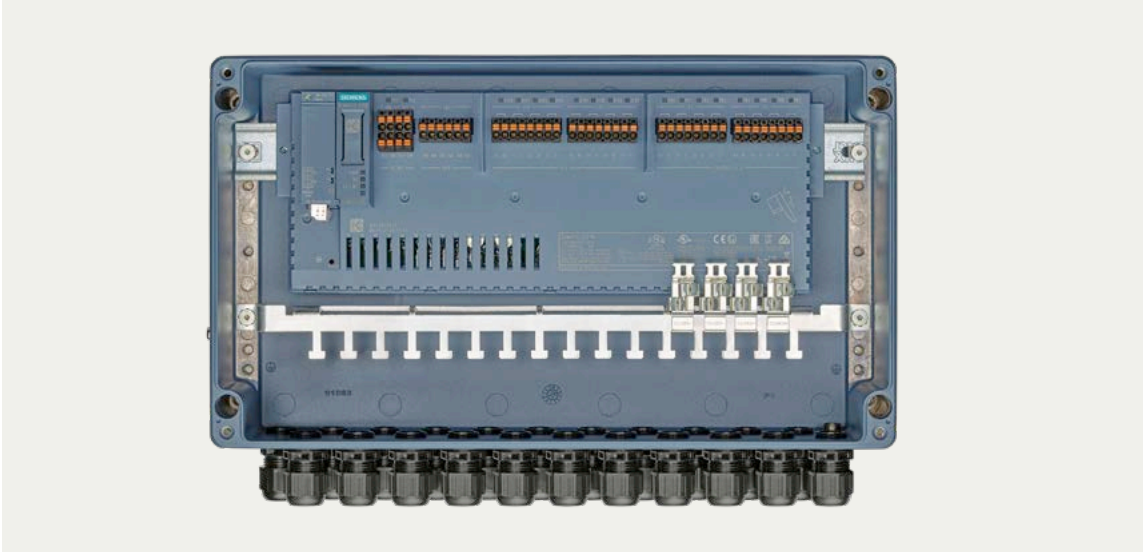
Future technology for digitalization

Further SIMATIC CFU editions are planned, for example,

- PROFIBUS PA intrinsically Safe (PAiS) edition for installation in ATEX Zone 1 and the connection of devices up to ATEX Zone 0
- HART edition with freely configurable analog and discrete I/Os and HART

Seamlessly integrate fieldbus into SIMATIC PCS 7

Products for smooth network transitions are available for conventional fieldbus solutions, e.g., between PROFIBUS DP and PROFIBUS PA. Active field distributors (AFD) even allow adding or removing field devices to or from the fieldbus installation during operation without any adverse reactions, such as short circuits or bouncing. Active field distributors can be operated up to ATEX Zone 1.



Utilize SIMATIC Compact Field Units, e.g., the SIMATIC CFU PA, to carry your familiar plant concept over into the digital world.

Digital assistants

Intuitive tools for efficient processes

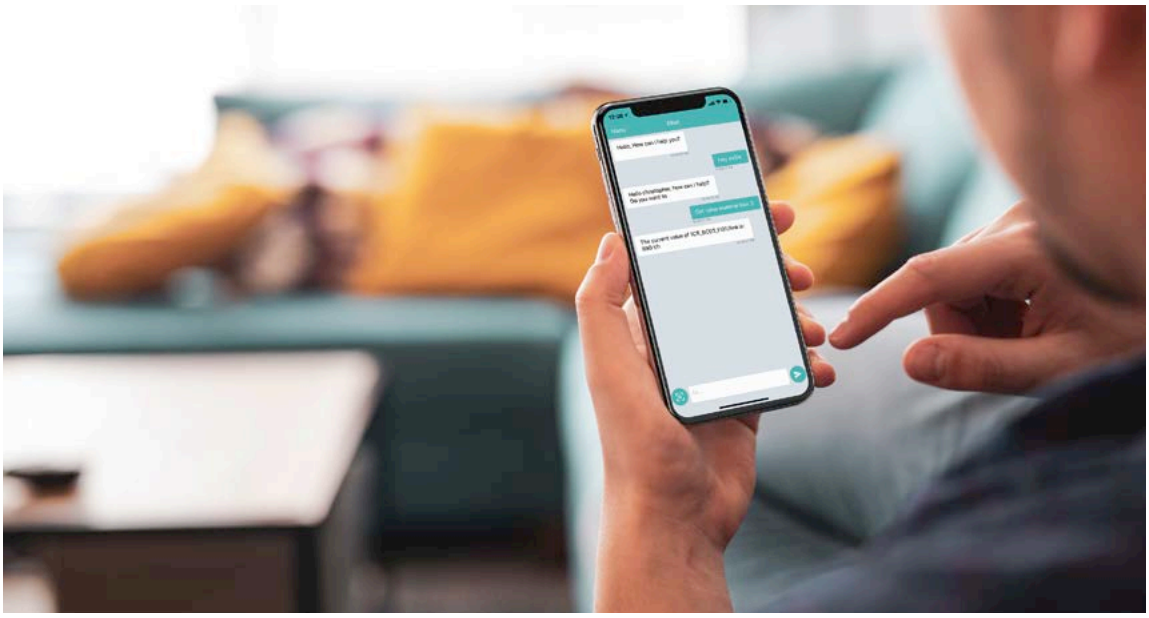
We provide innovative solutions to streamline your processes from component selection to plant operation. The Concept & Design Tool (CDT) helps in the selection of hardware and software, while eaSie brings the human-machine interface of SIMATIC PCS 7 to the next level.

Concept & Design Tool

The Concept & Design Tool (CDT) allows for quick and intuitive assembly of hardware and software for SIMATIC projects and facilitates technical and cost-compliant project planning. It generates a complete, consistent, and ready-to-order bill of material (BOM), which includes individual prices and conditions and can be updated at any time. Customers and projects are clearly assigned, leading to high project transparency and tracking quality. The results from the CDT can then be exported into a professional, detailed quotation.

Process control made by eaSie

Demands on operating personnel are higher than ever: through operational decisions they need to assure product quality, optimize resource usage, and maintain the ideal throughput. The easier the access to relevant process data becomes, the more manageable it is for operating personnel to fulfill their tasks. Our digital assistant SIMATIC eaSie gives operators convenient access to data from the enterprise, manufacturing, and control level. The tool for the process industry enhances the human-machine interface with interaction possibilities, such as chat, QR codes, and voice input. The core element, the eaSie chatbot, is always at the operator's fingertips – through an app for mobile devices.



Via the SIMATIC eaSie digital assistant, operators can enter into dialog with the distributed control system and operate it faster, easier, and more safely.

System documentation

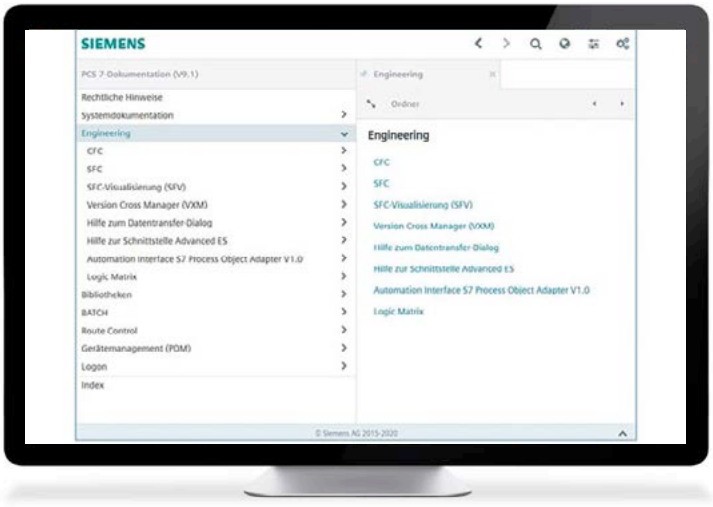
Always informed

Due to a comprehensive documentation, you can easily get familiar with your machine, and important information is always within reach.

Comprehensive, multilingual, online

The SIMATIC PCS 7 system documentation includes the Plant and User Documentation Manager. The documents thereof can be extended individually. Online Readme files contain the latest information. Documents can be downloaded, collected in a library, and newly generated via the complimentary and multilingual My Documentation Manager.

Whether for newcomers or experienced users, the documentation is a helpful resource and includes "Getting started" documentation of exemplary projects as well as descriptions of individual components. The Siemens library in My Documentation Manager also offers access to the technical documentation of other products and systems from the SIMATIC portfolio.



My Documentation Manager provides valuable information for beginners and experienced users alike.

Industry-specific applications

The right control system for your industry

Our integrated industrial applications for electrification, automation, and digitalization allow you to tailor SIMATIC PCS 7 precisely to the needs of your industry. This turns a distributed control system into a competitive advantage. Our industry-specific modules save engineering time, reduce production costs, and streamline production processes. Find out how you can benefit from our industry-specific system solutions.

CEMAT for the cement and mining industry

CEMAT is an enhancement to SIMATIC PCS 7 designed specifically to meet the demands of the cement industry. It has already proven effective in the harsh environments of cement plants around the world. Increased productivity, lower production downtime, optimized energy efficiency, and a boost in process quality are only some of the advantages of CEMAT, which is based on the system platform SIMATIC PCS 7. With its modern, future-proof architecture, SIMATIC PCS 7 is the ideal basis for economical solutions such as CEMAT.

Minerals Automation Standard for the mining industry

Globalization, environmental protection, growing complexity, and rising cost pressure set unprecedented requirements for the mining industry. The Minerals Automation Standard is our answer to these challenges. Based on CEMAT, it combines the functionality for automation of cement plants with typical mining automation application functions.

SIMATIC SIPAT for the pharmaceutical industry

SIMATIC SIPAT combines our know-how in Process Analytical Technology (PAT) and Good Manufacturing Practice (GMP). The industry-specific application extends SIMATIC PCS 7 by numerous tools to support PAT during development and production. SIMATIC SIPAT displays data transparently and intelligently links and interprets it – from process analytics and process control all the way to report generation.

With SIMATIC SIPAT, you can achieve a deeper understanding of the processes in your pharmaceutical plant and can release products faster based upon process data. In short, SIMATIC SIPAT improves processes based on Quality by Design (QbD) and right-first-time testing. After a short time, you can increase system capacity utilization by approximately one-third and reduce production costs by 10 to 20%.

BRAUMAT for the brewing and beverage industry

When it comes to beverage and especially beer consumption, consumers are increasingly trend-conscious. BRAUMAT allows you to quickly adapt to new market developments. It increases plant efficiency from stock receipt to bottling – without having to sacrifice product quality. This strengthens your position in a very demanding market, which is tapped by more and more producers.

BRAUMAT is our control system solution for the effective management of recipe-controlled processes in the beverage industry. The high-precision weighing module SIWAREX FTA ensures correct dosing of malt and hops for an optimal result of the brewing process. Customizable reports reveal insights from process data, while password-protected controllers and encrypted communication ensure security. BRAUMAT is also available in a Lean Edition to meet the specific demands of smaller breweries.

Published by
Siemens AG
Digital Industries
Process Automation
Östliche Rheinbrückenstr. 50
76187 Karlsruhe, Germany

Subject to changes and errors.
Article no. DIPA-B10272-00-7600
Produced in Germany

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