Add-ons for the SIMATIC PCS 7 Process Control System

Catalog ST PCS 7.1 • 2011

SIMATIC PCS 7

Answers for industry.

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## Related catalogs

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SIMATIC PCS 7
Add-ons for the SIMATIC PCS 7 Process Control System

Catalog ST PCS 7.1 · 2011

Supersedes:
Catalog ST PCS 7.1 · 2010

Refer to the Industry Mall for current updates of this catalog:
www.siemens.com/industrymall

The products contained in this catalog can also be found in the Interactive Catalog CA 01.
Order No.:
E86060-D4001-A500-C9

Please contact your local Siemens branch

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Answers for industry.

Siemens Industry answers the challenges in the manufacturing and the process industry as well as in the building automation business. Our drive and automation solutions based on Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) are employed in all kinds of industry. In the manufacturing and the process industry. In industrial as well as in functional buildings.

Siemens offers automation, drive, and low-voltage switching technology as well as industrial software from standard products up to entire industry solutions. The industry software enables our industry customers to optimize the entire value chain – from product design and development through manufacture and sales up to after-sales service. Our electrical and mechanical components offer integrated technologies for the entire drive train – from couplings to gear units, from motors to control and drive solutions for all engineering industries. Our technology platform TIP offers robust solutions for power distribution.

The high quality of our products sets industry-wide benchmarks. High environmental aims are part of our eco-management, and we implement these aims consistently. Right from product design, possible effects on the environment are examined. Hence many of our products and systems are RoHS compliant (Restriction of Hazardous Substances). As a matter of course, our production sites are certified according to DIN EN ISO 14001, but to us, environmental protection also means most efficient utilization of valuable resources. The best example are our energy-efficient drives with energy savings up to 60%.

Check out the opportunities our automation and drive solutions provide. And discover how you can sustainably enhance your competitive edge with us.
Setting standards in productivity and competitiveness.

Totally Integrated Automation.
Thanks to Totally Integrated Automation, Siemens provides an integrated basis for the implementation of customized automation solutions – in all industries from inbound to outbound.

**TIA is characterized by its unique continuity.**

It provides maximum transparency at all levels with reduced interfacing requirements – covering the field level, production control level, up to the corporate management level. With TIA you also profit throughout the complete life cycle of your plant – starting with the initial planning steps through operation up to modernization, where we offer a high measure of investment security resulting from continuity in the further development of our products and from reducing the number of interfaces to a minimum.

**The unique continuity is already a defined characteristic at the development stage of our products and systems.**

The result: maximum interoperability – covering the controller, HMI, drives, up to the process control system. This reduces the complexity of the automation solution in your plant. You will experience this, for example, in the engineering phase of the automation solution in the form of reduced time requirements and cost, or during operation using the continuous diagnostics facilities of Totally Integrated Automation for increasing the availability of your plant.
Integrated power distribution from one source.

Totally Integrated Power.
Electrical power distribution requires integrated solutions. Our answer: Totally Integrated Power (TIP). This includes tools and support for planning and configuration and a complete, optimally harmonized product and system portfolio for integrated power distribution from medium-voltage switchgear right to socket outlets.

The power distribution products and systems can be interfaced to building or industrial automation systems (as part of Total Building Solutions or Totally Integrated Automation) via communication capable circuit breakers and modules, allowing the full potential for optimization that an integrated solution offers to be exploited throughout the product cycle – from planning right through to installation and operation.

Thanks to a comprehensive energy management system, power flows can be made transparent and the energy consumption of individual loads can be calculated and allocated. Building operators can thus identify power-intensive loads and implement effective optimization measures. With its products and systems, Totally Integrated Power forms the basis for this functionality and guarantees greater cost-efficiency in industrial applications, infrastructure and buildings.
Add-ons for SIMATIC PCS 7.

As an important component of Totally Integrated Automation (TIA), the SIMATIC PCS 7 process control system is integrated seamlessly in a comprehensive range of perfectly matched products, systems, and solutions for all hierarchy levels of industrial automation - from the enterprise management level, to the control level, all the way down to the field level. Thus the complete process chain at a production location can be automated, and not just the actual production process - from the inbound logistics (material supply), through the primary process and downstream secondary processes (filling, packaging), down to the outbound logistics (storage).

The exceptionally powerful and versatile SIMATIC PCS 7 process control system is an ideal basis for the cost-effective implementation and efficient operation of control systems. Its functionality can be expanded through the seamless integration of technology components for specific automation tasks.

Uniformity, modularity, flexibility, scalability, and the openness of SIMATIC PCS 7 additionally provide optimal prerequisites for integrating supplementary components and solutions into the process control system in an applicative manner and thus extend and round off its functionality.

Since SIMATIC PCS 7 was launched on the market, we at Siemens as well as our external partners have developed a wide range of supplementary components which we refer to in short as PCS 7 add-on products.

PCS 7 add-on products are software packages and hardware components that are optimally adapted to the respective application and, thus, enable cost-effective use of SIMATIC PCS 7 for special automation tasks.

With this catalog, we wish to help you in finding products for your specific task.
Product responsibility, conditions of use

The responsibility for a PCS 7 add-on product generally rests with the appropriate product manager. The address of the product manager can be found in the "More information" section. This gives you direct access to the appropriate specialists.

All SIMATIC PCS 7 add-on products entitle you to worldwide hotline support from our Technical Support center. Information on central technical support as well as contact addresses can be found in the appendix to this catalog under Customer Support; the general terms and conditions apply.

External SIMATIC PCS 7 partners organize the sale and delivery of their products independently. Their own terms and conditions of business and delivery apply. Corresponding information can be obtained from the addresses given in the "More information" section. Siemens AG accepts no liability and offers no warranty for the products of external SIMATIC PCS 7 partner companies.

The catalog contains hyperlinks to the web sites of third party companies. Siemens cannot be held responsible for the contents of these web sites, nor does Siemens adopt these web sites and their contents as their own. You therefore use these links at your own risk. Since Siemens is not responsible for linked contents and information on the web sites of third parties, this information is not checked by Siemens.

Pricing information

Pricing information for the products with Order Nos. in this catalog can be obtained via the interactive CD-ROM Catalog CA 01, the Industry Mall on the Internet, or on request from your local Siemens partner.

Pricing information for the products without an order number can be provided on request by the responsible add-on partners listed under "More information".

Marking for SIMATIC PCS 7 V7

The add-on products offered in this catalog are specified for the SIMATIC PCS 7 Versions 6 and 7. SIMATIC PCS 7 versions up to V5 are no longer supported by this catalog.

The possible application is specified for each product. The information V6 or V7 always refers to all versions 6 or 7. Otherwise the version is explicitly defined, e.g. V6.1.

Products suitable for SIMATIC PCS 7 V7 are additionally identified by the following logo:

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**Selecting**
Find your products in the structure tree, in the new "Bread-crumb" navigation or with the integral search machine with expert functions. Electronic configurators are also integrated into the Mall. Enter the various characteristic values and the appropriate product will be displayed with the relevant order numbers. You can save configurations, load them and reset them to their initial status.

**Ordering**
You can load the products that you have selected in this way into the shopping basket at a click of the mouse. You can create your own templates and you will be informed about the availability of the products in your shopping cart. You can load the completed parts lists directly into Excel or Word.

**Delivery status**
When you have sent the order, you will receive a short e-mail confirmation which you can print out or save. With a click on "Carrier", you will be directly connected to the website of the carrier where you can easily track the delivery status.

**Added value due to additional information**
So you have found your product and want more information about it? In just a few clicks of the mouse, you will arrive at the image data base, manuals and operating instructions. Create your own user documentation with My Documentation Manager. Also available are FAQs, software downloads, certificates and technical data sheets as well as our training programs. In the image database you will find, depending on the product, 2D/3D graphics, dimension drawings and exploded drawings, characteristic curves or circuit diagrams which you can download.

Convinced? We look forward to your visit!
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Overview

The products described here (interfaces and tools) support economic cooperation between SIMATIC PCS 7 including SIMATIC BATCH and the following plant information management systems (PIMS):

- PI System from OSIsoft (PI-PCS 7-CONNECT)
- aspenOne from AspenTech (aspenOne-PCS 7-CONNECT)

A plant information management system is suitable for:

- Short-term and long-term archiving beyond the limits of companies and plants
- Evaluation and presentation of process and production data

The interfaces and tools provide the best possible combination of PI System and aspenOne with SIMATIC PCS 7. They feature high flexibility, performance and safety. They also support redundant systems and archive recovery concepts, e.g. in the event of interferences in a connection.

We can additionally offer tailored, scalable support and services for efficient implementation and maintenance of these interfaces and tools. Information on support and services as well as manufacturer declarations are available on request (for contact address, see "Further information").

Function

**PI-PCS 7-CONNECT**

PI-CONNECT @PCS 7 and PI-CONNECT OPC+ interfaces

PI-CONNECT @PCS 7 and PI-CONNECT OPC+ read the process tags cyclically from SIMATIC PCS 7 and save these in the PI long-term archive.

The two interfaces are operated on a separate interface PC on the terminal bus of the SIMATIC PCS 7 process control system, and support:

- Redundancy functionality of the SIMATIC PCS 7 OS server
- Concurrent time stamp treatment
- Archive recovery
- Failover online (available soon for PI-CONNECT OPC+)

The PI-CONNECT @PCS 7 interface can be used together with SIMATIC PCS 7 V6. It requires the @PCS 7 system interface for communication with SIMATIC PCS 7.

The PI-CONNECT OPC+ interface can be used together with SIMATIC PCS 7 V6 and V7. It can use the following interfaces for communication with SIMATIC PCS 7:

- OpenPCS 7 interface
- OPC interface

**PI-CONNECT ALARM interface**

The PI-CONNECT ALARM interface can be used to transfer messages from the SIMATIC PCS 7 process control system and/or other sources to the PI archive. Since most of the requirements and special features to be considered are project-specific, PI-CONNECT ALARM cannot be offered as a standard product but only as an individual solution based on the standard interface.

PI-CONNECT ALARM can be used together with SIMATIC PCS 7 V6 and V7.
Function (continued)

PI-CONNECT SIMATIC BATCH interface
This interface transmits data from SIMATIC BATCH to the PI batch subsystem. Together with a PI-CONNECT @PCS 7 or PI-CONNECT OPC+ interface, reports and evaluations based on batch data and process data can be implemented in the PI system. Additional functional properties of PI-CONNECT SIMATIC BATCH include:
• Archive recovery
• Support of hierarchical recipes of SIMATIC BATCH
PI-CONNECT SIMATIC BATCH can be used together with SIMATIC BATCH V6 and V7.

PI-CONNECT CONFIG tool
PI-CONNECT CONFIG is able to work together with PI-CONNECT @PCS 7 and PI-CONNECT OPC+, and with the OPC interface of OSIsoft. The tool provides support for effective creation and easy updating of the PI system project for the SIMATIC PCS 7 link. It provides CSV files for importing into the PI configuration database. It can be used equally for initial configuration of the PI system and for tracking of SIMATIC PCS 7 configuration modifications in the PI system.
PI-CONNECT CONFIG can be used together with SIMATIC PCS 7 V6 and V7.

aspenOne-PCS 7-CONNECT

Batch.21-CONNECT SIMATIC BATCH interface
This interface transmits data from SIMATIC BATCH to the Batch.21 system and supports you with functions such as archive recovery. Thus reports and evaluations based on batch data and process data can be implemented in the AspenTech system.
Batch.21 CONNECT SIMATIC BATCH can be used together with SIMATIC BATCH V6 and V7.

IP.21-CONNECT CONFIG tool
IP.21-CONNECT CONFIG provides support for effective creation and easy updating of the IP.21 system project for the SIMATIC PCS 7 link. The tool provides CSV files for importing into the IP.21 configuration database. It can be used equally for initial configuration of the IP.21 system and for tracking of SIMATIC PCS 7 configuration modifications in the IP.21 system.
IP.21-CONNECT CONFIG can be used together with SIMATIC PCS 7 V6 and V7.
As an alternative to the OpenPCS 7 system interface, the SIMATIC PCS 7 can also use the PCS 7 OCS open data interface for data exchange with applications or systems to allow process data evaluation and production planning.

By using PCS 7 OCS, external applications and systems are able to read out configuration and process variables as well as the process value and message archives of the SIMATIC PCS 7 process control system via network. If you also have write privileges, you can additionally transmit data to the process control system via the network, for example, in order to visualize and process the transport orders, production data or inventory data of an ERP system (Enterprise Resource Planning) using SIMATIC PCS 7.

In contrast to the OpenPCS 7 interface based on the OPC specifications (Openness, Productivity, Collaboration), the PCS 7 OCS interface does not use Microsoft COM/DCOM technology for communication between the applications. The platform-independent communication standard ACPLT/KS of PCS 7 OCS allows stable, firewall-compatible TCP/IP communication via a limited number of statically defined network ports.

PCS 7 OCS enables external applications/systems to indirectly find all instances of blocks or variables in the process control system by means of their type and to carry out further selection using filter criteria. This feature can be used to specifically read out a certain group of parameter types or to automatically configure external data recording with automatic adaptation to changes in the configuration of the process control system.

Note:
PCS 7 OCS can be used together with SIMATIC PCS 7 V6 and V7.

Using PCS 7 OCS you can simply link, for example, the following external applications/systems to SIMATIC PCS 7:
- SAP and other ERP systems from the corporate management level
- MES systems for production and corporate management
- PIMS (Plant Information Management Systems) to gather operating data
- Simulation and optimization tools, e.g. for monitoring of controller performance or for application of Advanced Process Control methods
- External database applications for long-term archiving and data analysis for more than a single plant
- Web browser for presentation of production information (online data, message lists, trends)
- Office applications such as Microsoft Excel, for example, for generation of reports
- Process control systems and PLCs from other vendors

The PCS 7 OCS is installed directly on the PCS 7 OS server or the PCS 7/TM-OS server for TELEPERM M migration. Neither additional hardware nor any special configuration of the associated OS server is necessary.

Two PCS 7 OCS licenses are required for connecting redundant third-party systems, one each for the two OS servers of a redundant pair of servers. Identical information is then available in parallel via the two PCS 7 OCS interfaces of this pair of servers.

Powerful PCS 7 OCS communication based on the TCP/IP protocol for data exchange between OS server and application/system is also possible without problems in distributed networks in which the access is limited by means of a firewall.
**Function**

The PCS 7 OCS interface is exceptionally suitable for linking external applications/systems to SIMATIC PCS 7 with the assistance of autoconfiguration functions. A PCS 7 OCS license provides authorization for:

- Reading and writing all variables of an OS server
- Reading process value archives and alarm logs

LeiKon GmbH offers the following standard applications for the SIMATIC PCS 7 connection via PCS 7 OCS in addition to the data interface (see under "More info" for the contact address for detailed information and ordering).

**Additive standard applications from LeiKon GmbH**

- **Web server “Web meets Production”**
  
  The Web server is used to provide individually designed Web pages with which current and historical data of the SIMATIC PCS 7 process control system can be displayed, for example, key performance indicators (KPI), production states or production statistics

- **PIMS and database coupler “KSHistBuilder”**
  
  The KSHistBuilder can be used to cyclically transfer archived or online data from SIMATIC PCS 7 to a standard SQL database. Existing archives are automatically detected and transferred cyclically to the database. Configuration is not required. Brief communication failures do not result in a loss of data. An identical functionality is also available for connecting SIMATIC PCS 7 to standard plant information management systems (PIMS).

- **Microsoft Excel add-in “Excel meets Production”**
  
  With this expansion, process and archive data of SIMATIC PCS 7 can be read manually or cyclically into Microsoft Excel. Format templates can be freely defined.

**Selection and ordering data**

**SIMATIC PCS 7 OCS V3.3**

Open communication server for data exchange between SIMATIC PCS 7 OS server and third-party system/application, executes with SIMATIC PCS 7 V6 (V6.0/V6.1) and V7 (V7.0/V7.1), single license for 1 installation

Engineering software with runtime license for one PCS 7 OS server, one language (German), software class B

Type of delivery: Software and documentation on CD and certificate of license

**Order No.**

6DL5 405-8AD33-0XA0

**On request from LeiKon GmbH**

**Additive standard applications**

for data exchange with the SIMATIC PCS 7 OS server via SIMATIC PCS 7 OCS, e.g.

- Web server "Web meets production"
- PIMS and database coupler "KSHistBuilder"
- Microsoft Excel add-in "Excel meets production"

D: Subject to export regulations AL: N and ECCN: 5D992

**More Information**

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Germany

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Fax: +49 2407 95 17 339
E-mail: contact@leikon.de

www.leikon.de
Overview

The PLSDOC RE documentation updating system is provided for documentation of SIMATIC PCS 7 systems and for support throughout the complete lifecycle.

System support engineers profit from the high availability of information and are provided with support for quality assurance.

PLSDOC RE updates the plant documentation to the current data of the process control system without delay. Any modifications are recorded in change reports.

Information relevant to system support engineers is provided by PLSDOC RE in the form of standardized project documents, e.g.

- IB/FAT reports
- Measuring circuit test reports
- Quantity frameworks
- Repetition reports

System-specific configuration of PLSDOC RE is simple to carry out and is supported by a program wizard.

Note:

PLSDOC RE can be used together with SIMATIC PCS 7 V6 and V7.

Benefits

- Standardized documentation of process objects and step sequences
- Fast and correct comparison of data in process control system and feature specification
  - Changes to customized parameters are completely documented, e.g. limits, control parameters, measuring ranges, interlocking information
- Provision of standardized documents for system configuration and support
- Integration of feature specification into the operator systems
  - Information directly available to support personnel

Function

- PLSDOC RE monitors redundant pairs of servers in the context of documentation updating. Should a server fail, a switch is made to the redundant server.
- The modification information is buffered between the OS server and PLSDOC RE. This means that no modification information is lost before PLSDOC RE can establish a connection to the OS server.
- PLSDOC RE generates HTML documents for every process variable. These documents can be integrated into the process displays for direct calling.
- References to other process variables are made by means of hyperlinks, meaning that direct calling is possible.
- Information on the system peripherals (computer, printer, software licenses, etc.) can also be managed using PLSDOC RE.
- The recording of information independent of process objects is also possible, e.g. information on maintenance work and measures taken in the event of faults.

Technical specifications

System requirements

Application computer:
Microsoft Windows NT4.0 SP6/2000/XP, 512 MB RAM, 100 MB hard disk, Acrobat Reader 5.0 or higher

More information

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ACRON is a product for system optimization, energy monitoring, long-term archiving and logging which supports you for compliance with verification requirements. It was originally designed for special requirements in environmental technology, but has also proven successful in many different sectors for more than 12 years. The high requirements encountered in the water/wastewater/environmental sector (e.g. ATV M260 in Germany) can also be fulfilled with ACRON.

ACRON 7, the current version, offers an exceptional price/performance ratio, and is impressive in operation thanks to high availability, running reliability and data integrity. Simple configuration, easy handling and high flexibility are further exceptional features.

ACRON 7 is scalable from a small single-user system up to a networked client/server system for large applications.

The interfaces of ACRON 7 are matched to the SIMATIC PCS 7 process control system. Certain modules can be integrated as OCX in SIMATIC PCS 7.

ACRON 7 is currently available in English, German and Italian. Note: ACRON 7 can be used together with SIMATIC PCS 7 V6 and V7.

The following modules are components of ACRON 7:

- **Database**: Up to 100 000 data points, time-based or change-dependent recording, arithmetic operations, high performance with resolution in millisecond range, high data security due to TLC (Three Level Cache)
- **Provider**: Data acquisition from any sources with telecontrol link and very high data security
- **Reporter**: Convenient operator interface for printing of reports and logs with input facility for manual laboratory values
- **Graph**: User-friendly presentation and analysis of measured values and statistical values in trends
- **Fault and maintenance module**: Generation of all required fault and message reports as well as comprehensive statistics
- **AC Job**: Administration module for automatic printing of reports including sending by e-mail
- **Data Collect**: Combination of any values from various ACRON applications
- **Microsoft Excel Add-In**: Convenient access to all data
- **AC Mirror**: Up to 8-fold database redundancy
- **ACRON Web**: Web-based analyses and scans can read the complete ACRON database. An ACRON Web client permits reading of all reports and also the graphic display of data.

**More information**

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www.acron7.com
versiondog: Data management for SIMATIC PCS 7

Overview

versiondog is a powerful data management system which supports the complete lifecycle of a SIMATIC PCS 7 system from configuration through commissioning and operation up to modernization. You can use versiondog to administer your projects in a central data storage system with access control, for automatic assignment of versions, and for documentation and comparison.

Smart Compare shows the differences between two versions in a clearly understandable form. Differences between two CFC or SFC charts are marked in color in a graphic comparison. The audit trail of versiondog exactly shows changes, including information on who, when, what and why.

versiondog can automatically verify at regular intervals whether the production is being carried out with the currently released program version and immediately signals any deviations.

The change processes regulated and systemized with versiondog conform with the directives ISO 900x, FDA 21 CFR 11, GxP and VDA 6.4.

Note:
The versiondog data management system can be used together with SIMATIC PCS 7 V6 and V7.

Design

versiondog is extremely easy to integrate in a SIMATIC PCS 7 system. No additional drivers are required, and no special settings or configurations in the SIMATIC PCS 7 project either.

The server for the central data storage is set up on a separate computer. The client, which can also be executed without installation, does not carry out any write operations on Windows directories or read/write operations on the Windows registry. System administration is thus possible from any PC-based station.

Function

Important functions of versiondog in the context of SIMATIC PCS 7:

• Central data storage
  Server-based data storage with clear project structure, user and access management, protected against inadvertent overwriting

• Version management with audit trail of versiondog:
  Version assignment and documentation with logging of all changes as proof of who, when, what and why; visualization of changes by means of comparative graphic display for CFC and SFC

• Smart Compare
  Comparator modules for alignment of different project states with clear representation of differences

• Automatic data saving
  Cyclic, automatic data saving of engineering stations, automation systems and operator stations

• Verification of server version
  Cyclic, automatic comparison of versions between the programs on the productive systems and on the project server for the automation systems of the plant

Application

versiondog can also be used for various functions beyond the limits of the SIMATIC PCS 7 process control system. This is because versiondog can administer all PC-based data and provides additional functionalities for a wide range of different data types - for Adobe PDF, Microsoft Word and Excel as well as for SIMATIC PCS 7, SIMATIC S5, SIMATIC S7, SIMATIC WinCC, SIMATIC WinCC flexible, ProTool or SINUMERIK 840D from Siemens or for systems and applications from other vendors. The comprehensive range is being continuously expanded.

More information

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76829 Landau
Germany
Phone: +49 6341 944 600
Fax: +49 6341 944 611
E-mail: sales@auvesy.de
You can find additional information in the Internet at:
www.versiondog.de
### 3/2 INCA MPC:
Model-predictive multi-variable controller

### 3/3 INCA Sensor:
Soft sensors for non-measurable quality variables

### 3/5 INCA PID Tuner:
Expert tool for the optimization of PID controllers

### 3/6 ADCO: Adaptive controller

### 3/7 MATLAB/SIMULINK-DDE client:
Online coupling for APC

### 3/8 FuzzyControl++:
Configuration tool for fuzzy logic

### 3/10 NeuroSystems:
Configuration tool for neural networks
INCA MPC: Model-predictive multi-variable controller

Overview

Multi-variable controller with integral optimization procedure

Common control concepts in the process industry today are still almost exclusively based on PID controllers and also include manual intervention by the plant operator. In processes with complex dynamics, linked process variables or limitations, PID controllers reach their limit.

If a process is to be operated close to the capacity limit, while at the same time minimizing waste and assuring the required quality, consideration of these precise boundary conditions in the controller strategy is absolutely essential.

Additional weak spots are product or load changes which are generally carried out partly or completely by the plant operator. This causes variations which prevent optimum quality being maintained at all times.

By carefully applying advanced modern control procedures (Advanced Process Control, APC), the process industry has real leverage available for reducing costs and increasing quality. The use of Advanced Process Control extends SIMATIC PCS 7 with the function of ‘process optimization’. This creates a link between the planning and scheduling functions of the execution level and the process control functions of the control level.

Of all the modern control procedures, Model Predictive Control (MPC) has emerged as the most suitable approach in numerous applications. MPC simplifies the handling of complex plant dynamics, permits the early elimination of faults, takes into consideration the plant limitations, and allows complex process control strategies.

INCA MPC

This procedure is also used by INCA MPC, a multi-variable controller of the latest generation. INCA MPC differs from classic MPC controllers due to a series of functional extensions. Modern modeling methods, bumpless switching between different models (multi-model handling), expansions for batch processes, non-linear predictions, and a high quality of control are setting new standards and enable plant-wide optimization as well as the control of non-linear processes.

The INCA MPC (or GlassExpert) software itself runs on a separate PC under the Windows 2000/XP/Vista operating system.

Note:

INCA MPC can be used together with SIMATIC PCS 7 V6 and V7.

Application

INCA MPC for the glass industry

Preconfigured solutions based on INCA MPC are available specifically for the glass industry.

The GlassExpert series currently comprises:
- TubingExpert for dimensioning control of glass tubes
- ProfileExpert for temperature profile control in glass channels
- MeltingExpert for floor and atmosphere temperature control in glass melting ends

INCA MPC for the chemical industry, application examples
- Ammonia, urea, nitric acid, granulates, and phosphoric acid plants
  - Increase in throughput, for example, by up to 2 % for ammonia and up to 5 % for urea
  - Increase in steam export by up to 1 % (ammonia)
  - Reduction in specific energy consumption by up to 1 %
  - Increased plant availability
  - Less sensitive to changes in gas condition
- Polymer plants
  - More flexible operation (faster change of product)
  - Production on request

More information

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Overview

Online determination of quality variables

Production plants in the process industry today rely on regular and very time-consuming laboratory analyses for quality control purposes (new measured values typically every 8 to 24 hours) - or they use very expensive, high-maintenance online analyzers (new values typically every 20 to 60 minutes). In order to raise productivity and run the process up to its full capacity while maintaining the required quality, it is necessary to measure product quality online with a refresh rate of between 0.5 and 3 minutes. This ensures that the controller responds at the right time and the product specifications are maintained.

The weaknesses of previous designs for process control are also reflected in the changes of product quality or production capacity which, as a rule, are performed partly or completely by the plant operator. This results in longer periods in which the production specifications do not comply with the quality requirements, as no quality values are known while the changes are being made.

These problems can be solved by using soft sensors. Soft sensors are calculation procedures which determine non-measurable quality variables on the basis of measurable process values (pressures, flow rates, temperatures, levels, etc.) in cycles of between 0.5 and 3 minutes. The calculation is made on the basis of a (non-)linear parametric model generated from historic plant data or through dedicated tests. The high-speed soft sensor predictions can be consolidated by laboratory analyses or values from online analyzers.

The soft sensor predictions enable the frequency of laboratory analyses and the use of online analyzers to be reduced. They raise product quality while at the same time reducing operating costs.

INCA Sensor is a tool for designing, parameterizing and operating soft sensors. It makes it easier to master complex plant dynamics, and enables operating conditions to be optimized so that the quality of the end product is assured.

Note:
INCA Sensor can be used together with SIMATIC PCS 7 V6 and V7.
**INCA Sensor:**
Soft sensors for non-measurable quality variables

**Application examples**
- Polymer thickness
- Polymer melt-flow index
- Viscosity
- Product concentration at the outlet of reaction or distillation columns
- Plant efficiency/utilization factor
- Gas concentrations (NOx, CO2, etc.)

INCA Sensor sets new standards for the permanent plant-wide optimization and control of non-linear processes. INCA Sensor differs from other soft-sensor program packages due to its series of function expansions that support the designer when drafting reliable soft sensors:
- Modern modeling methods such as linear transmission functions, general non-linear models (GNOMOs) or estimates according to the partial least squares estimators method
- Signal processing or pre-processing (offline and online)
- Powerful tools for selecting suitable input variables
- Input options for data from laboratories and analyzers

Soft sensors are a prerequisite for plant optimization and quality control using advanced process control solutions such as INCA MPC.

The INCA Sensor program package can run on standard PCs with the Windows 2000/XP/Vista operating system. It is linked to the SIMATIC PCS 7 process control system by means of OPC, where INCA Sensor is operated as an OPC client.

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**Overview**

PCS 7 Add-on: fit for SIMATIC PCS 7 V7

The PCS 7 PID Tuner integrated in the CFC enables you to determine the optimum controller parameters in predefined steps for PID, PI and P controls in a control loop.

The PCS 7 PID Tuner can be used for the software controllers CTRL_PID and CTRL_S. The INCA PID Tuner program package, on the other hand, is a controller-independent and manufacturer-independent tool for fast and user-friendly, computer-aided optimization of complex PID controllers. INCA PID Tuner can run on standard PCs with the Windows 2000/XP/Vista operating system. It is linked to the SIMATIC PCS 7 process control system by means of OPC.

As an alternative to online data, files containing data collected earlier can also be evaluated offline. The program package is able to process the following file formats:
- Microsoft Access
- Microsoft Excel
- MATLAB
- INCATest
- All types of ASCII files

INCA PID Tuner contains predefined PID controller structures for PID controller types from SIMATIC PCS 7 and other manufacturers. With the aid of a dynamic process model, the user can determine the optimum controller setting step by step.

**Note:**

INCA PID Tuner can be used together with SIMATIC PCS 7 V6 and V7.

**Function**

INCA PID Tuner differs from other controller optimization software through:

- Optimization of PID control loops on the basis of engineering specifications
- Controller setting for optimum compensation of disturbances
- Controller setting for optimum command behavior with predefined setpoint changes

**Data acquisition**

Collection of process data by means of an online OPC connection to the SIMATIC PCS 7 operator system or from offline files. Many test signals are available for initiating the process, including:

- Setpoint step-change
- Manipulated variable step-change
- Ramps
- Pseudo-disturbance binary signals

**Data preprocessing**

The user can select and filter data to refine the results of the process identification.

**System identification**

A dynamic process model is defined on the basis of the collected process data. Various model structures can be used: with/without dead time and different system arrangements. Users have the option of influencing the system identification on the basis of their knowledge about the process. They can save and compare the resulting process models.

**Controller design**

On the basis of the chosen process model, controller parameters are determined for a certain specification. Consequently, the controller can be designed for optimum command behavior, optimum noise suppression or a combination of both.

**Simulation of the designed controller**

An evaluation of the control loop behavior is possible by simulation within INCA PID Tuner or online via the existing OPC connection. The simulation results obtained with different controller settings can be saved and compared.

Good settings for primary control loops are a prerequisite for subsequent plant optimization, for example, using INCA MPC.

**More information**

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Advanced Process Control

ADCO: Adaptive controller

Overview

Conventional PID controllers are frequently used in manual mode in practice because the control quality achieved does not match the expectations. This is because either the controllers have been poorly set or because the processes are difficult to master using PID controllers, for example, temperature systems, processes with large dead times, or processes which change depending on time or operating point. Optimum setting of PID controllers additionally requires special experience and is very time-consuming.

A recommendable alternative for solving such problems is the adaptive controller ADCO. It works on the basis of a process model which is determined in the background during the adjustment process. Using this process model, ADCO can predict the result of a process intervention (predictive controller), for example, how the opening of a steam valve by a certain amount will affect the process temperature. In the opposite direction, it is also able to determine the valve position required to achieve or retain a defined temperature value. ADCO with the process model has more process information available than conventional controllers, and uses this to improve the control quality.

Application

The adaptive controller ADCO can be used as a better alternative to the conventional PID controller, in particular for processes that are difficult to control. This has the following advantages:

- About 10 to 20% time savings in the commissioning phase due to the fast and rugged controller setting
- Significantly better control quality for difficult processes
- Very good adaptability, especially where there are changes to the process characteristics
- Significant reductions in transmission times in the case of status transitions in batch processes (e.g. heating a product from temperature level A to level B)

Note:
The adaptive controller ADCO can be used together with SIMATIC PCS 7 V6 and V7.

Technical specifications

ADCO

<table>
<thead>
<tr>
<th>Hardware requirements</th>
<th>SIMATIC PCS 7 V5.x or higher with AS 41x automation systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory requirement</td>
<td>28 KB (once only) + 5 KB (per controller)</td>
</tr>
<tr>
<td>Computing time</td>
<td>Approx. 2 ms (S7-416)</td>
</tr>
</tbody>
</table>

More information

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ADCO is also available as a multi-range controller (ADMR). The special feature of this version is that the control range can be divided into a maximum of 8 zones which can be individually optimized. Switching over between the zones can be carried out by the user or is event-dependent.
Advanced Process Control

MATLAB/SIMULINK-DDE client: Online coupling for APC

- Configuration of possible back-up functions in the process control system
- Connection of MATLAB/SIMULINK to the process control system
- Test and optimization of the solution on the process
- If required, transfer of tried and tested functions into function blocks that can be integrated into the process control system

Function

The MATLAB/SIMULINK-DDE client comprises three blocks:

**Trigger block**

The trigger block enables the user to specify the DDE communication peer, the data format and the sampling time. It synchronizes and monitors the communication and issues warnings if the DDE channel is defective or interrupted.

**Input and output block (Edde/Adde)**

The "Edde" block writes data from MATLAB to the DDE server. Each block can manage up to four variables, and several blocks are possible. The "Edde" block reads variables into MATLAB and converts them into the corresponding format.

**MATLAB/SIMULINK-DDE client**

- Link to any SIMATIC systems by means of a PCS 7 operator station and the associated DDE server, or directly via the SIMATIC NET OLE/DDE Manager
- Link to older control systems, e.g. TELEPERM M via WinTM/Server
- Link to any DDE server

Selection and ordering data

<table>
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<th>Order No.</th>
<th>Description</th>
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<td>2XV9 450-1WC12-0LA0</td>
<td>MATLAB/SIMULINK-DDE client for SIMATIC PCS 7 V6 and V7 2 languages (German, English), executes with Windows 2000 Professional/2000 Server or Windows XP Professional/Server 2003, single license for 1 installation Runtime software, software class A Type of delivery: Software and electronic documentation on CD, runtime license on authorization diskette J: Subject to export regulations AL: N and ECCN: EAR99S</td>
</tr>
</tbody>
</table>

More information

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Overview

MATLAB/SIMULINK is a universal mathematical software tool with a wide range of functions for:
- Closed-loop control
- Data processing
- Model creation
- Optimization
- Data analysis

It is the most widely used software tool for the development of high-quality Advanced Process Control (APC) algorithms.

The MATLAB/SIMULINK-DDE client can be used for implementing the APC algorithms, which are tested in an offline simulation, in the real-time operation on the process. It permits real-time capable online linking of MATLAB/SIMULINK to any DDE server and thus "rapid prototyping" of automation functions with the entire stock of MATLAB libraries. As the algorithm developed in MATLAB does not have to be implemented again, the potential errors of a re-implementation and the associated engineering time and costs can be saved in Advanced Process Control projects.

Note:

The MATLAB/SIMULINK-DDE client can be used together with SIMATIC PCS 7 V6 and V7.

Application

Via a DDE channel, MATLAB/SIMULINK can gain read and write access to all variables declared in the operator system of the SIMATIC PCS 7 process control system (DDE server). MATLAB/SIMULINK and the MATLAB/SIMULINK-DDE client can be installed either on an operator station or an additional PC. Communication is initialized and controlled by the DDE client.

Typical procedures in developing Advanced Process Control solutions:
- Offline analysis of the problem to be solved, also including the analysis of measured process data in MATLAB/SIMULINK
- Offline synthesis of possible solutions with MATLAB/SIMULINK
- Offline test by simulation of the solutions with MATLAB/SIMULINK
- Configuration of the link on the SIMATIC PCS 7 process control system, parameterization of the DDE server
Overview

FuzzyControl++ is a Siemens configuration tool for fuzzy logic. It offers solutions for non-linear controllers and for predicting the behavior of complex mathematical procedures from process automation which are difficult or impossible to implement using standard tools.

FuzzyControl++ enables fuzzy systems to be developed and configured effectively for the automation of technical processes. Empirical process knowledge and verbally described experience can be implemented directly in open-loop and closed-loop controls, pattern recognition, decision logic, etc.

Note:
FuzzyControl++ can be used together with SIMATIC PCS 7 V6 and V7.

Application

Typical applications for fuzzy logic are:
- Open-loop and closed-loop control
- Parameter adaptation of controllers
- Fault compensation and precontrol
- Pattern recognition, process data evaluation and diagnosis
- Automation of manual process interventions of a plant operator
- Process control with coordination of subordinate open-loop and closed-loop controllers

Examples include pressure, temperature and level controls, as well as control of speed and intervals. In early-warning and diagnostics units, fuzzy logic is used for the early detection of hazardous states and for the implementation of decision-making logic.

Function

The FuzzyControl++ configuration tool supports users when creating a fuzzy system. The application of this tool requires only basic knowledge about such systems, as no mathematical or control settings have to be made. Users are supported during the configuration process by extensive online help.

The configuration tool package comprises:
- Configuration tool (executes on the Windows 2000 and Windows XP operating systems)
- Runtime software for SIMATIC PCS 7 (function block for CFC and OS faceplate).

The configuration tool is used to configure and generate the fuzzy systems. During operation, the runtime software then executes the systems which are present in a data block in the case of SIMATIC PCS 7.
## Selection and ordering data

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<tr>
<th>FuzzyControl++ for SIMATIC PCS 7 V7 (V7.1 or V7.0 SP1 and higher)</th>
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<td><strong>FuzzyControl++ D+E basic license</strong>&lt;br&gt;Configuration tool, executes with Windows 2000 and XP, 2 languages (German, English), including MPI license, S7 blocks for one application, manual&lt;br&gt;Engineering software, software class A&lt;br&gt;Type of delivery: Software on CD/DVD and license key</td>
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<td><strong>FuzzyControl++ PCS 7 package</strong>&lt;br&gt;CFC runtime module with faceplates for SIMATIC PCS 7 V7.0 + SP1 and higher&lt;br&gt;Runtime software, software class A&lt;br&gt;Type of delivery: Software on CD/DVD and license key</td>
<td>J 2XV9 450-1WC10-0PA0</td>
<td><strong>FuzzyControl++ communications package</strong>&lt;br&gt;for loading the blocks and online monitoring via the PCS 7 Industrial Ethernet plant bus&lt;br&gt;Runtime software, software class A&lt;br&gt;Type of delivery: Software on CD/DVD and license key</td>
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<td><strong>FuzzyControl++ S7 and CFC copying license for further data blocks</strong>&lt;br&gt;Runtime software, software class A&lt;br&gt;Type of delivery: Certificate of License</td>
<td>J 2XV9 450-1WC11-4XA0</td>
<td><strong>FuzzyControl++ CFC package</strong>&lt;br&gt;with blocks and faceplate for PCS 7 V6&lt;br&gt;Runtime software, software class A&lt;br&gt;Type of delivery: Software on CD/DVD and license key</td>
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J: Subject to export regulations AL: N and ECCN: EAR99S

## More information

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You can find additional information in the Internet at: www.siemens.com/fuzzycontrol
Overview

During the automation of technical processes, especially their optimization, unconventional procedures and approaches with artificial intelligence are being increasingly used in addition to traditional methods. Neural networks are frequently applied in such cases, and these have already proven their performance capability in many applications. Notable successes could be achieved using them, even for tasks where conventional optimization procedures have failed.

In contrast to classic technical systems with a powerful central unit, a neural network consists of a complex interconnection of many simple processing units, so-called neurons. The architecture copies the structure of the biological nervous system.

Neural networks are flexible and capable of learning. They can organize themselves, and work extremely rapidly due to their parallel structure.

Systems which are capable of learning can be generated by combining neural networks with fuzzy logic, and the strengths of the two procedures are combined. This opens up many new possibilities for automation technology.

The NeuroSystems configuration tool from Siemens permits the generation of artificial neural networks for non-linear controls and complex mathematical sequences in process automation and which cannot be implemented using conventional means and methods, or only at great effort.

NeuroSystems can be used to develop and train neural networks for complex control tasks, virtual sensors, predictions, identifications, classifications, etc. simply and effectively even without special know-how. This results in blocks executable in SIMATIC PCS 7 which can be integrated into the automation structure by linking in the CFC.

Note:

NeuroSystems can be used together with SIMATIC PCS 7 V7.

Benefits

There are many good reasons for using NeuroSystems:

- Artificial neural networks have now become the most frequently applied approach for black box modeling of technical, chemical and biological systems.
- As a result of the complex non-linear response of neural networks, processes can be simulated without exact knowledge of the existing relationships and conditions.
- The capability to learn and adapt, the fault tolerance, and the ability to process inexact or even contradictory information are particularly distinctive.
- NeuroSystems is exceptionally well suited to prediction, optimization, classification, identification and closed-loop control tasks.
- Neural networks created using NeuroSystems can be integrated without problem into an automation environment by using runtime modules.
- The neural networks execute completely in SIMATIC PCS 7.
- Applications based on neural networks allow increases in performance, quality, productivity and efficiency, and save personnel and time.

Application

Typical applications for neural networks include:

- Complex closed-loop controls
- Virtual sensors
- Predictions
- Identifications
- Pattern recognition
- Diagnostics and evaluation of process data

The process industry - in particular the chemical industry - and the production industry are the main fields of application for neural networks. Quality control is one of the focal points for all sectors.

Function

The NeuroSystems configuration tool supports users in the creation of neural networks. Configuration with NeuroSystems does not require any mathematical or control technology settings. Basic knowledge on such systems is sufficient.

NeuroSystems includes functions for data analysis as well as for comprehensive test and validation tasks. When working with the system, configuration engineers have access to comprehensive online help.

The NeuroSystems configuration system comprises:

- Configuration tool (executes on the engineering station with the Windows 2000 and Windows XP operating systems)
- Runtime software for SIMATIC PCS 7 (function block for CFC and OS faceplate).

The configuration tool is used to configure and generate the neural networks. During operation, the runtime software then executes the neural networks which are present in a data block in the case of SIMATIC PCS 7.
### Selection and ordering data

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<tr>
<td><strong>NeuroSystems S7 and CFC copy license for further SIMATIC PCS 7/S7 applications</strong></td>
<td>2XV9 450-1WC16-4XA0</td>
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<td>Type of delivery: Certificate of License</td>
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</table>

J: Subject to export regulations AL: N and ECCN: EAR99S

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You can find additional information in the Internet at:  
www.siemens.com/neurosystems
## Industry-specific applications

### 4/2 Cement industry
- **CEMAT:** Software for the cement industry
- **ECS/CemScanner:** Monitoring of temperature in kiln jacket
- **ECS/ProcessExpert:** Specialized for process optimization

### 4/9 Telecontrol
- **SIMATIC PCS 7 TeleControl:** Integration of widely spaced outstations
- **PCS 7 TeleControl Engineering Station**
- **PCS 7 TeleControl Operator System**

### 4/18 Telecontrol - SINAUT ST7
- **Telecontrol with SINAUT ST7**

### 4/21 Telecontrol - DNP3
- **Telecontrol with DNP3**

### 4/23 Telecontrol - SIPLUS RIC
- **Telecontrol connection to control center in SIMATIC PCS 7**
- **Telecontrol connection to third-party control center**

### 4/33 Process Analytical Technology
- **SIMATIC SIPAT:** Optimization of product development and production
Industry-specific applications  
Cement industry

CEMAT: Software for the cement industry

Overview

CEMAT is a process control system that was designed for the special requirements in the cement industry and has proved successful in many years of use worldwide in the tough environmental conditions of cement works.

The current system platform for CEMAT is the SIMATIC PCS 7 process control system whose modern architecture offers the ideal basis for future-proof and economical solutions in the cement industry. CEMAT uses the basic functionality, the open system interfaces, the flexibility and the scalability of SIMATIC PCS 7 and optimizes the operating philosophy as well as the diagnostic, signaling and interlocking concept with industry-specific software packages for the special tasks in lime and cement works. This industry software has been developed in close collaboration with the cement manufacturers and is the product of over 35 years experience in the cement industry.

Function

Drive faceplate with analog-value display, analog-value selection dialog, and curve display (from right to left)

The functionality for the cement industry supplied in the form of the CEMAT software packages is integrated into the system structure of the SIMATIC PCS 7 basic system during the installation, and can be classified as follows:

- Engineering components with function block libraries specially tailored to the cement industry
- Automation components for open-loop/closed-loop control with communications components for the controller connection
- HMI components with:
  - Redundancy and archiving functions
  - Library for all control system objects with information, diagnostic and multimedia dialogs
  - Alarm system with industry-specific service functions
  - Diagnostic system for fast recognition of faults and reduction of downtimes
  - APL look & feel with signal tracking and signal status information
- Web-compatible visualization of process displays and faceplates
- Management information: listing and statistics functions as well as long-term archiving
- Technological interfaces for linking technological add-on modules which are not part of the CEMAT product spectrum (also products from other manufacturers).
Industry-specific applications

Cement industry

CEMAT: Software for the cement industry

Function (continued)

Notes on delivery

CEMAT can be supplied in two versions:

- CEMAT V7.1 (current version; for new plants),
  can be used on system platform SIMATIC PCS 7 V7.1 incl.
  Service Pack

- CEMAT V7.0 (alternative, particularly for plant expansions),
  can be used on system platform SIMATIC PCS 7 V7.0 or
  SIMATIC PCS 7 V7.1 without Service Pack

SIMATIC PCS 7 is not supplied with CEMAT, but must be ordered separately (see Catalog ST PCS 7).

Message display with sector-specific information and message selection area

It is especially worth noting the extensive multimedia support, e.g. by means of:

- Video sequences for operating and service personnel
- Showing of pictures in process screens
- Integration of AutoCAD drawings (DXF format)
- Integration of plant plans
- Context-sensitive provision of information depending on place and time

Object-based information area with I/O information
<table>
<thead>
<tr>
<th>Selection and ordering data</th>
<th>Order No.</th>
<th>CEMAT RSRT9 V7.1 (9 AS)</th>
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<td>CEMAT OS software for single station incl. AS runtime licenses (PLC)</td>
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<td>OS software Single Station Runtime incl. 3 runtime licenses for AS (PLC), software class A, 2 languages (German, English), executes with Windows Server 2003/XP Professional, single license for 1 installation</td>
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<td>OS software Client Runtime, software class A, 2 languages (German, English), executes with Windows XP Professional, single license for 1 installation</td>
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<tr>
<td>CEMAT RSRT3 V7.1 (3 AS)</td>
<td>6DL5 433-8AA17-0XA0</td>
<td>OS software Runtime for redundant pair of servers incl. runtime licenses for 3 AS (PLC), software class A, 2 languages (German, English), executes with Windows Server 2003, single license for 2 installations</td>
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<td>6DL5 433-8AB17-0XA0</td>
<td>OS software Runtime for redundant pair of servers incl. runtime licenses for 6 AS (PLC), software class A, 2 languages (German, English), executes with Windows Server 2003, single license for 2 installations</td>
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<tr>
<td>CEMAT Software Upgrade V7.1 for upgrading existing CEMAT installations V6.1 and higher</td>
<td></td>
<td>for Engineering and runtime software, software class A, 2 languages (German, English), executes with Windows XP Professional/Server 2003, single license for 1 installation</td>
<td></td>
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<td>Type of delivery: software and documentation on DVD, 2 license key memory sticks for WinCC User Archive Upgrade, certificate of license</td>
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<td>Can only be used together with a valid CEMAT license.</td>
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## Ordering data

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<tr>
<th>CEMAT V7.0 software packages</th>
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<tr>
<td>CEMAT engineering software</td>
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<tr>
<td>CEMAT OSENG V7.0</td>
<td>6DL5 436-8AX07-0XA0</td>
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<tr>
<td>Engineering software, software class A, 2 languages (German, English), executes with Windows Server 2003/XP Professional, single license for 1 installation</td>
<td></td>
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<tr>
<td>Type of delivery: software and documentation on DVD, license key disk, certificate of license</td>
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<tr>
<td>CEMAT OS software for single station incl. AS runtime licenses (PLC)</td>
<td></td>
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<tr>
<td>CEMAT OSRT3 V7.0 (3 AS)</td>
<td>6DL5 434-8AA07-0XA0</td>
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<tr>
<td>OS software Single Station Runtime incl. 3 runtime licenses for AS (PLC), software class A, 2 languages (German, English), executes with Windows Server 2003/XP Professional, single license for 1 installation</td>
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<td>CEMAT OS software for client</td>
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<td>CEMAT MC V7.0</td>
<td>6DL5 435-8AX07-0XA0</td>
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<td>OS software Client Runtime, software class A, 2 languages (German, English), executes with Windows XP Professional, single license for 1 installation</td>
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<td>CEMAT OS software for redundant pair of servers incl. AS runtime licenses (PLC)</td>
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<th>Order No.</th>
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<td>OS software Runtime for redundant pair of servers incl. runtime licenses for 9 AS (PLC), software class A, 2 languages (German, English), executes with Windows Server 2003, single license for 2 installations</td>
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<tr>
<td>Type of delivery: software and documentation on DVD, 2 license key disks, certificate of license</td>
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<td>CEMAT RSRTU V7.0 (unlimited AS)</td>
<td>6DL5 433-8AD07-0XA0</td>
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<td>OS software Runtime for redundant pair of servers incl. runtime licenses for unlimited AS (PLC), software class A, 2 languages (German, English), executes with Windows Server 2003, single license for 2 installations</td>
<td></td>
</tr>
<tr>
<td>Type of delivery: software and documentation on DVD, 2 license key disks, certificate of license</td>
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</tr>
</tbody>
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### More information

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www.siemens.com/cemat
Industry-specific applications

Cement industry

ECS/CemScanner: Monitoring of temperature in kiln jacket

Overview

Correct measurement of the temperature on the jacket of a rotary kiln is important for efficient operation of processes carried out in cement and lime kilns. ECS/CemScanner represents state-of-the-art technology in infrared scanning systems for kiln shells. The system combines a rugged design with advanced software functions, and is an indispensable aid for kiln operation and optimization.

Note:
ECS/CemScanner can be used together with SIMATIC PCS 7 V6 and V7.

Benefits

Advantages through application of ECS/CemScanner:
- Increased availability of kiln
- Reduced consumption of refractories
- Fewer downtimes
- Reduced heat consumption
- Overhauls can be planned

As the first supplier of computer-based scanner systems for the cement industry, FLSmidth Automation has comprehensive experience gained from more than 600 successful system installations worldwide.

The further development of the ECS/CemScanner is characterized by two key terms: Precision and quality. The system uses a highly precise calculation algorithm to process the measured values delivered by the high-quality scanner probe. Since the scanner probe can be positioned outside the kiln axis for practical reasons (possibly even on the preheating tower), the software takes into account the actual plant geometry in order to optimize the precision of the temperature profile. A complete image of the temperature on the kiln jacket is produced during just one revolution. The measuring point is usually smaller than one brick.
Application

The design of the scanner equipment is appropriate for the most harsh environmental conditions, and ensures long-term and fault-free operation with a good measuring performance. The scanner is accommodated in a stainless-steel protective housing and equipped with an air filter.

Special features of the ECS/CemScanner system:

- Refractory control:
  Graphic display and management of lining for kiln maintenance
- Brick thickness:
  Online calculation and graphic display of brick and lining thickness
- Live ring migration:
  Exact calculation and online monitoring of distance between ring and kiln jacket
- Fan control:
  Automatic starting/stoping of cooling fans underneath the kiln burning zone
- PyroScan:
  Support of seamless integration of pyrometer measurements in areas which cannot be reached by the scanner

Software features of the ECS/CemScanner system:

- Thermal profile with different statistical values
- Display of kiln cross-section
- Thermal 3D display of kiln from any position
- 360° 3D display of kiln interior
- 2D or 3D zoom
- Animated playback of recorded data
- Delta mode (comparison of two display profiles)
- Customized range of colors
- Configurable online monitoring of scanner hardware state
- Data exchange with the CEMAT system based on SIMATIC PCS 7
- Operator interface in all important languages
Industry-specific applications
Cement industry

ECS/ProcessExpert: Specialized for process optimization

Overview

ECS/ProcessExpert is specialized in powerful control and optimization solutions for complex processes such as e.g. pyro. ECS/ProcessExpert exhibits enhanced control and optimization capabilities tailored to fulfill individual user requirements.

Various dedicated applications are available on the ECS/ProcessExpert platform, e.g.:
- Kiln and cooler applications for cement and lime processes
- Application for ball and cement mills
- Online determination of degree of fineness in cement mills
- Online determination of free lime and NOx in pyro processes
- Application for SAG mills in mining applications

Note:
ECS/ProcessExpert can be used together with SIMATIC PCS 7 V6 and V7.

Benefits

ECS/ProcessExpert applications profit from more than two decades of experience in the process industry, especially in the cement industry. They feature the following advantages:
- Uniform process sequence, with significantly reduced maintenance costs as a result
- Reduction in production costs, e.g. in the costs for energy and heat
- Fewer quality variations in final product
- Increase in production as result of improved process stability and availability

Design

Open APC toolbox

ECS/ProcessExpert is an open toolbox for the development of advanced process control (APC) applications.

The toolbox is an object-oriented environment with a number of predefined objects for fast prototyping of applications and control strategies. For the previously mentioned dedicated applications, process engineers have complete access to the engineering module of ECS/ProcessExpert. This enables further updating and adaptation of the optimization solutions.

Depending on the type of application, advanced expert system technologies are used in the ECS/ProcessExpert application modules in order to implement hybrid automation concepts, e.g.
- Fuzzy logic
- Neural networks
- Statistical process control (SPC)
- Model-based predictive control (MPC)

The application modules continuously analyze the process conditions using complex evaluations. They can execute appropriate control measures more frequently and reliably than operating personnel.

As an open toolbox, ECS/ProcessExpert permits adaptation of the implemented solutions to the specific requirements of each plant with optimum control know-how. As an integrated environment, the system offers an easy to use and open interface to the MATLAB software package for advanced implementations by the user.

ECS/ProcessExpert has an OPC interface for comprehensive data exchange and integration into the CEMAT system based on SIMATIC PCS 7.

More information

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Integration and communication options with SIMATIC PCS 7 TeleControl V7.1

Plants are often scattered over very large grounds in the energy and transportation industries, and especially in the water & wastewater and oil & gas industries. In such cases it is necessary to integrate outstations for monitoring and controlling highly remote plant units (usually with a small or medium degree of automation) into the control system of the complete plant. This is carried out by means of telecontrol protocols over a WAN (Wide Area Network).

Conventional automation solutions for telecontrol systems use process control systems for the more complex central areas of the plant, and simpler Remote Terminal Units (RTUs) for the outstations, and then combine these separately configured plant units in a host network control system.

Direct integration of the telecontrol center

However, it is far more efficient if the telecontrol center for the RTUs is directly integrated into the process control system. The network control system as the superimposed integration level can then be omitted.

### RTU category | RTU type1) | Possible telecontrol protocols
--- | --- | ---
Small with up to approx. 30 I/Os | Controller integrated in SIMATIC ET 200S | Modbus, IEC 870-5-101, IEC 870-5-104
For small, cost-sensitive applications | SIMATIC S7-300/S7-300F controller | SINAUT ST7, DNP3, Modbus, IEC 870-5-101, IEC 870-5-104
Medium with up to approx. 100 I/Os | For medium sized applications | SIMATIC S7-400/S7-400F controller | DNP3, IEC 870-5-101, IEC 870-5-104
Large with up to approx. 500 I/Os | For larger applications requiring higher performance | SIMATIC S7-400/S7-400FH controller | SINAUT ST7, DNP3, Modbus, IEC 870-5-101, IEC 870-5-104

1) Also in version "SiPLUS extreme", e.g. for environments with temperature from -25 °C to +70 °C, condensation, or medial loading.
## Industry-specific applications

### Telecontrol

**SIMATIC PCS 7 TeleControl: Integration of widely spaced outstations**

### Benefits
- SIMATIC PCS 7 TeleControl V7.1 cannot only integrate newly configured RTUs into SIMATIC PCS 7 V7.1, but also migrate units which already exist in outdoor areas.
- As a result of its high level of integration, automation based on SIMATIC PCS 7 TeleControl V7.1 offers decisive advantages compared to previous automation solutions with telecontrol engineering.
  - The uniform SIMATIC PCS 7 V7.1 software platform allows high efficiency during operation, and results in low costs for training, configuration and servicing.
  - The homogenous GUI for local and remote processes simplifies operation and simultaneously reduces the risk of an operator error.
- The Data Base Automation (DBA) software efficiently supports engineering and takes into account the conformity with SIMATIC PCS 7 V7.1.
  - DBA considerably facilitates project-specific adaptation of the system and importing of existing configurations in the course of migration.
  - Extensions can be added during plant operation.

### Application
Remote control and monitoring of distributed stations, as well as data recording and transmission, with the following focal points:
- **Water industry**
  - Well, pumping and slide valve stations in water supply networks and irrigation plants
  - Pumping and slide valve stations in water and wastewater pipelines
  - Storm-water tanks and siphon stations in wastewater networks
  - Storage units (elevated tanks)
- **Oil and gas industries**
  - Compressor, pressure reduction, transfer, block valve, and metering stations in gas networks
  - Pumping and slide valve stations in oil pipelines
  - Automation on the wellhead of gas and oil wells
  - Stations for the injection of water or CO₂ in gas or oil fields
- **Energy management, environmental protection, and transportation**
  - Equipment for power generation and distribution
  - District heating
  - Traffic control systems
  - Tunnels
  - Railway stations
  - Lighthouses
  - Environmental monitoring equipment
  - Weather stations

### Design
The telecontrol center for the outstations (RTUs) is integrated into the process control of the SIMATIC PCS 7 V7.1 process control system in the form of an operator station in single station or server design (also redundant as option). No additional automation system for conditioning and connecting telecontrol-specific data need be planned in the SIMATIC PCS 7 system. With large quantity frameworks, a PCS 7 TeleControl operator station (single station/server) is preferably responsible only for the telecontrol mode (dedicated). With small quantity frameworks, a server or a single station can also control SIMATIC PCS 7 automation systems in central plant areas in addition to the RTUs (dual-channel mode).

To enable engineering of the PCS 7 telecontrol operator station (single station/server), the functions of the engineering station of the SIMATIC PCS 7 V7.1 process control system are expanded by the DBA technology (Data Base Automation) and the SIMATIC PCS 7 TeleControl V7.1 block library.

For communication with the RTUs, SIMATIC PCS 7 TeleControl V7.1 uses the telecontrol protocols SINAUT ST7, DNP3 and Modbus (both via serial and TCP/IP communication connections) as well as IEC 870-5-101 (serial) and IEC 870-5-104 (Ethernet TCP/IP).

With serial RTU interfacing, the telecontrol connection can be implemented cost-effectively at the control center end (PCS 7 TeleControl OS as single station or server) using the following components:
- SINAUT TIM communication modules (SINAUT ST7 telecontrol protocol)
- TCP/IP converter - serial e.g. devices from the company MOXA or Lantronix (DNP3, Modbus, IEC 870-5-101 telecontrol protocols)

By means of Ethernet TCP/IP, the outstations can be connected either directly or via TCP/IP WAN routers to the SIMATIC PCS 7 system bus (SINAUT ST7, DNP3, Modbus, IEC 870-5-104 telecontrol protocols). When using the SINAUT ST7 telecontrol protocol, the SINAUT TIM communication module can be used in addition to the TCP/IP WAN router or as an alternative.

The following table shows the current connection possibilities depending on the type of RTU and type of communication.
Outstations for integration (RTU)
Current range, communication options and features

<table>
<thead>
<tr>
<th>Telecontrol protocol</th>
<th>SINAUT ST7</th>
<th>Modbus</th>
<th>DNP3</th>
<th>IEC 870-5-101</th>
<th>IEC 870-5-104</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of communication</strong></td>
<td>Serial</td>
<td>Ethernet TCP/IP</td>
<td>Serial</td>
<td>Ethernet TCP/IP</td>
<td>Serial</td>
</tr>
<tr>
<td><strong>Interface on the PCS 7 TeleControl OS</strong></td>
<td>TIM 4R-IE</td>
<td>TCP/IP serial converter</td>
<td>TIM 4R-IE</td>
<td>TCP/IP WAN router</td>
<td>TIM 4R-IE</td>
</tr>
<tr>
<td><strong>RTU interface</strong></td>
<td>ET 200S with integral CPU (corresponds to S7-314)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>S7-300/ S7-300F</td>
<td>TIM 3V-IE</td>
<td>TIM 3V-IE</td>
<td>CP 341</td>
<td>CP 341 + SW library</td>
</tr>
<tr>
<td></td>
<td>S7-400/ S7-400F</td>
<td>TIM 4R-IE</td>
<td>TIM 4R-IE</td>
<td>CP 441</td>
<td>CP 441 + SW library</td>
</tr>
<tr>
<td></td>
<td>S7-400H/ S7-400FH</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Third-party station</strong></td>
<td>–</td>
<td>–</td>
<td>Depends on type of station</td>
<td>Depends on type of station</td>
<td>Depends on type of station</td>
</tr>
<tr>
<td><strong>Dialup lines</strong></td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
</tr>
<tr>
<td><strong>Dedicated lines and radio networks</strong></td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
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<td><strong>Master/slave</strong></td>
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<td>DNP3</td>
<td>DNP3</td>
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<td><strong>Peer-to-peer</strong></td>
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<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
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<tr>
<td><strong>Mesh networks</strong></td>
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<td>DNP3</td>
<td>DNP3</td>
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<tr>
<td><strong>Time tagging in RTU</strong></td>
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<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
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<tr>
<td><strong>RTU time synchronization</strong></td>
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<td>DNP3</td>
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<tr>
<td><strong>Data buffering in RTU</strong></td>
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<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
</tr>
<tr>
<td><strong>International standard</strong></td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
<td>DNP3</td>
</tr>
</tbody>
</table>

1) Data buffering is limited to two SIMATIC S7 data blocks. Depending on the SIMATIC CPU, this corresponds to ca. 800 to 3,200 buffered frames.

The telecontrol protocols used by SIMATIC PCS 7 TeleControl for remote communication are matched to the conditions of the widely distributed communication infrastructure. The WAN transmission media suitable for communication between the RTUs and the telecontrol center are diverse, e.g.

- Private networks
  - Wireless
  - Dedicated line
  - WLAN

- Public networks
  - GPRS
  - EGPRS
  - UMTS
  - DSL
Industry-specific applications

Telecontrol

**SIMATIC PCS 7 TeleControl:**
Integration of widely spaced outstations

### Design (continued)

Based on the four basic topological forms (point-to-point, multipoint, star, and ring), differently structured telecontrol networks can be implemented with these media versions, e.g. star over wireless, dedicated line or DSL. Through a combination of several basic topologies of the same or different media versions, it is also possible to design more complex network topologies, even with redundant communication paths. Optimum adaptation to the local conditions and the infrastructure which may already exist is possible in this manner.

### Migration of existing telecontrol systems

**SINAUT ST1 stations based on SIMATIC S5**

In the course of migration of existing plants, RTUs based on SIMATIC S5 can also be integrated via SIMATIC PCS 7 TeleControl into the process control system. In the process, the ST1 telecontrol protocol is converted into the ST7 protocol in the central TIM communication module.

**Units with Modbus communication**

SIMATIC PCS 7 TeleControl V7.1 cannot only integrate new RTUs into SIMATIC PCS 7 V7.1, it can also integrate plant sections which already exist outdoors, for example, plant sections which have a Modbus infrastructure. These sections can be integrated into SIMATIC PCS 7 using the Modbus protocol via serial lines or TCP/IP connections.

Whereas RTUs with Modbus TCP/IP interface can be integrated directly, third-party RTUs require special interface converters for telecontrol communication.

**Third-party stations with telecontrol protocols**

In addition to the Modbus telecontrol protocol, the DNP3 (serial and TCP/IP), IEC 870-5-101 (serial) and IEC 870-5-104 (TCP/IP) telecontrol protocols also support the control center interfacing of third-party RTUs in the course of migration. A prerequisite is that the RTU supports the corresponding protocol and that the required interface converters are available.

**Third-party stations with OPC**

Third-party RTUs for which an OPC server exists can be integrated into the process control with the PCS 7 TeleControl operator system using additional engineering services on the basis of the DBA technology. SIMATIC PCS 7 TeleControl then supports data exchange between the operator system (OPC client) and the RTU (OPC server) per OPC DA.

**SINAUT LSX systems**

Existing SINAUT LSX systems can also be migrated with SIMATIC PCS 7 TeleControl V7.1. The SIMATIC S7 controllers with the EDC telecontrol protocol (Event Driven Communication) installed in the SINAUT LSX system are integrated into SIMATIC PCS 7 TeleControl V7.1 per PCS 7 TeleControl S7 EDC drivers (for ordering data, refer to the following catalog section PCS 7 TeleControl operator system). Because the SINAUT LSX system can coexist at all levels next to the new system architecture as long as necessary, step-by-step modernization is possible without short-lived intermediate solutions.

### Mode of operation

With SIMATIC PCS 7 TeleControl V7.1, the outstations can be integrated into SIMATIC PCS 7 V7.1 so that the operator notices no difference between central or remote automation with regard to the operating philosophy and alarm response.

The OS clients of the client/server multi-user system are able to display data from RTUs and SIMATIC PCS 7 automation systems (AS) - which they receive from a server with dual-channel functionality or from two separate servers - together in one process image. Display is primarily on faceplates for process objects such as motors, valves etc., but also by means of trend curves and messages.

If the PCS 7 TeleControl OS server is of redundant design, the redundant pair of PCS 7 TeleControl OS servers matches all internally generated information (e.g. alarm states and results of calculations).

The communication mode between the control center and RTU depends on the type of WAN, the configuration of the telecontrol communication, and the support by the telecontrol protocol. Possible operating modes with the SINAUT ST7 telecontrol protocol are described, for example, in the catalog section “Telecontrol with SINAUT ST7.”

### Function

Conditioning and display of data on the PCS 7 TeleControl OS (single stations/servers) are carried out by SIMATIC PCS 7 TeleControl blocks present in a library. These blocks support operator prompt timing in conformance with SIMATIC PCS 7 using symbols and faceplates, and also the hierarchy of the SIMATIC PCS 7 alarms.

In addition to blocks for processing of process data, the library also contains blocks for diagnostics and control of communication. If necessary, the supplied basic library can be extended using the DBA Type Editor by new script-based block types specific to the project.

Engineering can be automated efficiently and in conformance with SIMATIC PCS 7 using the DBA technology. DBA supports plant expansion during ongoing operation, and facilitates project-specific adaptation of the system as well as importing of existing configurations in the course of migration.

When linking RTUs by means of SINAUT ST7, DNP3, IEC 870-5-101 or IEC 870-5-104 telecontrol protocol, the raw data in the outstations is provided with a time tag and transmitted to the PCS 7 TeleControl OS (server/single station) acting as control center. Adaptation, further processing and archiving are carried out there. This procedure is appropriate for the event-based principle of operation of the telecontrol protocol as well as the subsequent chronological processing of data which was buffered in the outstation.

The time and date of the outstations connected per SINAUT ST7, DNP3, IEC 870-5-101 or IEC 870-5-104 can be synchronized by the PCS 7 TeleControl OS (time master). Switchover between daylight-saving time and standard time is also taken into account.

In order to comply with guidelines, statutory directives and standards it may be necessary to provide special proof, e.g. proof of conformity with the ATV M260 guideline for sewage treatment plants. For this we recommend the ACRON software package equipped with even more functionality for long-term archiving and logging. This is an additional add-on product for SIMATIC PCS 7 in this catalog.

### More information

Detailed information, ordering data and technical specifications on the individual SIMATIC PCS 7 TeleControl products can be found in the following sections "PCS 7 TeleControl Engineering System" and "PCS 7 TeleControl Operator System".

[www.siemens.com/simatic-pcs7/telecontrol](http://www.siemens.com/simatic-pcs7/telecontrol)
Overview

The PCS 7 TeleControl OS Engineering V7.1 software package is used to configure a SIMATIC PCS 7 industrial workstation of single station or server design as a SIMATIC PCS 7 TeleControl engineering station.

Design

PCS 7 TeleControl OS Engineering V7.1

The PCS 7 TeleControl OS Engineering V7.1 software package consists of the following components:

- SIMATIC PCS 7 Engineering Software V7.1 for OS, unlimited POs (see section "ES Software" in chapter "Engineering System" of the current ST PCS 7 catalog)
- PCS 7 TeleControl OS DBA V7.1
  Engineering package for creating PCS 7 TeleControl OS applications; contains the TeleControl OS block library for SIMATIC PCS 7.

SIMATIC PCS 7 Engineering PowerPacks and additional SIMATIC PCS 7 ES software components for the PCS 7 TeleControl engineering station can be ordered in the chapter "Engineering System", section "ES Software", of the ST PCS 7 catalog.

SIMATIC PCS 7 industrial workstations suitable as basic hardware for a SIMATIC PCS 7 TeleControl engineering station can be found in the ST PCS 7 catalog, chapter "SIMATIC PCS 7 Industrial Workstation/PC".

PCS 7 TeleControl OS DBA V7.1

PCS 7 TeleControl OS DBA V7.1 is an OS engineering package for expansion of the SIMATIC PCS 7 Engineering Software V7.1, comprising the OS Data Base Automation (DBA) software and a library with OS symbols, OS faceplates and OS diagnostics displays for outstations (RTUs) of a telecontrol system.

Using the DBA type editor it is possible to assign the frequently unstructured variables of an RTU once to a block type and to display the tag structured on the operator station via the block's faceplate (OS faceplate). Each block type contains at least one faceplate and one symbol.

The DBA automatically generates the OS runtime database with the display hierarchy, required tags, interrupts, alarm messages, and alarm priorities, as well as the specific faceplates and block symbols. The display hierarchy is the basis for navigation between the process displays, for alarm management, and for implementation of safety measures. PCS 7 TeleControl OS DBA V7.1 automatically positions the type-specific block symbols, for example, measured value, counter value, motor or gate valve, in the OS process pictures. These symbols are linked to the corresponding function blocks and faceplates using the database. Manual configuration is mainly limited to the design and positioning of the static graphic elements, for example, tubes or tanks.

The PCS 7 TeleControl OS symbols, faceplates and diagnostics displays created in conformance with SIMATIC PCS 7 take into account the specific features of telecontrol applications. This is demonstrated, for example, by the example of the counter block which offers versatile conditioning options for information on transported or processed quantities and volumes.
Industry-specific applications
Telecontrol

PCS 7 TeleControl Engineering Station

Design (continued)
Definition of new user blocks

New user blocks can also be defined using the DBA type editor, and are handled during database generation like the blocks from the basic library.

In addition to arrangement of information in a variable structure, these user blocks can also calculate derived values using Visual Basic scripts in the server. This results in numerous possibilities for extending the functionality and for adapting the system to individual customer requirements.

Type-specific OS faceplates and OS symbols for the user blocks can be created using the standard tools for SIMATIC PCS 7 OS engineering (Graphics Designer and Faceplate Designer).

Selection and ordering data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PCS 7 TeleControl OS Engineering V7.1 (unlimited POs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Software package with SIMATIC PCS 7 Engineering Software V7.1+SP2, unlimited POs (cannot be used as operator station for productive operation)</td>
</tr>
<tr>
<td></td>
<td>Engineering software, 2 languages (German, English), software class A, executes with Windows XP Professional / Server 2003, floating license for 1 user</td>
</tr>
<tr>
<td></td>
<td>Electronic documentation on CD/DVD, 2 languages (German, English)</td>
</tr>
<tr>
<td></td>
<td>Type of delivery:</td>
</tr>
<tr>
<td></td>
<td>• License key memory stick, certificate of license including terms and conditions</td>
</tr>
<tr>
<td></td>
<td>• SIMATIC PCS 7 Software Media Package V7.1+SP2</td>
</tr>
<tr>
<td></td>
<td>• CD &quot;PCS 7 TeleControl Option V7.1+SP2&quot;</td>
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<table>
<thead>
<tr>
<th>Order No.</th>
<th>PCS 7 TeleControl OS Engineering Component Option V7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To upgrade an existing SIMATIC PCS 7 Engineering Station V7.1+SP2 (unlimited POs) for PCS 7 TeleControl V7.1+SP2; software package without SIMATIC PCS 7 Engineering Software V7.1+SP2</td>
</tr>
<tr>
<td></td>
<td>Engineering software, 2 languages (German, English), software class A, executes with Windows XP Professional / Server 2003, floating license for 1 user</td>
</tr>
<tr>
<td></td>
<td>Electronic documentation on CD, 2 languages (German, English)</td>
</tr>
<tr>
<td></td>
<td>Type of delivery:</td>
</tr>
<tr>
<td></td>
<td>• License key memory stick, certificate of license including terms and conditions</td>
</tr>
<tr>
<td></td>
<td>• CD &quot;PCS 7 TeleControl Option V7.1+SP2&quot;</td>
</tr>
</tbody>
</table>

D: Subject to export regulations AL: N and ECCN: 5D992
Overview

The PCS 7 TeleControl OS software packages V7.1 offered for OS runtime mode are tailored to the architecture of the SIMATIC PCS 7 operator system V7.1. They support single-user systems (single stations) as well as multi-user systems with up to 12 servers/redundant pairs of servers and up to 32 clients.

Design

PCS 7 TeleControl OS servers and PCS 7 TeleControl OS single stations can integrate both local SIMATIC PCS 7 automation systems and widely distributed outstations (RTUs) of a telecontrol system into the process control.

Depending on the configuration of a PCS 7 TeleControl operator system as single station or client/server combination (single or redundant), the following software components are required:

<table>
<thead>
<tr>
<th>Software required</th>
<th>SIMATIC PCS 7 architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OS single station</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>PCS 7 TeleControl OS Single Station V7.1</td>
<td></td>
</tr>
<tr>
<td>PCS 7 TeleControl OS Server V7.1</td>
<td></td>
</tr>
<tr>
<td>PCS 7 TeleControl OS Redundant Server V7.1</td>
<td></td>
</tr>
<tr>
<td>PCS 7 TeleControl Driver (alternative)</td>
<td></td>
</tr>
<tr>
<td>SINAUT</td>
<td>(2 licenses)</td>
</tr>
<tr>
<td>DNP3</td>
<td>(2 licenses)</td>
</tr>
<tr>
<td>IEC 870-5-101/-104</td>
<td>(2 licenses)</td>
</tr>
<tr>
<td>Modbus</td>
<td>(2 licenses)</td>
</tr>
<tr>
<td>S7 EDC</td>
<td>(2 licenses)</td>
</tr>
<tr>
<td>PCS 7 OS Software Client V7.1</td>
<td></td>
</tr>
</tbody>
</table>

See section “OS software” in chapter “Operator System” of ST PCS 7 catalog

SIMATIC PCS 7 OS Software Power Packs (single station/server) and additional SIMATIC PCS 7 OS software components for PCS 7 TeleControl operator systems V7.1 can be ordered from ST PCS 7 catalog (chapter “Operator System”, section “OS Software”).

SIMATIC PCS 7 industrial workstations suitable as basic hardware for configuration of an operator station as PCS 7 TeleControl single station, PCS 7 TeleControl OS server or PCS 7 TeleControl client can be found in ST PCS 7 catalog (chapter “SIMATIC PCS 7 Industrial Workstation/PC”).

PCS 7 TeleControl OS Software (single station/server/redundant server)

The PCS 7 TeleControl OS software packages available in 3 versions (single station/server/redundant server) for OS runtime mode contain the following components:

- SIMATIC PCS 7 OS Software Runtime V7.1 (250 PoS, including 512 archive tags) for OS single station, OS server or redundant pair of OS servers (including WinCC/Redundancy and RS 232 connection cable, 10 m)
- PCS 7 TeleControl Runtime Software V7.1
- Library with PCS 7 TeleControl OS faceplates and symbols

In addition, a PCS 7 TeleControl Driver license is required for each telecontrol protocol used (SINAUT, DNP3, IEC 870-5-101/-104, Modbus, S7 EDC) per PCS 7 TeleControl OS single station and per PCS 7 TeleControl OS server.
## Selection and ordering data

<table>
<thead>
<tr>
<th>PCS 7 TeleControl OS Single Station V7.1 (250 POs)</th>
<th>Order No.</th>
<th>PCS 7 TeleControl OS Redundant Server V7.1</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software package with SIMATIC PCS 7 OS Software Single Station V7.1+SP2, 250 POs, including 512 archive tags; Runtime software, 2 languages (German, English), software class A, executes with Windows XP Professional, single license for 1 installation Electronic documentation on CD/DVD, 2 languages (German, English) Type of delivery: • License key memory stick, certificate of license including terms and conditions • SIMATIC PCS 7 Software Media Package V7.1+SP2 • CD &quot;PCS 7 TeleControl Option V7.1+SP2&quot;</td>
<td>6DL5 001-8AA17-0XA0</td>
<td>Software package with SIMATIC PCS 7 Server Redundancy V7.1+SP2, 250 POs, including 512 archive tags (includes: WinCC/Redundancy and RS 232 connecting cable, 10 m) Runtime software, 2 languages (German, English), software class A, executes with Windows Server 2003, single license for 2 installations Electronic documentation on CD/DVD, 2 languages (German, English) Type of delivery: • License key memory stick, certificate of license including terms and conditions • SIMATIC PCS 7 Software Media Package V7.1+SP2 • CD &quot;PCS 7 TeleControl Option V7.1+SP2&quot;, RS 232 connecting cable, 10 m</td>
<td>6DL5 002-8BA17-0XA0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PCS 7 TeleControl OS Server V7.1</th>
<th>Order No.</th>
<th>PCS 7 TeleControl OS Runtime Component Option V7.1</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software package with SIMATIC PCS 7 OS Software Server V7.1+SP2, 250 POs, including 512 archive tags Runtime software, 2 languages (German, English), software class A, executes with Windows Server 2003, single license for 1 installation Electronic documentation on CD/DVD, 2 languages (German, English) Type of delivery: • License key memory stick, certificate of license including terms and conditions • SIMATIC PCS 7 Software Media Package V7.1+SP2 • CD &quot;PCS 7 TeleControl Option V7.1+SP2&quot;</td>
<td>6DL5 002-8AA17-0XA0</td>
<td>To expand an existing SIMATIC PCS 7 OS V7.1+SP2 (server/single station) for PCS 7 TeleControl V7.1+SP2 Software package without SIMATIC PCS 7 OS Software V7.1+SP2 Runtime software, 2 languages (German, English), software class A, executes with Windows Professional or Windows Server 2003, single license for 1 installation Electronic documentation on CD, 2 languages (German, English) Type of delivery: • License key memory stick, certificate of license including terms and conditions • CD &quot;PCS 7 TeleControl Option V7.1+SP2&quot;</td>
<td>6DL5 002-8AA17-0XE0</td>
</tr>
</tbody>
</table>

D: Subject to export regulations AL: N and ECCN: 5D992
### Ordering data

<table>
<thead>
<tr>
<th>PCS 7 TeleControl SINAUT Driver</th>
<th>Order No.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS 7 TeleControl DNP3 driver</td>
<td>6DL5 101-8AX00-0XB0</td>
<td></td>
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<tr>
<td>PCS 7 TeleControl Modbus Driver</td>
<td>6DL5 101-8EX00-0XB0</td>
<td>6DL5 101-8CX00-0XB0</td>
</tr>
<tr>
<td>PCS 7 TeleControl S7 EDC Driver</td>
<td>6DL5 101-8DX00-0XB0</td>
<td>6DL5 101-8BX00-0XB0</td>
</tr>
</tbody>
</table>

**Ordering data**

**PCS 7 TeleControl SINAUT Driver**
Runtime software, license for one OS single station or one OS server, software class A, executes with Windows XP Professional or Windows Server 2003, single license for 1 installation
**Requirement:** Software PCS 7 TeleControl OS Single Station or PCS 7 TeleControl OS Server
**Type of delivery:**
- License key memory stick, certificate of license including terms and conditions

**PCS 7 TeleControl DNP3 driver**
Runtime software, license for one OS single station or one OS server, software class A, executes with Windows XP Professional or Windows Server 2003, single license for 1 installation
**Requirement:** Software PCS 7 TeleControl OS Single Station or PCS 7 TeleControl OS Server
**Type of delivery:**
- License key memory stick, certificate of license including terms and conditions

**PCS 7 TeleControl IEC 870-5-101/-104 Driver**
Runtime software, license for one OS single station or one OS server, software class A, executes with Windows XP Professional or Windows Server 2003, single license for 1 installation
**Requirement:** Software PCS 7 TeleControl OS Single Station or PCS 7 TeleControl OS Server
**Type of delivery:**
- License key memory stick, certificate of license including terms and conditions

**PCS 7 TeleControl Modbus Driver**
Runtime software, license for one OS single station or one OS server, software class A, executes with Windows XP Professional or Windows Server 2003, single license for 1 installation
**Requirement:** Software PCS 7 TeleControl OS Single Station or PCS 7 TeleControl OS Server
**Type of delivery:**
- License key memory stick, certificate of license including terms and conditions

**PCS 7 TeleControl S7 EDC Driver**
Runtime software, license for one OS single station or one OS server, software class A, executes with Windows XP Professional or Windows Server 2003, single license for 1 installation
**Requirement:** Software PCS 7 TeleControl OS Single Station or PCS 7 TeleControl OS Server
**Type of delivery:**
- License key memory stick, certificate of license including terms and conditions

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Industry-specific applications

Telecontrol - SINAUT ST7

Overview

Telecontrol with SINAUT ST7

The SINAUT ST7 telecontrol protocol is used for fully automatic monitoring and control of widely distributed outstations (RTUs) via one or more control centers. Flexible networks for communication between RTUs and also between RTUs and control center(s) can be implemented using diverse WAN (Wide Area Network) media with utilization of the existing communication infrastructure.

The telecontrol center can be integrated in the SIMATIC PCS 7 process control system using SIMATIC PCS 7 TeleControl.

Note:
Telecontrol with SINAUT ST7 is possible together with SIMATIC PCS 7 TeleControl V7.1 and SIMATIC PCS 7 V7.1.

Design

The following types of RTU are suitable as outstations and node stations in telecontrol applications with the SINAUT ST7 telecontrol protocol:

- SIMATIC S7-300/S7-300F controller (up to approx. 100 I/Os)
- SIMATIC S7-400/S7-400F controller (up to approx. 500 I/Os)

Further hardware and software components from the Catalog IK PI round off the Siemens product range for configuration of SINAUT ST7 telecontrol applications:

- TIM communication modules
- MD modem modules
- Mobile radio components
- Industrial Ethernet switches, TCP/IP routers, and media converters
- SCALANCE W Industrial Wireless LAN components
- SCALANCE S612 and S613 industrial security modules
- Dedicated line accessories
- Cables
- SINAUT ST7 engineering software, comprising:
  - SINAUT TD7 library with blocks for the data point objects of the SIMATIC S7 CPU or the TIM module
  - SINAUT ST7 engineering package for configuration of stations, networks and connections as well as for diagnostics

Network topologies

In order to configure complete, hierarchical telecontrol networks, it is possible to configure basic topology forms such as point-to-point, multipoint, star and ring in various media versions and to combine them depending on the infrastructure requirements.

Examples of media versions:

- Private networks
  - Wireless
  - Dedicated line
  - WLAN
- Public networks
  - GPRS
  - EGPRS
  - UMTS
  - DSL

To achieve redundant data transmission, it is also possible to connect an outstation via two transmission paths to the control center in the SIMATIC PCS 7 process control system or to a node station. It is irrelevant whether the two paths are based on the same medium or on different media.
Design (continued)

Example of redundant SINAUT ST7 telecontrol connections (point-to-point topology)

Further examples of possible telecontrol configurations as well as information on protocols and operating modes can be found in Catalog IK PI, Section "Telecontrol", and in the SIMATIC PCS 7 TeleControl brochure.

Function

Up to 10,000 stations can be addressed with SINAUT ST7. Information on the source and target addresses is included in the message frames.

Special characteristics of SINAUT ST7 communication:

Data transmission only following changes
- Change-driven transmission of process data between RTUs as well as between RTU and control center
- Signaling of failures in connection, RTU or control center
- Automatic data updating for all communication partners involved following troubleshooting and following the startup of an RTU or control center

Chronological processing of process data
- Time tagging of all data frames at the place of origin allows process data to be archived by the process control system in the correct chronological order
- The time of the SINAUT ST7 stations in the WAN can be synchronized via SIMATIC PCS 7 (including summertime/wintertime switchover)

Data storage on site
- During the failure of the connection or the communication partner, the TIM communication module can temporarily store (for several hours or even days) up to 60,000 events (depends on the version)
- Intermediate storage of message frames of lower priority in the case of priority-controlled data transmission (with dial-up networks or quantity-dependent data transmission costs)

Remote programming and diagnostics
- Remote diagnostics and remote programming over the WAN using the "PG routing" function
- PG routing shares the available bandwidth with the process data transmission, but has a higher priority
- Uploads, downloads, remote diagnostics, firmware upgrades or changes in automation functions on the stations can be carried out online from the control center in SIMATIC PCS 7

Alarm output per text message
- The RTUs can send text messages depending on events in order to alarm personnel on call
- Receipt of messages can be acknowledged from a mobile phone
- Depending on the services offered by the mobile radio provider, the text message can also be output as an e-mail, fax or voice mail
Function (continued)

Modes
The communication mode between the control center and RTU depends on the telecontrol protocol, the type of WAN, and the telecontrol configuration.

The SINAUT ST7 telecontrol protocol supports the following operating modes:

Polling
• Control of data exchange by the TIM module of the control center
• The TIM of the control center calls the outstations and node stations one after the other
• Stations with modified data (since the last transmission) send this when called
• Stations without modified data only acknowledge the call
• Transmission of control center data to the stations in between the calls
• Data exchange using internode communication between the stations is possible via the polling TIM of the control center

Polling with time slot procedure
• Operating mode for a radio network with division of the radio frequency between several providers
• Typically 6 s/min (time slot) for each provider for data exchange
• Data exchange during the time slot is carried out as described under "Polling"
• Following the data exchange, the frequency swaps to the next provider
• Data exchange using internode communication between the stations is possible via the polling TIM of the control center
• Control of the polling TIM by DCF77 or GPS radio-controlled clock for exact observation of the time slot

Spontaneous mode in dial-up networks
• Data from outstations and node stations can be assigned priorities for transmission in the dial-up network: normal, high, alarm
• Immediate establishment of a dial-up connection for data with alarm priority or high priority; priority transmission of alarm frames
• Intermediate storage of data with normal priority; transmission during the next dial-up connection with the partner in the original chronological order (FIFO principle)
• Transmitted data from the control center always has high priority
• Data exchange possible between the stations with direct internode communication

Spontaneous mode in the TCP/IP-based WAN
• Establishment of a permanent S7 connection between two TIMs or between TIM and control center
• Exchange of SINAUT ST7-specific data packets via this S7 connection using S7 communication functions with application of the TCP/IP transport protocol
• If the data transmission costs are related to the data quantity, processing is carried out with priority as with spontaneous mode in dial-up networks: immediate transmission of data with high priority and alarm priority (latter with priority); collection of data with normal priority and transmission in larger blocks
• If the data quantity is not cost-relevant, all data is transmitted immediately to the respective partner, i.e. without intermediate storage. Message frames with alarm priority then have priority.

More information
Detailed information on telecontrol with SINAUT ST 7 as well as ordering data and technical data of suitable telecontrol components can be found in Chapter "Telecontrol" of Catalog IK PI.
You can find additional information in the Internet at: www.siemens.com/telecontrol
**Overview**

Widely distributed outstations (Remote Terminal Units) can be controlled and monitored with the DNP3 telecontrol protocol via serial or Ethernet TCP/IP communication links from a telecontrol center in SIMATIC PCS 7.

The control center integrated with SIMATIC PCS 7 TeleControl into the operator system of the process control system is the master during telecontrol communication. The Remote Terminal Units (RTUs) represent its “slaves”.

**Note:**

Telecontrol with DNP3 is possible together with SIMATIC PCS 7 TeleControl V7.1 and SIMATIC PCS 7 V7.1 (SP2 and higher in each case).

---

**Design**

The following types of RTU are suitable as outstations in telecontrol applications with the DNP3 telecontrol protocol:

- SIMATIC S7-300/S7-300F controller (up to approx. 100 I/Os)
- SIMATIC S7-400/S7-400F controller (up to approx. 500 I/Os)
- SIMATIC S7-400H/S7-400FH controller (up to approx. 500 I/Os)
- Third-party RTUs

Further hardware and software components from the Catalog IK PI round off the Siemens product range for configuration of DNP3 telecontrol applications:

- TIM communication modules
- TCP/IP converters – serial and MD modem modules
- Mobile radio components
- Industrial Ethernet switches, TCP/IP routers, and media converters
- SCALANCE W Industrial Wireless LAN components
- SCALANCE S612 and S613 industrial security modules
- Dedicated line accessories
- Engineering package for configuration of DNP3 data objects, stations, networks and connections as well as for diagnostics

**Network topologies**

In order to configure complete, hierarchical telecontrol networks, it is possible to configure basic topology forms such as point-to-point, multipoint, star or ring in various media versions and to combine them depending on the infrastructure requirements.

**Examples of media versions**

- Private networks:
  - Wireless
  - Dedicated line
  - WLAN
- Public networks:
  - GPRS
  - EGPRS
  - UMTS
  - DSL

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Example of secure TCP/IP-based connection over the Internet via DSL (star topology)

To permit redundant data transmission, RTUs can be connected to the control center in the SIMATIC PCS 7 process control system over two paths. It is irrelevant whether the two paths are based on the same medium or on different media.

Further examples of possible telecontrol configurations as well as information on protocols and operating modes can be found in Catalog IK PI, Section "Telecontrol", and in the SIMATIC PCS 7 TeleControl brochure.

### Function

**Special characteristics of DNP3 communication**

- Data transmission only following changes
- Change-driven transmission of process data between RTU and control center
- Signaling of failures in connection, RTU or control center
- Automatic data updating for all communication partners involved following troubleshooting and following the startup of the RTU or control center

**Chronological processing of process data**

- Time tagging of all data frames at the place of origin allows process data to be archived by the process control system in the correct chronological order
- The time of the DNP3 stations in the WAN can be synchronized via SIMATIC PCS 7 (including summertime/wintertime switchover)

### Data storage on site

- During the failure of the connection or the communication partner, the TIM communication module can temporarily store (for several hours or even days) up to 200,000 events
- Intermediate storage of message frames of lower priority in the case of priority-controlled data transmission, e.g. with quantity-dependent data transmission costs

### Modes

The communication mode between the control center and RTU depends on the telecontrol protocol, the type of WAN, and the telecontrol configuration.

The DNP3 telecontrol protocol supports the following operating modes (functional principle similar to that described in the section "Telecontrol with SINAUT ST7"):

- Polling
- Polling with time slot procedure
- Spontaneous mode in the TCP/IP-based WAN

### More information

Detailed information on telecontrol with DNP3 as well as ordering data and technical data of suitable telecontrol components can be found in Chapter "Telecontrol" of Catalog IK PI.

You can find additional information in the Internet at:

www.siemens.com/telecontrol
Industry-specific applications
Telecontrol - SIPLUS RIC
Telecontrol connection to control center in SIMATIC PCS 7

Overview

Flexible communication options with SIPLUS RIC in a wide area network (WAN)

The telecontrol communication between a telecontrol center integrated in SIMATIC PCS 7 and its outstations (Remote Terminal Units) is based on SIPLUS RIC bundles and is possible via serial communication links and also over Ethernet TCP/IP communication links – optionally with the telecontrol protocols

- IEC 870-5-104 (Ethernet TCP/IP)
- IEC 870-5-101 (serial)
- Modbus (Ethernet TCP/IP or serial)

The telecontrol center integrated with SIMATIC PCS 7 TeleControl into the operator system of the process control system is the master during telecontrol communication. The Remote Terminal Units (RTUs) are slaves of the control center on the one hand, but, with a protocol expansion, can additionally be masters for subordinate outstations (IEC 870-5-101/-104/-103 slaves).

Note:
Telecontrol with SIPLUS RIC on the basis of the IEC 870-5-104, IEC 870-5-101 and Modbus protocols is possible in combination with SIMATIC PCS 7 TeleControl V7.1 and SIMATIC PCS 7 V7.1.
Industry-specific applications

Telecontrol - SIPLUS RIC

Telecontrol connection to control center in SIMATIC PCS 7

Design

IEC 670-5-101/IEC 670-5-104 telecontrol protocol

The following types of RTU are suitable as outstations in telecontrol applications with the IEC 870-5-101 (serial) or IEC 870-5-104 (Ethernet TCP/IP) telecontrol protocol:

- Controller integrated in SIMATIC ET 200S (up to approx. 30 I/Os and approx. 200 information points)
- SIMATIC S7-300/S7-300F controller (up to approx. 100 I/Os and approx. 2 000 information points)
- SIMATIC S7-400/S7-400F controller (up to approx. 500 I/Os and approx. 5 000 information points)
- SIMATIC S7-400H/S7-400FH controller (up to approx. 500 I/Os and approx. 5 000 information points)
- Third-party RTUs

The SIPLUS RIC product range comprises individual libraries for telecontrol protocols as well as cost-effective SIPLUS RIC bundles in which the SIMATIC controller and the telecontrol protocol for an RTU are combined together. Further information can be found in the section "SIPLUS RIC bundles".

Advantages of the TCP/IP-based connection through IEC 60870-5-104 are simultaneous data transfer to several devices and simultaneous diagnostics using SIMATIC Manager.

Security mechanisms are not defined in the application area of IEC 60870-5-104. Therefore encryption of the user data (data integrity) and authentication of the communication partners must be implemented separately (Industrial Security).

Hardware and software components from Catalog IK PI supplement the SIPLUS RIC product range for configuration of IEC 870-5-101/104 telecontrol applications, e.g.:

- TCP/IP converters – serial and MD modem modules
- Mobile radio components
- Industrial Ethernet switches, TCP/IP routers, and media converters
- SCALANCE W Industrial Wireless LAN components
- SCALANCE S612 and S613 industrial security modules
- Dedicated line accessories
- Cables

Network topologies

In order to configure complete, hierarchical telecontrol networks, it is possible to configure basic topology forms such as point-to-point, multipoint, star and ring in various media versions and to combine them depending on the infrastructure requirements.

Examples of media versions

- Private networks
  - Wireless
  - Dedicated line
  - WLAN
- Public networks
  - GPRS
  - EGPRS
  - UMTS
  - DSL

Example of complex TCP/IP-based WAN with cable and GPRS networks
Design (continued)

Redundancy

The availability of the telecontrol communication can be improved by connecting the RTU over two paths to the control center in the process control system. The two redundant transmission paths can be based on the same or different communication protocols.

The use of redundant RTUs of type S7-400H (fault-tolerant) or S7-400FH (safety-related and fault-tolerant) results in further possibilities for increasing the availability, e.g. the redundant design of telecontrol communication, fieldbus and process I/O. As a result of the seamless integration of the telecontrol system in the SIMATIC PCS 7 process control system, its implementation depends on the redundancy concept of the complete system (see example of redundant telecontrol configuration with the IEC 870-5-101/104 telecontrol protocols).

Modbus telecontrol protocol

The following types of RTU are suitable as outstations in telecontrol applications with the Modbus telecontrol protocol (serial or Ethernet TCP/IP):
- Controller integrated in SIMATIC ET 200S (up to approx. 30 I/Os)
- SIMATIC S7-300/S7-300F controller (up to approx. 100 I/Os)
- SIMATIC S7-400/S7-400F controller (up to approx. 500 I/Os)
- Third-party RTUs

The SIPLUS RIC product range comprises individual libraries for telecontrol protocols as well as cost-effective SIPLUS RIC bundles in which the SIMATIC controller and the telecontrol protocol for an RTU are combined together. Further information can be found in the section “SIPLUS RIC bundles”.

Hardware and software components from Catalog IK PI supplement the SIPLUS RIC product range for configuration of Modbus telecontrol applications, e.g.:
- TCP/IP converters – serial and MD modem modules
- Mobile radio components
- Industrial Ethernet switches, TCP/IP routers, and media converters
- SCALANCE W Industrial Wireless LAN components
- Dedicated line accessories
- Cables

Network topologies

The Modbus telecontrol protocol can be used to implement telecontrol networks based on point-to-point and multi-point topologies, both serial and Ethernet TCP/IP. Various media versions can be used for private and public networks, e.g.:
- Private networks:
  - Wireless
  - Dedicated line
  - WLAN
- Public networks:
  - GPRS
  - EGPRS
  - UMTS
  - DSL

Interfacing of SIPROTEC protective equipment

The protocol expansion IEC 870-5-103 Master for SIPLUS RIC bundles also allows interfacing of SIPROTEC protective equipment via SIMATIC PCS 7 TeleControl. The RTU (S7-400/ S7-300/ET 200S with CPU) then serves as a converter between the IEC 870-5-103 protection data protocol and the IEC 870-5-101 or IEC 870-5-104 protocol.

Compared to PROFIBUS DP interfacing of the protective equipment, this configuration provides the following advantages:
- Greater distances are possible
- The highly exact time stamps are transferred from the protective equipment to the control system.
**Design (continued)**

Example of telecontrol configuration with the Modbus telecontrol protocol (Ethernet TCP/IP and serial)

To permit redundant data transmission, RTUs can be connected to the control center in the SIMATIC PCS 7 process control system over two paths. Two operating modes are available:

- Load sharing: parallel utilization of both paths
- Master/standby: only one path is active, the other is passive

**SIPLUS RIC bundles**

Components of a SIMATIC controller type (S7-300, S7-400 etc.) are combined with the library for a telecontrol protocol in SIPLUS RIC bundles for RTUs.

The SIPLUS RIC bundles configured as "Slave" for the telecontrol interface usually consist of:

- CPU
- Interface/communication module
- Memory card
- CD with library and registration code

In the version "SIPLUS RIC Extreme", they are also suitable for operation under exceptional conditions, e.g. ambient temperatures from -25 to +70 °C, condensation or extraordinary medial loads.

The performance of the uniform telecontrol technology can be scaled as follows with the SIPLUS RIC bundles:
Industry-specific applications

Telecontrol - SIPLUS RIC

Telecontrol connection to control center
in SIMATIC PCS 7

Function

Telecontrol communication with SIPLUS RIC is characterized by the following features:

- Uniform configuration using the SIMATIC Manager
- Event-driven data transfer
- Monitored output of commands for reliable detection of malfunctions
- Diagnostics functions for rapid tracing and elimination of faults
- High availability thanks to redundant data communication

Additional special features of the IEC 870-5-101 and IEC 870-5-104 telecontrol protocols include:

- Time stamping for data acquisition in the outstation
- Data buffering for bridging communication breaks:
  - RTU of type SIMATIC ET 200S: up to 800 events
  - RTU of type SIMATIC S7-300/S7-300F: up to 3,200 events
  - RTU of type SIMATIC S7-400/S7-400F/S7-400H/S7-400FH: up to 3,200 events
- Time synchronization via the control center

Selection and ordering data

### SIPLUS RIC IEC 870-5-101/-104 bundles for the telecontrol connection to control center in SIMATIC PCS 7

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Bundles with SIMATIC ET 200S (CPU integrated) for up to approx. 200 information points</th>
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<tr>
<td>SIPLUS RIC ET 2005 bundle T101 SL IM151-7 CP1</td>
<td>SIPLUS RIC IEC 870-5-101 slave with SIMATIC IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 485 interface</td>
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<table>
<thead>
<tr>
<th>Order No.</th>
<th>Extreme bundles with IEC 870-5-101 telecontrol protocol (serial)</th>
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<tbody>
<tr>
<td>6AG6 003-5BA00-1BA0</td>
<td>SIPLUS RIC ET 2005 Extreme bundle T101 SL IM151-7 CP1 SIPLUS RIC IEC 870-5-101 slave with SIPLUS IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 485 interface</td>
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<thead>
<tr>
<th>Order No.</th>
<th>SIPLUS RIC ET 2005 bundle T101 SL IM151-8 CP1</th>
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<table>
<thead>
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<th>Extreme bundles with IEC 870-5-104 telecontrol protocol (TCP/IP)</th>
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<td>SIPLUS RIC ET 2005 Extreme bundle T104 SL IM151-8 PN/DP SIPLUS RIC IEC 870-5-104 slave with SIMATIC IM 151-8 PN/DP CPU incl. 128 KB Micro Memory Card</td>
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<th>Order No.</th>
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<td>SIPLUS RIC ET 2005 Extreme bundle T104 SL IM151-8 PN/DP</td>
<td>SIPLUS RIC IEC 870-5-104 slave with SIPLUS IM 151-8 PN/DP CPU incl. 128 KB Micro Memory Card</td>
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- Subject to export regulations AL: N and ECCN: EAR99H

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## Industry-specific applications

### Telecontrol - SIPLUS RIC

#### Telecontrol connection to control center

in SIMATIC PCS 7

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<th>Ordering data</th>
<th>Order No.</th>
<th>Order No.</th>
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<tr>
<td>Runtime software and electronic documentation, 2 languages (German, English), software class A, single license for 1 installation</td>
<td>Standard bundles with IEC 870-5-104 telecontrol protocol (TCP/IP)</td>
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<tr>
<td>SIPLUS RIC S7-300 bundle T101 SL CPU314 CP340</td>
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<td>SIPLUS RIC S7-300 bundle T104 SL CPU314 CP343-1</td>
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<td>SIPLUS RIC S7-300 bundle T104 SL CPU319-3 PN/DP</td>
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<td>SIPLUS RIC IEC 870-5-101 slave with SIMATIC S7-CPU 315-2 PN/DP incl. 2 MB Micro Memory Card</td>
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<td>SIPLUS RIC S7-300 Extreme bundle T104 SL CPU315 PN/DP</td>
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<td>SIPLUS RIC IEC 870-5-101 slave with SIPLUS S7-CPU 314 incl. 128 KB Micro Memory Card, CP 340 with RS 232 interface</td>
<td>SIPLUS RIC IEC 870-5-104 slave with SIPLUS S7-CPU 314 incl. 128 KB Micro Memory Card</td>
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<td>SIPLUS RIC S7-300 Extreme bundle T101 SL CPU315 CP341</td>
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<td>SIPLUS RIC S7-300 Extreme bundle T104 SL CPU317 PN/DP</td>
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<td>SIPLUS RIC IEC 870-5-101 slave with SIPLUS S7-CPU 315 incl. 512 KB Micro Memory Card, CP 341 with RS 232 interface</td>
<td>SIPLUS RIC IEC 870-5-104 slave with SIPLUS S7-CPU 315-2 PN/DP incl. 512 KB Micro Memory Card</td>
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## Ordering data

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<tr>
<td>Runtime software and electronic documentation, 2 languages (German, English), software class A, single license for 1 installation</td>
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<td>Standard bundles with IEC 870-5-101 telecontrol protocol (serial)</td>
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<td>SIPLUS RIC IEC 870-5-101 slave with SIMATIC S7-CPU 412-1 incl. 256 KB Memory Card, CP 441-1 with one RS 232 interface</td>
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<td>SIPLUS RIC S7-400 bundle T104 SL CPU412-1 CP443-1</td>
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<td>SIPLUS RIC PCS 7 library</td>
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<td>SIPLUS RIC protocol expansion</td>
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<td>Additional registration IEC 870-5-103 master for one S7-400 automation system; communication via CP 441</td>
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**Note:** Software activation by phone

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**I:** Subject to export regulations AL: N and ECCN: EAR99H

**J:** Subject to export regulations AL: N and ECCN: EAR99S

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**SIPLUS RIC Modbus bundles for telecontrol connection to control center in SIMATIC PCS 7**

On request; see section "Further information" for contact address
Industry-specific applications

Telecontrol - SIPLUS RIC

Telecontrol connection to third-party control center

Overview
If it is the case that a SIMATIC PCS 7 system has to communicate with a remote control center of a third-party supplier using the IEC 870-5 telecontrol standard, the IEC 870-5-101 (serial) and IEC 870-5-104 (TCP/IP) telecontrol protocols can be implemented in the SIMATIC PCS 7 automation systems.

The IEC 870-5-101 protocol permits use of classic WAN connections over modems and dedicated lines. The IEC 870-5-104 protocol supports TCP/IP-based WAN connections such as Internet/DSL or GPRS.

Application
Possible fields of application include:
- Interfacing of power plant automation based on SIMATIC PCS 7 to network control centers for power distribution
- Interfacing of pumping and compressor stations automated using SIMATIC PCS 7 to higher-level control centers for gas, oil or water pipelines

Design

Telecontrol connection for single SIMATIC PCS 7 automation systems (single station)

Supervisory Control System (telecontrol center) separate from SIMATIC PCS 7

Depending on the protocol, either the CP 441 (IEC 870-5-101) or CP 443-1EX20 (IEC 870-5-104) is used as the communication module in the automation system.

The materials required to design a telecontrol link, e.g. TCP/IP router, CP 443-1EX20, CP 441-1, dedicated line modem, cables etc., are accessories which are not included in this catalog.

In the SIMATIC PCS 7 automation system, additive driver blocks from the SIPLUS RIC PCS S7 library carry out the interface adaptation for communication using the IEC 870-5-101 or IEC 870-5-104 standardized protocols. As usual with SIMATIC PCS 7, configuration is carried out using the SIMATIC Manager. This equally applies to automation systems designed as single station or redundant station.

Note:
The blocks of the SIPLUS RIC PCS 7 library can be used together with automation systems from the SIMATIC PCS 7 V7 process control system. With the telecontrol configurations described here for connection of SIMATIC PCS 7 automation systems to a third-party control center, use of the SIPLUS RIC PCS 7 library is independent of SIMATIC PCS 7 TeleControl.
Telecontrol connection for redundant SIMATIC PCS 7 automation systems (redundant station)

Redundant configuration with IEC 870-5-101 telecontrol protocol (serial)

The control center is linked via a serial telecontrol connection with IEC 870-5-101 protocol to a CP 340 or CP 341 in an ET 200M station of the SIMATIC PCS 7 system.

If the master system fails, the standby system of the redundant automation system takes over data exchange with the control center bumpless via the CP 341 in the ET 200M station.

Failure of the master system can be signaled to the control center.

Redundant configuration with IEC 870-5-104 telecontrol protocol (TCP/IP)

Configuration example of the telecontrol connection of redundant SIMATIC PCS 7 AS 412H/AS 414H/AS 417H with the IEC 870-5-104 telecontrol protocol
Industry-specific applications

Telecontrol - SIPLUS RIC

Telecontrol connection to third-party control center

**Design (continued)**

- The control center is linked via a TCP/IP-based WAN to the SIMATIC PCS 7 system bus.
- The control center establishes a TCP/IP connection to an AS subsystem with each of the two CP 443-1EX20 via which the redundant automation system is integrated into the system bus.
- The control center starts the IEC 870-5-104 telecontrol protocol via the TCP/IP connection to the master system and monitors the TCP/IP connection to the standby system using test frames.
- If the master system fails, the control center signals the associated connection as being faulty, and starts the IEC 870-5-104 telecontrol protocol via the TCP/IP connection to the standby system. It then attempts to reestablish the faulty connection.

**Selection and ordering data**

<table>
<thead>
<tr>
<th>SIPLUS RIC PCS 7 library</th>
<th>Order No.</th>
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<tr>
<td>Runtime software for one automation system, 2 languages (German, English), software class A, single license for 1 installation</td>
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**SIPLUS RIC PCS 7 software T101 SL CP441**
- Function block library for telecontrol protocol IEC 870-5-101 slave, suitable for S7-400, CP 441 interface

**SIPLUS RIC PCS 7 software T101 SL CP340/1**
- Function block library for telecontrol protocol IEC 870-5-101 slave, suitable for S7-400/S7-400H, CP 340/341 interface

**SIPLUS RIC PCS 7 software T104 SL CP443**
- Function block library for telecontrol protocol IEC 870-5-104 slave, suitable for S7-400/S7-400H, CP 443-1 interface

**More information**

As a specialist for complete solutions in the product and system business, we would be pleased to advise you concerning generation of an individual configuration and the selection of accessories. If required, we can also supply preconfigured bundles or turnkey outstations installed in wall enclosures, cabinets or containers. Contact address for quotation and consulting:

Siemens AG
Würzburger Str. 121
90766 Fürth
Germany

Phone: +49 911 750 - 4790
Fax: +49 911 750 - 9917

E-mail: siplus-ric.automation@siemens.com

You can find additional information in the Internet at:

www.siemens.com/siplus-ric
Overview

Through application of the Process Analytical Technology (PAT) initiated by the Food & Drug Administration you can design, analyze, optimize and control product development processes and production processes on the basis of up-to-date measurements of critical quality and performance attributes of raw materials, process materials and procedures so that the quality required for the end product can be absolutely guaranteed.

If you use PAT, you can meet the following requirements:

- Gaining of comprehensive knowledge concerning the product and its development process
- Determination of relevant factors influencing the quality of the end product from the recorded product and process data
- Estimation of the end product quality through continuous analysis of the influencing factors
- Depending on the result of the analysis: early introduction of closed-loop control measures for safeguarding the quality of the end product
- Safeguarding of consistent product quality when upscaling the process from laboratory operation to production and when changing production quantities
- Validation of process in accordance with statutory directives
- Improvement of total performance of the process

Real-time tracking of parameters relevant to product quality not only helps you to understand and control the total process better, it also helps to reduce or even completely eliminate final inspections. The preparation of samples for quality control at the end of the process (which can sometimes be extremely time-consuming) or for follow-up checks can thus be omitted.

The results obtained with PAT during product development in the laboratory can be easily upscaled to production mode. The production quantities can be rapidly and flexibly adapted to changing market requirements while keeping the quality.

All these features result in very short product development and launch times with significant cost advantages.

SIMATIC SIPAT from Siemens is the appropriate software platform for integration of PAT in the process industry. PAT can then be integrated into existing or new infrastructures. These can feature SCADA/process control systems (optionally with batch automation), Manufacturing Execution Systems (MES), Enterprise Resource Planning Systems (ERP), Laboratory Information Management Systems (LIMS), data portals, knowledge management systems, etc. Linking to the SIMATIC PCS 7 process control system by means of OPC.

Important features of SIMATIC SIPAT:

- Modular, scalable architecture with uniform interfaces for process analyzers and data mining applications
- Can be integrated into existing or new infrastructures
- Data recording: recording of product and process data using standard analyzers
- Data mining: data evaluation and determination of relevant quality parameters, for example, through modeling and validation with multivariate data analysis (MVDA)
- Real-time prediction of quality parameters
- Continuous monitoring and control of product quality
- Online visualization, report functions, and analysis of historical data
- Support for simple and fast process validation
- Audit functionality for compliance with statutory directives
- Conformity with the directives defined in 21 CFR Part 11 with regard to version management, saving of raw data, and access privileges

Note:
The current software SIMATIC SIPAT V3.1 can be used in combination with SIMATIC PCS 7 V7.1.
Industry-specific applications

Process Analytical Technology

SIMATIC SIPAT: Optimization of product development and production

Benefits

Application of Process Analytical Technology (PAT) with SIMATIC SIPAT allows you to considerably increase the effectiveness and profitability of processes in the laboratory and during production.

The numerous advantages that you gain by using SIMATIC SIPAT are categorized as follows:

- Considerable cost reductions
  - Avoidance of rejects/reworking
  - Reduced stocks of raw materials, intermediate products and end products
  - Reduction in offline laboratory costs
  - Flexible adaptation of production quantities depending on demand
- Better quality and overall performance
  - Product approval in real-time
  - Guaranteed, uniformly high product quality
  - Higher product yield
  - Reduced risk of recalls
  - Minimized danger of contamination
- Shorter development and product launch times
  - Improvement in efficiency through operative excellence
  - Simpler compliance with statutory directives through optimization of validation
  - Easier and faster process scalability
  - Easier and faster transfer from one system to another
- Strengthening and improving the competitive position
  - Winning of market shares through faster product development and launching
  - Process patenting secures a lead over the competition
- Image upgrading
  - Innovative product/production technologies
  - Compliance with legislation
  - Impressive process knowledge
  - Minimization of risk of recalls, warning notifications or declarations of consent

Application

SIMATIC SIPAT V3.1 is recommended primarily for use in the following industries:
- Pharmaceutical industry
- Fine chemicals
- Food, beverages and tobacco industries
- Paper and cellulose industries

Design

Example of a distributed SIMATIC SIPAT architecture

The software supplied on the SIMATIC SIPAT V3.1 DVD is structured as follows:

SIMATIC SIPAT Central Database
Central relational database which contains both configuration and runtime data.

SIMATIC SIPAT Station Service
Windows service for execution of methods (data collection, matching, calculation).

SIMATIC SIPAT Productivity Pack
Uniform interface for integration of analyzers in SIMATIC SIPAT.
In combination with the device manufacturer’s software, allows parameterization, calibration and control of these devices in addition to data acquisition.

SIMATIC SIPAT Watchdog Service
Windows service for monitoring the availability of individual SIMATIC SIPAT stations.

SIMATIC SIPAT Data Logger Service
Windows service for saving runtime data (writing in central SIMATIC SIPAT database, buffering in event of power failure)

SIMATIC SIPAT Workflow Service
Windows service for online execution of workflows for parameterization/calibration of analyzers and for preparation of SIMATIC SIPAT methods.

SIMATIC SIPAT Umetrics Server
Windows service for online execution of models of the following Umetrics software products:
- Umetrics SIMCA QP+ (incl. V12.0.1)
- Umetrics SIMCA P+ (incl. V12.0.1)
- Umetrics SBOL

SIMATIC SIPAT CAMO Server
Windows service for online execution of models of the following CAMO software products:
- Camo Unscrambler OLUP
- Camo Unscrambler OLUC
**Design (continued)**

SIMATIC SIPAT Matlab Server

Windows service for online execution of the Matlab models:

**SIMATIC SIPAT Client**

SIMATIC SIPAT user interface for access to data of the SIMATIC SIPAT database. With it you can:

- Configure SIMATIC SIPAT methods and create the required chemometric models.
- Control and visualize execution of the methods.

**SIMATIC SIPAT OPC Services (Automation Service, Writer Service, Alarm Service)**

Windows services for OPC data exchange with SCADA/process control systems (DCS), e.g. SIMATIC PCS 7

**SIMATIC SIPAT Archiver Service**

Windows service for long-term archiving of SIPAT runtime data in an XML file. Archived data can be removed from the runtime database (SIMATIC SIPAT Central Database).

**SIMATIC SIPAT Report Manager Server**

Web server with Business Objects XI for reporting based on SIMATIC SIPAT data.

This distributed software structure can be flexibly mapped on different PC-based hardware configurations (e.g. SIMATIC Industrial PC) depending on the process size and customer requirements.

All software components can be executed on a SIMATIC Industrial PC (IPC). However, because of the improved performance, distributed IPC architectures are characteristic of SIMATIC SIPAT V3.1 (see example of a distributed SIMATIC SIPAT architecture).

The following table shows the hardware assignment of the software components for the recommended SIMATIC SIPAT V3.1 architecture:

<table>
<thead>
<tr>
<th>Hardware component (IPC) - functional name</th>
<th>SIMATIC SIPAT software component</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC SIPAT Database Server</td>
<td>SIMATIC SIPAT Central Database</td>
<td>MS SQL and Oracle are supported; Oracle must be executed on a Windows server.</td>
</tr>
<tr>
<td>SIMATIC SIPAT Base Station</td>
<td>SIMATIC SIPAT Station Service</td>
<td>Typically for up to four methods</td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Productivity Pack</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Watchdog Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Data Logger Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Workflow Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Umetrics Server</td>
<td>Can also be installed on a separate Chemometrics server; one SIMATIC SIPAT Umetrics/Camo/Matlab server per basic operation is preferred.</td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT CAMO Server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Matlab Server</td>
<td></td>
</tr>
<tr>
<td>SIMATIC SIPAT Collector Station</td>
<td>SIMATIC SIPAT Productivity Pack</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Watchdog Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC SIPAT Workflow Service</td>
<td></td>
</tr>
<tr>
<td>SIMATIC SIPAT Client Station</td>
<td>SIMATIC SIPAT Client</td>
<td></td>
</tr>
<tr>
<td>SIMATIC SIPAT OPC Server</td>
<td>SIMATIC SIPAT OPC Services</td>
<td>Known DCOM properties can be avoided if the SIMATIC SIPAT OPC Services are installed on the OPC server; they can also be installed on an existing OPC server.</td>
</tr>
<tr>
<td>SIMATIC SIPAT Archive Server</td>
<td>SIMATIC SIPAT Archiver Service</td>
<td>Can also be installed on an existing archive server.</td>
</tr>
<tr>
<td>SIMATIC SIPAT Web Server</td>
<td>SIMATIC SIPAT Report Manager Server</td>
<td>Can also be installed on an existing Web server.</td>
</tr>
<tr>
<td>SIMATIC SIPAT Chemometrics Server</td>
<td>SIMATIC SIPAT Umetrics Server, SIMATIC SIPAT CAMO Server or SIMATIC SIPAT Matlab Server</td>
<td>Alternative, customer-specific</td>
</tr>
</tbody>
</table>
Industry-specific applications
Process Analytical Technology

**SIMATIC SIPAT: Optimization of product development and production**

### Design (continued)

Other possibilities for flexible adaptation to the technological process result from the license model which is fixed in the product range of SIMATIC SIPAT V3.1. It is defined as follows:

**SIMATIC SIPAT Basic Package**

The SIMATIC SIPAT Basic Package bundles a SIMATIC SIPAT Basic Package license and a SIMATIC SIPAT Model Builder license. In contrast to the full license (four simultaneously executed methods), the license of the SIMATIC SIPAT Basic Package in the SIMATIC SIPAT Basic Package is limited to one simultaneously executed method.

**SIMATIC SIPAT Basic Package PowerPack**

The SIMATIC SIPAT Basic Package PowerPack license expands the SIMATIC SIPAT Basic Package license to a full license (up to four simultaneously executed methods).

**SIMATIC SIPAT Productivity Pack (Analyser Type/Analyser)**

The SIMATIC SIPAT Productivity Pack integrates analyzers via uniform interfaces, so-called instrument collectors, in SIMATIC SIPAT. The instrument collectors are used for bidirectional data exchange with analyzers. They use device software and interfaces of the device manufacturers (manufacturer’s software license required).

Each instrument collector of a particular type serves as a driver for the individual instruments of this type. Instrument collectors for the following types of device are currently available:

- ABB Bomem
- Bruker OPUS
- Bruker Lancir
- Dr. Schleuniger / Bruker Tandem
- Malvern Insitec Particle Size
- Malvern Morphology
- Thermo Fisher Antaris
- Kaiser Optics
- Granumet XP
- Malvern Morphology
- Brimrose Luminar
- Expo ePAT601
- Carl Zeiss 500/600

**SIMATIC SIPAT Report Manager Server**

The SIMATIC SIPAT Report Manager Server license permits use of the SIMATIC SIPAT data for reporting with Business Objects XI.

**SIMATIC SIPAT Report Manager Universe Customizer**

The SIMATIC SIPAT Report Manager Universe Customizer license permits customized adaptation of reporting with Business Objects.

**SIMATIC SIPAT Productivity Pack Reporting**

Together with the SIMATIC IT Report Manager Server or a Business Object full license, the Productivity Pack Reporting license expands the functionality for SIMATIC SIPAT reporting.

**SIMATIC SIPAT Report Manager Client**

The SIMATIC SIPAT Report Manager Client license is used to present SIMATIC SIPAT reports with the Internet Explorer. The license available in the following two versions allows clients to have simultaneous access to the SIMATIC SIPAT Report Manager Server:

- 1 concurrent client
- 10 concurrent clients

**SIMATIC SIPAT Lab/Line License**

The SIMATIC SIPAT Lab/Line License combines all SIMATIC SIPAT licenses required for a laboratory or a plant section (process cell in accordance with ISA-88) with the exception of the following licenses for reporting:

- SIMATIC SIPAT Report Manager Server
- SIMATIC SIPAT Report Manager Universe Customizer
- SIMATIC SIPAT Productivity Pack Reporting
- SIMATIC SIPAT Report Manager Client (1 or 10 concurrent clients)

**SIMATIC SIPAT Site License**

The SIMATIC SIPAT Site License combines all SIMATIC SIPAT licenses required for a factory (in accordance with ISA-88) with the exception of the following licenses for reporting:

- SIMATIC SIPAT Report Manager Server
- SIMATIC SIPAT Report Manager Universe Customizer
- SIMATIC SIPAT Productivity Pack Reporting
- SIMATIC SIPAT Report Manager Client (1 or 10 concurrent clients)
## Function

### Important functions of SIMATIC SIPAT V3.1:

#### Data acquisition

**Recording of process analysis data**

SIMATIC SIPAT can be used together with various analyzers to record product and process data. Depending on the device-specific functions and the software support provided by the manufacturer, SIMATIC SIPAT cannot just be used for data acquisition, but also for configuration of the analyzer, including calibration and system performance test.

**Receipt/reading of data and data distribution**

SIMATIC SIPAT uses open technologies based on industrial standards for data exchange with external systems, for example, with the SIMATIC PCS 7 process control system. SIMATIC SIPAT can read in process parameters such as temperature, pressure or pH value for application in a PAT procedure via an OPC interface. OPC communication can also be used to inform SIMATIC SIPAT about the beginning or end of a batch, procedure or phase.

In addition to the online data of analyzers and the SIMATIC PCS 7 process control system, SIMATIC SIPAT can also use quality parameters from ERP systems, LIMS systems such as SIMATIC IT Unilab, or MES systems such as the SIMATIC IT Production Suite, such as the results of a raw material analysis.

**Device calibration and system performance test**

The performance of analyzers is usually checked before they are put into use. SIMATIC SIPAT takes this workflow into account, and triggers a calibration or a system performance test on the basis of internal or external standards. For tracking purposes, SIMATIC SIPAT saves the results as well as other data recorded with this device.

#### Data mining

**In one client application, the Data Miner combines the functionality of the model builder with that of the data browser for displaying all method data at runtime. The Data Miner enables you to preprocess and evaluate product and process data recorded by SIMATIC SIPAT and to set up and validate models.**

The runtime data can then be displayed together with historic data. The Data Miner support the fast and intuitive ad-hoc querying of data from various SIPAT databases. Data sheets, diagrams or trends can be implemented by dragging and dropping.

SIMATIC SIPAT records data during runtime, preprocesses it and, if necessary, can use models in the background to provide predictions. The results can be visualized and/or distributed with SIMATIC SIPAT. SIMATIC SIPAT can work together with different types of data mining or MVDA software packages. Chemometric functions from Umetrics are already integrated as standard in SIMATIC SIPAT.

Using self-defined evaluation rules, you can check the trustworthiness and reliability of the received data and identify outliers or invalid data. The Data Miner is then capable of filtering out invalid or suspicious data and factoring it out when creating the model.

Models are saved with version and status data in the SIMATIC SIPAT archive. It is unnecessary to combine all predictions for a specific PAT procedure in one single model. A procedure can include several models which can be arranged hierarchically or in parallel. The data required for this purpose can be used repeatedly.

A model or a calculation can also be applied, depending on whether certain conditions are met in the method. One example of this is the hierarchical models in which the application of the model is determined by the output of the preceding model.

A calculation type based on a snippet file greatly simplifies the creation of your own complex calculations.
Industry-specific applications

Process Analytical Technology

SIMATIC SIPAT: Optimization of product development and production

Function (continued)

Model types

In contrast to other PAT systems which are usually limited to the model of an analyzer or perhaps to an additional model of a single procedure, a general process model can be developed with SIMATIC SIPAT which allows prediction of the end product quality parameters.

- **Model of a single analyzer**
  Model on the basis of the recorded data of a particular analyzer, for example, through creation of a near infrared procedure (NIR), the prediction of specific parameters, principal component analysis (PCA) or a partial least squares procedure (PLS)

- **Model of a single procedure**
  Model on the basis of the recorded data of a particular single procedure (data from sensors, analyzers etc.), for example, a combination of pH value, temperature, pressure, dissolved oxygen and NIR data during operation of a single bioreactor

- **Host process/product (range) model**
  Model on the basis of the recorded data of various single procedures of the total process range - from the raw materials up to the end product. This model is a special feature of SIMATIC SIPAT.

Monitoring and open-loop control

Integration in the batch

The model of a single procedure or of the process is used as the basis for development of a model for process control (feedback and feedforward control/correction).

SIMATIC SIPAT is responsible for the quality aspects of the process, and provides the corresponding information for the SCADA/process control system. The SCADA/process control system implements the control measures required to guarantee the quality. To implement the feedforward/feedback control, the two systems are connected in real-time via an OPC interface.

The close connection to a batch system for batch process automation permits synchronization of the recipe-based procedures with SIMATIC SIPAT. SIMATIC SIPAT can then define the end conditions for a particular procedure or phase, for example.

Visualization of data

The graphic user interface (GUI) of SIMATIC SIPAT permits you to record data interactively, to create new PAT procedures, or to view additional information on current or historical production batches. All critical quality parameters can be monitored online.

The process can be monitored by comparing plotter parameters with the golden batch series. Visualization takes place either using the SCADA/process control system or the graphic user interface of SIMATIC SIPAT.

The configuration of the displays, e.g. diagrams or trends, is simple and intuitive. The development of the data during its recording in SIMATIC SIPAT is traceable. In the event of an alarm, recorded data and commented data can be highlighted. Corresponding data in different diagrams/trends can be visualized in relation to each other. The volume of data can be restricted by filtering via the data element status.

Variable limit values

SIMATIC SIPAT supports not only the definition of a static limit for the entire life of the SIPAT method, but also variable limits that vary according to the chronological sequence or a data set sequence, e.g. depending on the "Golden Batch".

The PAT-ID can also be specified as a limit value. By means of the PAT-ID, limit values of specifications held in other systems can be read in to SIMATIC SIPAT during the execution of the SIPAT method.

Feedback for SCADA/process control system

SIMATIC SIPAT can be configured so that predicted parameters critical to the quality can be returned to the SCADA/process control system. These can then be used by the SCADA/process control system for control using traditional PID controllers or Advanced Process Control (APC) technologies.

SIMATIC SIPAT can send prediction values or principal components online to the SCADA/process control system and to any OPC servers, ERP and MES systems can also be integrated as outputs. A typical application example is the transfer of information concerning one or more critical quality parameters to an MES or ERP system to approve a batch following a particular single procedure.
Function (continued)

Logging

SIMATIC SIPAT saves all data measured and calculated during the operative execution of a PAT procedure together with the available batch information in a database. This data is available for evaluation using any logging tools.

SIMATIC SIPAT supports logging by means of:

- Predefined or user-specific reports
- Logging module for creation of CSV files using universal database queries

When creating reports in an environment with several plants, the configured data domains can also be taken into consideration. The logs present in CSV format can be imported into statistics programs or Microsoft Office applications.

Audit functionality

SIMATIC SIPAT is provided with a comprehensive audit functionality which supports quality assurance of the production sequences in accordance with the guidelines for Good Manufacturing Practice (GMP) in the pharmaceutical industry and in the food and fodder industry. This guideline conforms with the corresponding statutory directives, in particular the Food and Drug Administration (FDA) guidelines anchored in 21 CFR Part 11. The most important audit function blocks include:

- System security and authorization checks
- Electronic signatures
- Recording of all changes to data sets, including information on who, what and why, and remarks
- Storage of documents and repeatability in the online database as well as in the archived data
- Version check for objects such as PAT procedures, models, device settings, etc.

Customized adjustments

The standard functionality provided with SIMATIC SIPAT for design, analysis, optimization and control of product development and production on the basis of up-to-date measurements of critical quality and performance attributes of raw materials, process materials and procedures is extremely comprehensive and versatile. It can be easily configured by trained users via the SIMATIC SIPAT graphic user interface (GUI).

The sequences which can be implemented with the SIMATIC SIPAT standard functions can be adapted and expanded by means of user-specific functions and workflows.
### Selection and ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
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<tbody>
<tr>
<td><strong>SIMATIC SIPAT V3.1 Software</strong></td>
<td>6DL5 422-8AB13-0BA0</td>
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<tr>
<td><strong>SIMATIC SIPAT Base Station</strong></td>
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<td>(4 methods)</td>
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<tr>
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<td>distributed SIMATIC SIPAT Base Station</td>
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<td>installation</td>
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<tr>
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<tr>
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<td>Requirement: available only with a SIMATIC SIPAT support contract.</td>
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<td>Type of delivery:</td>
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<td>executes with Windows XP Professional / Server 2003, single license for 1</td>
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<td>installation</td>
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<td>Requirement: 1 x SIMATIC SIPAT Basic Package (1 method)</td>
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<td><strong>SIMATIC SIPAT Light</strong></td>
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<td>For the installation of a distributed, preconfigured (non-modifiable)</td>
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<td>installation</td>
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<td>Management</td>
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<td>Electronic documentation, 1 language (English), on DVD “SIMATIC SIPAT V3.1”</td>
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<tr>
<td>• DVD “SIMATIC SIPAT V3.1”</td>
<td></td>
</tr>
<tr>
<td><strong>SIMATIC SIPAT Light</strong></td>
<td></td>
</tr>
<tr>
<td>(Preconfigured) V3.1</td>
<td>6DL5 422-1XX13-2BA0</td>
</tr>
<tr>
<td>For the installation of a distributed, preconfigured (non-modifiable)</td>
<td></td>
</tr>
<tr>
<td>SIMATIC SIPAT System V3.1 for one “unit” (according to S88).</td>
<td></td>
</tr>
<tr>
<td>Engineering and runtime software, 1 language (English), software class A,</td>
<td></td>
</tr>
<tr>
<td>executes with Windows XP Professional / Server 2003, single license for 1</td>
<td></td>
</tr>
<tr>
<td>installation</td>
<td></td>
</tr>
<tr>
<td>Including all SIMATIC SIPAT V3.1 components except SIMATIC SIPAT Report</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Electronic documentation, 1 language (English), on DVD “SIMATIC SIPAT V3.1”</td>
<td></td>
</tr>
<tr>
<td>Requirement: Available only with a SIMATIC SIPAT support contract.</td>
<td></td>
</tr>
<tr>
<td>Type of delivery:</td>
<td></td>
</tr>
<tr>
<td>• Certificate of license incl. terms and conditions, product information</td>
<td></td>
</tr>
<tr>
<td>• DVD “SIMATIC SIPAT V3.1”</td>
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<td><strong>SIMATIC SIPAT Light</strong></td>
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<td>6DL5 422-1XX13-2BA0</td>
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<td>D: Subject to export regulations AL: N and ECCN: 5D992</td>
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</tbody>
</table>
## Ordering data

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Test Environment V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| Installation of a distributed SIMATIC SIPAT Systems V3.1, to be used for testing and validation purposes only. Engineering and runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Including all SIMATIC SIPAT V3.1 components except SIMATIC SIPAT Report Management Electronic documentation, 1 language (English), on DVD “SIMATIC SIPAT V3.1” Requirement: Available only with a SIMATIC SIPAT support contract. Type of delivery:  
  - Certificate of license incl. terms and conditions, product information  
  - DVD “SIMATIC SIPAT V3.1” | 6DL5 422-1XX13-3BA0 |

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Productivity Pack Analyzer Type V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| for installation of the first analyzer of a type Runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Requirement: 1 x SIMATIC SIPAT Base Station (4 methods) Type of delivery:  
  - Certificate of license incl. terms and conditions, product information | 6DL5 422-8CX13-0BB0 |

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Productivity Pack Analyzer Type V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| for installation of an additional analyzer of the same type following installation of the first analyzer Runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Requirement: 1 x SIMATIC SIPAT Productivity Pack Analyser Type per type of analyzer Type of delivery:  
  - Certificate of license incl. terms and conditions, product information | 6DL5 422-8CX13-1BB0 |

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Report Manager Server V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| for a SIMATIC SIPAT database server Runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Requirement: 1 x SIMATIC SIPAT Base Station (4 methods) Type of delivery:  
  - Certificate of license incl. terms and conditions, product information | 6DL5 422-8DX13-0BB0 |

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Report Manager Universe Customizer V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| for a SIMATIC SIPAT database server Engineering software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Requirement: 1 x SIMATIC SIPAT Report Manager Server Type of delivery:  
  - Certificate of license incl. terms and conditions, product information | 6DL5 422-8DX13-1BB0 |

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Productivity Pack Reporting V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| for a SIMATIC SIPAT database server Runtime software, 1 language (English), software class A, executes with Windows XP Professional or Windows Server 2003, single license for 1 installation Requirement: 1 x SIMATIC IT Report Manager or Business Object license Type of delivery:  
  - Certificate of license incl. terms and conditions, product information | 6DL5 422-8CX13-2BB0 |

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Report Manager Client, 1 concurrent client V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| for installation on a named client Engineering and runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Requirement: 1 x SIMATIC SIPAT Report Manager Server Type of delivery:  
  - Certificate of license incl. terms and conditions, product information | 6DL5 422-8DA13-0BB0 |

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Report Manager Client, 10 concurrent clients V3.1</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| for installation on up to 10 clients (1 installation per client) Engineering and runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 10 installations Requirement: 1 x SIMATIC SIPAT Report Manager Server Type of delivery:  
  - Certificate of license incl. terms and conditions, product information | 6DL5 422-8DB13-0BB0 |

**D: Subject to export regulations AL: N and ECCN: 5D992**
## Ordering data

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Lab/Line License V3.1</th>
<th>Order No.</th>
<th>SIMATIC SIPAT V3.1 support contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>for 1 distributed SIMATIC SIPAT V3.1 system for a laboratory or a plant section (process cell) in accordance with ISA-88 definition Engineering and runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Including all SIMATIC SIPAT V3.1 components except SIMATIC SIPAT Report Management Electronic documentation, 1 language (English), on DVD &quot;SIMATIC SIPAT V3.1&quot; Requirement: Available only with a SIMATIC SIPAT support contract. Type of delivery:  • Certificate of license incl. terms and conditions, product information  • DVD &quot;SIMATIC SIPAT V3.1&quot;</td>
<td>6DL5 422-1XX13-0BA0</td>
<td>On request</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIMATIC SIPAT Site License V3.1</th>
<th>Order No.</th>
<th>SIMATIC SIPAT V3.1 support contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>for 1 distributed SIMATIC SIPAT V3.1 system for one factory in accordance with ISA-88 definition; incl. all SIMATIC SIPAT V3.1 components except SIMATIC SIPAT Report Management Engineering and runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation Including all SIMATIC SIPAT V3.1 components except SIMATIC SIPAT Report Management Electronic documentation, 1 language (English), on DVD &quot;SIMATIC SIPAT V3.1&quot; Requirement: Available only with a SIMATIC SIPAT support contract. Type of delivery:  • Certificate of license incl. terms and conditions, product information  • DVD &quot;SIMATIC SIPAT V3.1&quot;</td>
<td>6DL5 422-1XX13-1BA0</td>
<td>On request</td>
</tr>
</tbody>
</table>

## More information

Siemens AG  
Industry Sector  
Industry Automation Division  
Industrial Automation Systems Karlsruhe  
E-mail: info.sipat@siemens.com  
You can find more information on the Internet at:  
www.siemens.com/sipat
## Operator control and monitoring

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/2</td>
<td>OPD: Operator dialog with electronic signatures</td>
</tr>
<tr>
<td>5/3</td>
<td>Alarm Control Center: Signaling faults by means of telecommunication</td>
</tr>
<tr>
<td>5/4</td>
<td>Premium Server for SIMATIC PCS 7</td>
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<td>5/6</td>
<td>Large-screen systems for control rooms</td>
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<td>KVM extender: Operator channel extensions</td>
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<tr>
<td>5/10</td>
<td>KVM matrix switches: Flexible operator station administration</td>
</tr>
<tr>
<td>5/13</td>
<td>SIVICON: Video web server for process monitoring</td>
</tr>
<tr>
<td>5/15</td>
<td>Visor: Video technology for process monitoring</td>
</tr>
<tr>
<td>5/16</td>
<td>SIMATIC HMI Thin Client Ex</td>
</tr>
<tr>
<td>5/19</td>
<td>Mouse-Trak: Trackball</td>
</tr>
<tr>
<td>5/20</td>
<td>Device manager for SIMATIC Logon</td>
</tr>
<tr>
<td>5/21</td>
<td>Operator’s ToolSet</td>
</tr>
</tbody>
</table>
Operator control and monitoring

**OPD: Operator dialog with electronic signatures**

### Overview

**PCS 7 Add-on: fit for SIMATIC PCS 7 V7**

The software operator dialog (OPD) simplifies the interaction between operating personnel and process control system. As a powerful operator tool, it facilitates control of the process and provides complete proof of all manual operations, which is essential for a validated batch system.

The OPD software, which can be executed in a SIMATIC PCS 7/ SIMATIC Batch system environment, is based on the Microsoft SQL server software. It uses the SIMATIC logon for user verification and electronic signatures. It therefore complies with the validation requirements according to 21 CFR Part 11 and other statutory directives. As a result of the flexible design, the OPD functionality can easily be adapted to any SIMATIC PCS 7 project.

**Note:**

OPD can be used together with SIMATIC PCS 7 V6 and V7.

### Function

#### Application

**Operator interaction in an SFC phase**

An OPD can be used in an SFC phase. The simplest interaction is a request to the operator to confirm an OPD message before progressing to the next step of the phase. A second application example is a request to the operator to select one of two storage tanks. Electronic signatures may be necessary in both cases.

**Operator interaction between two SFC phases**

At the batch level, OPD can also be used for operator interaction between two separate SFC phases. For example, the operator can be requested to select between different technical equipment which require separate subsystem assignments.

**Operator interaction for event-based actions**

OPD can also be used for event-based actions. An example is the request to an operator to acknowledge an OPD message before opening a valve or closing a pump.

### Electronic signatures

The OPD software provides two different possibilities for handling electronic signatures:

- The signatures can be saved in the form of WinCC messages.
- The signatures can be saved in a Microsoft SQL server database.

Saving of electronic signatures as WinCC messages provides the advantage that they can be automatically recorded in the SIMATIC Batch standard report. They can additionally be transferred to any MES system which provides long-term archiving of SIMATIC PCS 7 process data.

### OPD messages

OPD messages are configured by means of the user-friendly OPDEdit engineering tool. Version assignment of OPD messages is carried out automatically. OPDEdit provides a complete revision log of all modifications.

Each OPD message can have the following content:

- 1 text message
- 0 to 10 process values (string or real)
- 0 to 10 operator inputs (string or real)
- 0 to 3 option groups with up to 6 option boxes
- 0 to 3 control groups with up to 6 control boxes
- 0 to 5 electronic signatures

### Further features

- Redundant database server
- Multi-client capability
- Secure identifier (SID)

### More information

PlantSolutions
Box 1200
16428 Kista
Sweden

E-mail: info@plantsolutions.se

You can find additional information in the Internet at:

www.plantsolutions.se
Overview

In modern control systems, the fast and reliable signaling of fault statuses and the alarming of responsible persons is becoming increasingly important.

The modular alarm management system "Alarm Control Center" addresses these demands by sending SIMATIC PCS 7 error messages fully automatically to a host of possible recipients (text message to cellphone, fax, voice message, e-mail etc.).

The various versions of the Alarm Control Center and the options available permit individual adaptation to user requirements, ranging from stand-alone solutions up to company-wide communications solutions.

Note:
The Alarm Control Center can operate together with SIMATIC PCS 7 V6 and V7.

Function

- Radio channels included in the basic system:
  - SMS to mobile phone
  - Fax output
  - Output on message printer
- Further communications media are supported as options:
  - Sending of SMS via GSM modem with facility for acknowledgment
  - Voice output, also with language synthesis
  - Pager
  - E-mail
  - Telephone systems such as Siemens HiPath/Hicom and Ascom via OAP
  - Many further options, also customized
- Integral shift and personnel management for time-dependent sending of messages
- Comprehensive escalation system for reliable delivery of messages even if individual receivers cannot be reached
- Operation and configuration throughout the network thanks to Web capability
- Available with redundant solutions

Selection and ordering data

<table>
<thead>
<tr>
<th>Alarm Control Center</th>
<th>Product Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Basic Edition&quot;</td>
<td>9AE4 310-3BS01</td>
</tr>
<tr>
<td>&quot;Professional Edition&quot;</td>
<td>9AE4 310-3BS02</td>
</tr>
<tr>
<td>&quot;Enterprise Edition&quot;</td>
<td>9AE4 310-3BS03</td>
</tr>
<tr>
<td>PCS 7 Agent for Alarm Control Center</td>
<td>9AE4 310-3PW02</td>
</tr>
<tr>
<td>&quot;SMS via GSM modem, dual-band&quot;</td>
<td>B 9AE4 310-3FG10</td>
</tr>
<tr>
<td>&quot;SMS via GSM modem, quad-band&quot;</td>
<td>B 9AE4 310-3FG12</td>
</tr>
<tr>
<td>&quot;Voice output&quot;</td>
<td>9AE4 310-3FV10</td>
</tr>
<tr>
<td>&quot;E-mail&quot;</td>
<td>9AE4 310-3FE10</td>
</tr>
</tbody>
</table>

B: Subject to export regulations AL: N and ECCN: 5A991X

Note:
Information on other configurations and options can be found at the Internet address specified below.

More information

Siemens AG
Industry Sector
Industry Solutions Division
Industrial Technologies
WinCC and Alarm Management Competence Center
Stuttgart
Phone: +49 711 137 3935
Fax: +49 711 137 2781
E-mail: sales.alarmcc.industry@siemens.com

You can find additional information in the Internet at:
www.siemens.de/alarmcc
Premium Server for SIMATIC PCS 7

Overview

In addition to the SIMATIC PCS 7 Industrial Workstations offered in the ST PCS 7 catalog, we offer you the innovative Premium Server for SIMATIC PCS 7 — an attractive, powerful and flexible basic server system for the upper performance range of the SIMATIC PCS 7 process control system V7.1.

The Premium Server is a professional and reliable workgroup server with two quad-core Intel Xeon processors, built as standard into a 19" rack housing of 4 height units (HU). It can be used as an OS server, but also as an archive, batch or route control server, etc. The compatibility with the SIMATIC PCS 7 process control system V7.1 has been proven by extensive tests.

A floor-standing version of the Premium Server for vertical mounting is available on request.

An image DVD for disaster recovery is supplied along with the Premium Server for SIMATIC PCS 7. The preinstalled Microsoft Windows Server 2003 R2 + SP2 operating system is tailored to the requirements of the SIMATIC PCS 7 V7.1 system software.

Note:
The Premium Server for SIMATIC PCS 7 can be used as the basic server system for SIMATIC PCS 7 V7.1 and higher.

Benefits

- High performance
- High availability through fully redundant hardware configuration
- High data security due to fast, failsafe RAID1 system
- SIMATIC PCS 7 conformity minimizes project risks and commissioning costs
- Supplied restore DVD enables the original configuration to be quickly restored in the event of a failure
- Flexible for expansions, project-specific special configuration on request

Technical specifications

General features

| Operating system | Pre-installed Microsoft Windows Server 2003 R2 MUI SP2 operating system including 5 client access licenses (CAL) |
| Server management | Server management with InventoryView, alarm and SNMP management |
| Processor | Dual-Quad Intel Xeon processor technology |
| Main memory | 4 GB RAM DDR3-1333 PC3-10600 ECC expandable up to 144 GB |
| Hard disk | 2 x hot-plug SAS hard disks as RAID1 array (version "Extended HDD capacity": 6 x hot-plug SAS hard disks as RAID5 array) |
| Network connection | 2 x RJ45-TP LAN connection onboard (10/100/1000) |
| Plant bus connection (optional) | CP 1623 communication module (6GK1 162-3AA00) Additional provision if necessary (installation free of charge). 2 units are required for redundant connection. |
| Redundant terminal bus connection (optional) | SIMATIC PCS 7 redundant terminal bus adapter package (6ES7 652-0XX01-1XF1) Additional provision if necessary (installation free of charge). |
| Slots | 5 x PCIe Gen2 x4 |
| Power supply | Redundant, hot-plug power supplies and fans including monitoring |
| Rack integration | Simple 19" rack integration; including telescopic rails |
| Drives | 1 x DVD-RW supermulti 1.6" SATA drive |
| Connections | 3 x USB 2.0 connections; 2 x serial RS232 |
| Default language | English |
| Operator control | Without keyboard or mouse; without monitor |
| Warranty conditions | 3 years, EU/Norway/Switzerland, SBD Optional extension to 5 years, EU/Norway/Switzerland, SBD |

Dimensions and weight

| Rack (H x W x D) in mm | 483 x 748 x 177 |
| Floor stand (H x W x D) in mm | 286 x 745 x 466 |
| Weight | Ca. 40 kg |

Electrical connection values

| Power supply configuration | 2 x 800 W hot plug power supply with three redundant hot plug fans |
| Max. power supply output power | 2 x 800 W |
| Rated voltage range | 100 ... 240 V |
| Rated frequency range | 50 ... 60 Hz |
| Heat dissipation | 2 x 2016.0 kJ/h (1911.3 BTU) |
### Technical specifications (continued)

<table>
<thead>
<tr>
<th>Ambient conditions</th>
<th>10 ... 35 °C / 10 ... 85% (no condensation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>-30 ... 50 °C / 5 ... 95%</td>
</tr>
</tbody>
</table>

#### Ambient conditions
- **Temperature/relative humidity**
- **Operation**
- **Transport**

#### Product safety
- **Germany**: TÜV GS
- **Europe**: CE Class A
- **Global**: GB, RoHS (Restriction of Hazardous Substances, limitation of use of hazardous substances), WEEE, disposal of waste electrical and electronic equipment

#### Compliance with directives
In general, the safety requirements all European countries and North America maintained.

#### Electromagnetic compatibility (EMC)
- **Conformity procedures (Class A)**
  - Australia, New Zealand: C-Tick
  - Japan, Taiwan: VCCI Class A
  - USA, Canada: CNS 13438 class A, CSAc/us/FCC class A

#### Selection and ordering data

<table>
<thead>
<tr>
<th>Premium Server for SIMATIC PCS 7, standard capacity 9AE4510-2PC70</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rack housing 4 HU</td>
</tr>
<tr>
<td>• 2 x Intel Xeon E5630 4C/8T</td>
</tr>
<tr>
<td>• 2.53 GHz 12 MB</td>
</tr>
<tr>
<td>• 4 GB main memory</td>
</tr>
<tr>
<td>• Hard disk system (RAID1) SAS 300 GB 10K HOT PLUG 2.5&quot;</td>
</tr>
<tr>
<td>• System partition 50 GB</td>
</tr>
<tr>
<td>• Data partition 225 GB</td>
</tr>
<tr>
<td>• 2 x 10/100/1000-TP-LAN</td>
</tr>
<tr>
<td>• Redundant power supply/fan</td>
</tr>
<tr>
<td>• Windows Server 2003 R2 MUI SP2 operating system, 5 CALs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Premium Server for SIMATIC PCS 7, extended capacity 9AE4510-2PC71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended for use as Central Archive Server (CAS)</td>
</tr>
<tr>
<td>• Rack housing 4 HU</td>
</tr>
<tr>
<td>• 2 x Intel Xeon E5630 4C/8T</td>
</tr>
<tr>
<td>• 2.53 GHz 12 MB</td>
</tr>
<tr>
<td>• 4 GB main memory</td>
</tr>
<tr>
<td>• Hard disk system (RAID5) SAS 300 GB 10K HOT PLUG 2.5&quot;</td>
</tr>
<tr>
<td>• System partition 50 GB</td>
</tr>
<tr>
<td>• Data partition 1 TB</td>
</tr>
<tr>
<td>• 1 x hot spare HDD</td>
</tr>
<tr>
<td>• 2 x 10/100/1000-TP-LAN</td>
</tr>
<tr>
<td>• Redundant power supply/fan</td>
</tr>
<tr>
<td>• Windows Server 2003 R2 MUI SP2 operating system, 5 CALs</td>
</tr>
</tbody>
</table>

### More information

Industry Sector
- Industry Solutions Division
- Industrial Technologies
- Karlsruhe

Phone: +49 721 595 2350
Fax: +49 721 595 6630

E-mail: pcs7-premiumserver.industry@siemens.com
Operator control and monitoring

Large-screen systems for control rooms

Overview

Apart from the type and scope of the presentation of information, the architecture of the control center is a major criterion influencing the decision of the control system customer. The full specification of a control center includes recommendations relating to screen, image encoder technology, installation, lighting, air conditioning and software.

As a reliable partner for the user-friendly configuration of control centers with large-screen systems, Barco Control Rooms pays particular attention to the balance between functional, ergonomic and economic aspects.

Control rooms with large-screen systems based on back-projection and LCD systems from Barco Control Rooms are ergonomic and functional. They provide an exceptional working atmosphere, and impressively represent the plant within the company and toward customers and visitors.

Note:
Large-screen systems from Barco Control Rooms can be used together with SIMATIC PCS 7 V6 and V7.

Function

The many years of experience of Barco Control Rooms in the development of back-projection and LCD systems is reflected in the comprehensive range of products based on state-of-the-art technologies.

The range includes the following standard products:

<table>
<thead>
<tr>
<th>System</th>
<th>Screen diagonal 1)</th>
<th>Technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>OverView D2 series</td>
<td>50&quot;, 70&quot;, 80&quot;</td>
<td>Single-chip DLP technology&lt;br&gt;Type x08 = XGA resolution (1024 x 768 pixels)&lt;br&gt;Type x13 = SXGA resolution (1280 x 1024 pixels)&lt;br&gt;Type x15 = SXGA+ resolution (1400 x 1050 pixels)&lt;br&gt;16.7 million colors, double-lamp system, automatic brightness and color adjustment&lt;br&gt;Redundant digital interface (DVI-D) ²) and web-based service interface&lt;br&gt;OVF: Front access, small space requirements</td>
</tr>
<tr>
<td>OverView LED series</td>
<td>50&quot;, 70&quot;</td>
<td>Single-chip DLP technology with LED,&lt;br&gt;type x21 = Full HD resolution (1920 x 1080 pixels)&lt;br&gt;type x10 = HD Ready resolution (1360 x 768 pixels), 16.7 million colors, LED illumination unit, automatic brightness and color adjustment&lt;br&gt;Redundant digital interface (DVI-D) ²) and web-based service interface&lt;br&gt;OLF: Front access, small space requirements</td>
</tr>
<tr>
<td>NSL-4601</td>
<td>46&quot;</td>
<td>LCD, near seamless&lt;br&gt;Single-chip DLP technology&lt;br&gt;Resolution: WXGA (1366 x 768 pixels)&lt;br&gt;RS 232 service interface</td>
</tr>
</tbody>
</table>

1) Customized systems with screen diagonals up to 120° can also be implemented.

²) An interface for an analog port (VGA) is available as option.
Function (continued)

All large-screen systems have a modular structure. Several screens can be combined into a panel of any size. The panel is thus a large monitor on which graphic objects and information can be displayed and moved beyond the limits of the individual screens.

The image sources offer exceptional brightness and contrast values as well as sharp and distortion-free pictures. The automatic brightness and color adjustment of all modules of a large panel by means of Sense® technology guarantees a uniform and ergonomic image quality.

All back-projection and LCD systems have standardized interfaces for the display of computer applications, video and monitor signals. They can be connected directly to the SIMATIC PCS 7 operator stations without any additional configuration (plug & play).

The back-projection and LCD systems from Barco Control Rooms are optimized for low-maintenance 24/7 operation. For example, the OL series can operate for 5 years without maintenance.

More information

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Phone: +65 62437610

Japan
Phone: +81 3 57628720

You can find additional information in the Internet at:

www.barcocontrolrooms.com
Using the Keyboard Video Mouse extenders from Guntermann & Drunck GmbH you can extend the operating channel of the SIMATIC PCS 7 Industrial Workstation. It is then possible to spatially separate the display and operation components from the computer, and position operator stations up to 10,000 m away from the computer.

The KVM extenders are able to transmit the following computer signals:

- Video (single or multiple)
- Keyboard, mouse (PS/2 and USB)
- USB 1.1 and USB 2.0 (optional)
- Audio (optional)
- RS 232 (optional)
- Remote power (optional)

You can select the following product versions depending on requirements (differences can be found under “Technical specifications”):

- DVIVision (transmission of DVI-Single-Link up to max. 140 m)
- CATVision (transmission of VGA up to max. 300 m)
- LwLVision (transmission of VGA and DVI-Single-Link up to max. 10,000 m)
- FIBREVision (transmission of DVI-Single-Link up to max. 10,000 m)
- DL-Compact (transmission of DVI-Dual-Link up to max. 400 m)

Note:
The KVM extenders DVIVision, CATVision, LwLVision, FIBREVision and DL-Compact can be used together with SIMATIC PCS 7 V6 and V7.
### Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>DVIVision</th>
<th>CATVision</th>
<th>LwLVision</th>
<th>FIBREVision</th>
<th>DL-Compact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local operator station (console)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Maximum transmission distance in m</td>
<td>140</td>
<td>300</td>
<td>550/10 000</td>
<td>550/10 000</td>
<td>400</td>
</tr>
<tr>
<td>Transmission medium</td>
<td>Cable CAT5e and higher</td>
<td>CAT5/CAT6/CAT7 cable</td>
<td>Multi-mode/ single-mode fibers</td>
<td>Multi-mode/ single-mode fibers</td>
<td>Multi-mode fibers</td>
</tr>
<tr>
<td>Signals always possible for transmission</td>
<td>Keyboard, video, mouse</td>
<td>Keyboard, video, mouse</td>
<td>Keyboard, video, mouse</td>
<td>Keyboard, video, mouse</td>
<td>Keyboard, video, mouse</td>
</tr>
<tr>
<td>Additional signals which can be transmitted (optional)</td>
<td>RS 232/audio and USB 1.1</td>
<td>RS 232, audio, USB 1.1 and USB 2.0</td>
<td>RS 232, audio (included) and USB 1.1</td>
<td>RS 232, audio and USB 1.1</td>
<td>-</td>
</tr>
<tr>
<td>Keyboard/mouse format</td>
<td>PS/2 and USB (also mixed mode)</td>
<td>PS/2 and USB (also mixed mode)</td>
<td>PS/2 and USB (also mixed mode)</td>
<td>PS/2 and USB (also mixed mode)</td>
<td>PS/2 and USB (also mixed mode)</td>
</tr>
<tr>
<td>Video</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Input</td>
<td>Digital (single link)</td>
<td>Analog</td>
<td>Analog or digital (single link)</td>
<td>Analog or digital</td>
<td>Digital (single link)</td>
</tr>
<tr>
<td>• Output</td>
<td>Analog or digital 1920 x 1200 at 60 Hz</td>
<td>Analog 1920 x 1440 at 75 Hz (depending on distance)</td>
<td>Analog or digital 1280 x 1024 at 75 Hz, 1920 x 1200 at 60 Hz</td>
<td>Analog or digital 1920 x 1200 at 60 Hz</td>
<td>Digital (dual link)</td>
</tr>
<tr>
<td>• Maximum resolution</td>
<td>Up to 4</td>
<td>Up to 4</td>
<td>Up to 2</td>
<td>Up to 4</td>
<td>1</td>
</tr>
<tr>
<td>• Number of channels</td>
<td>With KVM switch</td>
<td>With KVM switch</td>
<td>With KVM switch</td>
<td>With KVM switch</td>
<td>With KVM switch</td>
</tr>
</tbody>
</table>

Note:
Depending on the cable medium and video signal used, the systems possess automatic image optimization mechanisms.

### More information
Guntermann & Drunck GmbH
Systementwicklung
Dortmunder Str. 4a
57234 Wilnsdorf
Germany
Phone: +49 27 39-89 01-100
Fax: +49 27 39-89 01-120
E-mail: sales@gdsys.de
You can find additional information in the Internet at:
www.gdsys.de/
By using the compact KVM matrix switches, you can access n servers of a system from m different operator stations locally and/or remotely. Remote access can be carried out in different manners:

- by LAN (Local Area Network)
- by WAN (Wide Area Network) "over IP"
- 1:1 via CAT cable (distances up to 300 m)

The following products are available:

- CATCenter NEO 4/32, 8/32 or 16/64 (operator stations/servers)
- CompactCenter X2: 2/16 (operator stations/servers)

The differences between these products can be found under "Technical specifications".

Both KVM matrix switches communicate via CAT cables (types 5, 6, 7). They access the external server interfaces via the CATpro2 server modules (connection dongle).

The operator stations are connected to the CATCenter NEO via user console modules (UCON). With the CompactCenter X2, the operator station is integrated in the KVM matrix switch.

While the CompactCenter X2 can only be operated in stand-alone mode, CATCenter NEO products can be combined with each other.

Note:
The KVM matrix switches can be used together with SIMATIC PCS 7 V6 and V7.
The following features of the CATCenter NEO should be highlighted:

- Audio signals are also possible (selectable)
- Can be configured by Web interface
- Network connection integrated in all models (SNMP, Syslog, monitoring functionality, configuration)

Detailed information on the CATCenter NEO system and its components is available in the Internet at:
www.gdsys.de/CATCenter_NEO_System.309.0.html

**CompactCenter X2**

![Architecture with KVM matrix switch CompactCenter X2 (schematic representation)](image)

The KVM matrix switch CompactCenter X2 switches the VGA, keyboard and mouse signals. It can be used for effective administration and simultaneous operation of up to 16 servers from two operator stations:

- 1 x analog, directly on the CompactCenter
- 1 x by LAN/WAN over IP

The central administration of individual (distributed) plant sections is a possible application example of an operator station connected by LAN/WAN over IP.

In addition to the KVM matrix switch, the CompactCenter X2 system also comprises the unit for the server link. You will need the following:

- Central unit: KVM matrix switch CompactCenter X2 with 2 integral operator station connections
- Server unit: server connection dongle CATpro2, versions

Detailed information on the CompactCenter X2 system and its components is available in the Internet at:
www.gdsys.de/CompactCenter.308.0.html
## Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>CATCenter NEO (4, 8, 16)</th>
<th>CompactCenter X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of consoles/operator stations</td>
<td>4/8/16 (via user console modules UCON)</td>
<td>2 (1 x local, analog/1 x by LAN/WAN over IP)</td>
</tr>
<tr>
<td>Number of servers</td>
<td>32/32/64</td>
<td>16</td>
</tr>
<tr>
<td>Video</td>
<td>- Standard VGA interface</td>
<td>Standard VGA interface</td>
</tr>
<tr>
<td>Port</td>
<td>- 1920 x 1440 at 60 Hz</td>
<td>1920 x 1440 at 60 Hz</td>
</tr>
<tr>
<td>Max. resolution</td>
<td>- 1920 x 1200 at 60 Hz in accordance with VESA CVT-RB</td>
<td>1600 x 1200 at 60 Hz in accordance with VESA DMT</td>
</tr>
<tr>
<td>- Analog</td>
<td></td>
<td>1920 x 1200 at 60 Hz in accordance with VESA CVT-RB</td>
</tr>
<tr>
<td>- Digital (over IP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandwidth</td>
<td>Up to 250 MHz</td>
<td>Up to 250 MHz</td>
</tr>
<tr>
<td>H/V sync</td>
<td>50 ... 180 kHz/30 ... 130 Hz</td>
<td>50 ... 180 kHz/30 ... 130 Hz</td>
</tr>
<tr>
<td>Color depth</td>
<td>32 bit analog, 8 bit digital</td>
<td>32 bit analog, 8 bit digital</td>
</tr>
<tr>
<td>Image optimization</td>
<td>Automatic video setting, individually adjustable</td>
<td>Automatic video setting, individually adjustable</td>
</tr>
<tr>
<td>Keyboard/mouse</td>
<td>PS/2, USB, SUN-USB, VT100</td>
<td>PS/2, USB, SUN-USB, VT100</td>
</tr>
<tr>
<td>Interfaces to computer (CATpro2)</td>
<td>PS/2, USB</td>
<td>PS/2, USB</td>
</tr>
<tr>
<td>Interfaces to operator station (UCON)</td>
<td>PS/2, USB</td>
<td>PS/2, USB</td>
</tr>
<tr>
<td>Audio</td>
<td>22 kHz</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## More information

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Systementwicklung
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Germany

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www.gdsys.de
Digital video monitoring is becoming increasingly important in many areas of industry. There is a growing need to check processes and production shops visually. Use of the tried and tested Internet technology in connection with integrated hardware and software permits implementation of particularly user-friendly and low-maintenance systems for the visual monitoring of objects.

Depending on the occurrence of certain events, appropriately qualified operating and service personnel can be brought into action very quickly. The appropriate use of the SIVICON video web server, e.g. for plant monitoring, remote diagnostics or remote maintenance, can contribute toward cutting production downtimes and guaranteeing a high product quality.

Note:
SIVICON can be used together with SIMATIC PCS 7 V6 and V7.

**Application**
- Visual checking in the process control system
- Monitoring of unmanned production shops and stores
- Plant monitoring: regional, national and global
- Monitoring in working areas with critical conditions for humans
- Work safety/security
- Construction site monitoring
- Visual checking in the object safeguarding

**Function**

The embedded video web server “SIVICON” is an independent unit which transmits compressed video signals from analog or web cameras via the LAN to the SIMATIC PCS 7 system.

The range includes versions with 4, 6, 8 and 16 camera connections. Depending on the version, the servers are equipped with up to six signal lines and four alarm outputs. In case of an event or a fault, it enables messages to be generated and forwarded independently. The operator, service engineer or alarm control center is alerted by means of e-mail or SMS (short message service) as required: either directly or via the Internet.

Several partial images can be monitored by means of the integral motion detection function, and trigger events when changes occur, e.g. generate a SIMATIC PCS 7 message.

One product version with integral digital recording offers the opportunity for recording the pictures locally on the video Web server over a longer period and to evaluate them later in the SIMATIC PCS 7 system. In this way it is possible to view and evaluate not only the event itself, but also the important period leading up to it.

SIVICON is maintenance-free, easy to install and can be controlled by means of SIMATIC PCS 7 or any Internet browser. A convenient HTML interface is available for configuration purposes.

The SIVICON video web server is integrated into the HMI of the SIMATIC PCS 7 operator system by means of SIVICON ActiveX Controls.

**SIVICON ActiveX Controls**

The following summary shows the available SIVICON ActiveX Controls and their functions:

**SIVICON View Control**

ActiveX Control for display of live video images provided by the SIVICON video web server in SIMATIC PCS 7 process displays (integration carried out by Graphics Designer)

Functions:
- Display of live images in various sizes
- Operation of controllable cameras

**SIVICON Player Control**

ActiveX Control for display of historic video images provided by the SIVICON video web server in SIMATIC PCS 7 process displays (integration carried out by Graphics Designer)

Functions:
- Display of historic images in various sizes
- Slow-motion and accelerated display

**SIVICON Notice**

ActiveX Control for transmission of all events (alarms) recorded by the SIVICON video web server and which comply with the following criteria to the message system of the SIMATIC PCS 7 operator system:
- Motion signal
- Video signal failure
- Signal input
## Selection and ordering data

<table>
<thead>
<tr>
<th>SIVICON basic system</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SIVICON V400+19” series</strong></td>
<td></td>
</tr>
<tr>
<td>• V400+19” without hard disk, with LAN</td>
<td>9AC9 311-4AA20</td>
</tr>
<tr>
<td>• V410+19” with 500 GB hard disk and LAN</td>
<td>9AC9 311-4AA30</td>
</tr>
<tr>
<td>• V410+19” with 1 TB hard disk and LAN</td>
<td>9AC9 311-4AA31</td>
</tr>
<tr>
<td><strong>SIVICON V600+19” series</strong></td>
<td></td>
</tr>
<tr>
<td>• V600+19” without hard disk, with LAN</td>
<td>9AC9 311-6AA20</td>
</tr>
<tr>
<td>• V610+19” with 500 GB hard disk and LAN</td>
<td>9AC9 311-6AA30</td>
</tr>
<tr>
<td>• V610+19” with 1 TB hard disk and LAN</td>
<td>9AC9 311-6AA31</td>
</tr>
<tr>
<td><strong>SIVICON V800 series</strong></td>
<td></td>
</tr>
<tr>
<td>• V800 without hard disk, with LAN</td>
<td>9AC9 311-4AA81</td>
</tr>
<tr>
<td>• V800 with 500 GB hard disk and LAN</td>
<td>9AC9 311-4AA80</td>
</tr>
<tr>
<td>• V800 with 1 TB hard disk and LAN</td>
<td>9AC9 311-4AA83</td>
</tr>
<tr>
<td><strong>SIVICON V1200 series</strong></td>
<td></td>
</tr>
<tr>
<td>• V1200 without hard disk, with LAN</td>
<td>9AC9 311-4AA71</td>
</tr>
<tr>
<td>• V1200 with 500 GB hard disk and LAN</td>
<td>9AC9 311-4AA70</td>
</tr>
<tr>
<td>• V1200 with 1 TB hard disk and LAN</td>
<td>9AC9 311-4AA73</td>
</tr>
<tr>
<td><strong>SIVICON V1600 series</strong></td>
<td></td>
</tr>
<tr>
<td>• V1600 without hard disk, with LAN</td>
<td>9AC9 311-4AA61</td>
</tr>
<tr>
<td>• V1600 with 500 GB hard disk and LAN</td>
<td>9AC9 311-4AA60</td>
</tr>
<tr>
<td>• V1600 with 1 TB hard disk and LAN</td>
<td>9AC9 311-4AA63</td>
</tr>
<tr>
<td><strong>SIVICON V4000 series</strong></td>
<td></td>
</tr>
<tr>
<td>• V4000 without hard disk, with LAN</td>
<td>9AC9 311-4AA41</td>
</tr>
<tr>
<td>• V4000 with 500 GB hard disk and LAN</td>
<td>9AC9 311-4AA40</td>
</tr>
<tr>
<td>• V4000 with 1 TB hard disk and LAN</td>
<td>9AC9 311-4AA43</td>
</tr>
<tr>
<td><strong>SIVICON V4000 hybrid series</strong></td>
<td></td>
</tr>
<tr>
<td>• V4000 hybrid (4 analog/4 digital) without hard disk</td>
<td>9AC9 311-4AA51</td>
</tr>
<tr>
<td>• V4000 hybrid (4 analog/4 digital) with 500 GB hard disk</td>
<td>9AC9 311-4AA50</td>
</tr>
<tr>
<td>• V4000 hybrid (4 analog/4 digital) with 1 TB hard disk</td>
<td>9AC9 311-4AA53</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Updates</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIVICON video web server update from V4xx to V6xx</td>
<td>9AC9 311-4AA00-6AA0</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Software</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIVICON View Control for incorporation of live video images into SIMATIC PCS 7</td>
<td>9AC9 311-0AA00</td>
</tr>
<tr>
<td>SIVICON Player Control for incorporation of historic video images into SIMATIC PCS 7</td>
<td>9AC9 311-0AA10</td>
</tr>
<tr>
<td>SIVICON Notice for transmission of SIVICON events (alarms) to the SIMATIC PCS 7 message system</td>
<td>9AC9 311-0AA20</td>
</tr>
</tbody>
</table>

## Service

- Training for SIVICON basic system: On request
- Support/consulting: On request

## Documentation

- Electronic documentation on SIVICON CD; also available as paper documentation: On request

## More Information

Siemens AG
Industry Sector
Industry Solutions Division
Industrial Technologies
Phone: +49 9131 7-46111
Fax: +49 9131 7-44757
E-mail: it4.industry@siemens.com
You can find additional information in the Internet at:
www.siemens.com/sivicon
Overview

Video technology can make a highly versatile contribution toward rationalization of production processes. Remote from the process, you are able to view important process sequences, evaluate the actual product state, direct the flow of goods, check areas which are difficult or even impossible to access, and much more.

The use of video technology in process automation permits, for example:
- Prevention of production faults and waste
- Optimization of energy costs for combustion processes
- Saving of personnel costs

The live video data from web cameras or analog cameras can be integrated extremely simply into the SIMATIC PCS 7 operator system using the VISOR products from ASE AG. The VISOR video server is configured using its IP address, either with ASE software or an Internet browser. Otherwise, no additional settings are necessary.

Note:
VISOR video technology can be used together with SIMATIC PCS 7 V6 and V7.

Function

Real-time for all channels

The VISOR 9000 works in real-time, i.e. it is able to record up to 25 images per second for each video channel. Image recording can be carried out time-based, event-controlled or also permanently.

Visor: Video technology for process monitoring

Special features:
- Digital saving and transmission of video and audio signals together with multi-standard compression and state-of-the-art image analysis algorithms
- Video management functionality based on user-programmable, internal logic control
- Redundant power supply expansion and internal S-ATA-RAID expansion possible

Event control

The live video images are displayed on the SIMATIC PCS 7 operator station as a continuous image and/or dependent on a request or controlled by a particular event.

Web cameras

Web cameras which can be integrated in a network are available as color or black-and-white devices with integral PTZ (pan/tilt/zoom) function.

VisorX:
The VisorX software can be used to directly integrate video signals from web cameras into the SIMATIC PCS 7 process control system. Integration is possible through Windows ActiveX or Windows Dot.Net Assembly.

Analog cameras

The image information recorded by up to 32 analog cameras is digitized in the VISOR video server, saved in compressed form, and transferred to the SIMATIC PCS 7 process control system via an Ethernet interface.

Infrared cameras

Infrared cameras for recording of thermal images are particularly suitable for monitoring, evaluating and optimizing combustion processes, for determining temperature distributions, or for fire protection.

Camera control

Cameras with PTZ (Pan/Tilt/Zoom) function or dome cameras can be controlled from any authorized workstation in the network using a mouse and keyboard.

Cascade option

As many as 32 cameras can be connected to each VISOR video server. The number of cameras used can be extended as desired by cascading video servers.

History memory

The history memory enables precise analysis of a particular event by analyzing it in the long-term archive.

Extreme ambient conditions

When combined with a wide range of enclosures, cameras can be used in hazardous areas (certified according to ATEX), in offshore applications, or in furnaces.

More information

ASE AG
Lußhardtstrasse 6
76646 Bruchsal
Germany
Phone: +49 7251 93259-0
Fax: +49 7251 93259-99
E-mail: vertrieb@ase-ag.eu
You can find additional information in the Internet at:
www.ase-ag.eu
SIMATIC HMI Thin Client Ex

Overview

SIMATIC HMI Thin Client Ex with international approvals for operation and monitoring in hazardous areas.

Application

The SIMATIC HMI Thin Client Ex is designed for use as an operator station for terminal and client applications in hazardous areas, and in particular for applications for which the performance of the SIMATIC HMI Panel PC Ex is insufficient, or when the server is located in a protected area of the plant. The widely-used RDP and Real VNC protocols are supported.

Together with the digital KVM Box, the device functions as a flexible monitor with touch functionality for PCs e.g. in control rooms.

Integration

Integrated interfaces with SIMATIC HMI Thin Client Ex:
- 10/100 Mbit 100 base TX (Ex e) or 100 base FX (Ex op is) network
- 1 x RS232 or 1 x RS422/485
- 4 x USB 2.0 (2 x Ex i, 2 x Ex e (Zone 1) or 2 x Ex nA (version Zone 2))

Technical specifications

<table>
<thead>
<tr>
<th>General features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
</tr>
<tr>
<td>Front</td>
</tr>
<tr>
<td>Operation</td>
</tr>
<tr>
<td>MTBF backlights</td>
</tr>
<tr>
<td>Operating system</td>
</tr>
</tbody>
</table>

| Mass storage     | Integrated |
| Power supply     | 24 V DC, max. 2.1 A (19”) |

<table>
<thead>
<tr>
<th>Interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
</tr>
<tr>
<td>USB 2.0</td>
</tr>
<tr>
<td>Serial</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of protection</td>
</tr>
<tr>
<td>Ambient temperature during operation</td>
</tr>
<tr>
<td>Relative humidity during operation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approvals/directives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devices in version &quot;Zone 1&quot;</td>
</tr>
<tr>
<td>II 2 (2) G Ex d e mb ib [ib] [op is] IIC T4</td>
</tr>
<tr>
<td>II 2 D Ex dT A21 IP65 T90 °C</td>
</tr>
<tr>
<td>DNV (marine engineering), GOST-R</td>
</tr>
<tr>
<td>Devices in version &quot;Zone 2&quot;</td>
</tr>
<tr>
<td>II 3 (3) G Ex d e mb nA nL [nL] [op is] IIC T4</td>
</tr>
<tr>
<td>II 3 (2) G Ex d e mb nA nL [ib] [op is] IIC T4</td>
</tr>
<tr>
<td>II 3 (2) D Ex dT A22 IP65 [ibD] T90°C, GOST-R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDP, RealVNC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital KVM switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input: DVI / VGA, PS/2 / USB, output: RJ45 (IP network)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting dimensions (W x H x D) in mm</td>
</tr>
<tr>
<td>15”: 427.5 x 327.5 x 165</td>
</tr>
<tr>
<td>19”: 522.5 x 412.5 x 165</td>
</tr>
<tr>
<td>Front dimensions in mm</td>
</tr>
<tr>
<td>15”: 440 x 340</td>
</tr>
<tr>
<td>19”: 535 x 425</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>15”: 15 kg, 19”: 23 kg</td>
</tr>
</tbody>
</table>
### Selection and ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configurator for SIMATIC HMI Thin Client Ex</strong></td>
<td>6AV7 200-0..00-.A0</td>
</tr>
<tr>
<td><strong>Design / display size</strong></td>
<td></td>
</tr>
<tr>
<td>• Zone 2: 15” Touch with function keys</td>
<td>6AV7 200-0A</td>
</tr>
<tr>
<td>• Zone 2: 19” Touch with function keys</td>
<td>6AV7 200-0B</td>
</tr>
<tr>
<td>• Zone 1: 15” Touch with function keys</td>
<td>6AV7 200-0D</td>
</tr>
<tr>
<td>• Zone 1: 19” Touch, high-brightness with function keys</td>
<td>6AV7 200-0E</td>
</tr>
<tr>
<td>• Zone 2: 15” Touch with function keys</td>
<td>6AV7 200-0F</td>
</tr>
<tr>
<td><strong>Communication interfaces</strong></td>
<td></td>
</tr>
<tr>
<td>• 10/100 base Tx, Ex e</td>
<td>6AV7 200-0.A</td>
</tr>
<tr>
<td>• 100 base Fx FOC (SC), Ex op is</td>
<td>6AV7 200-0.B</td>
</tr>
<tr>
<td><strong>Enclosure options (device is delivered already fitted)</strong></td>
<td></td>
</tr>
<tr>
<td>• without</td>
<td>6AV7 200-0..00-0</td>
</tr>
<tr>
<td>• Stainless steel enclosure for:</td>
<td></td>
</tr>
<tr>
<td>- Wall mounting</td>
<td>6AV7 200-0..00-2</td>
</tr>
<tr>
<td>- Stand (incl. coupling, 300° rotation possible)</td>
<td>6AV7 200-0..00-3</td>
</tr>
<tr>
<td>- Suspension bracket (incl. coupling, 300° rotation possible)</td>
<td>6AV7 200-0..00-4</td>
</tr>
<tr>
<td>- Support arm (incl. coupling, 300° rotation possible)</td>
<td>6AV7 200-0..00-5</td>
</tr>
<tr>
<td><strong>External keyboard for enclosure (incl. keyboard enclosure)</strong></td>
<td></td>
</tr>
<tr>
<td>• without</td>
<td>6AV7 200-0..00-A</td>
</tr>
<tr>
<td>• QWERTZ keyboard</td>
<td>6AV7 200-0..00-B</td>
</tr>
<tr>
<td>• QWERTY keyboard</td>
<td>6AV7 200-0..00-C</td>
</tr>
<tr>
<td>• AZERTY keyboard</td>
<td>6AV7 200-0..00-D</td>
</tr>
<tr>
<td>• QWERTZ keyboard with trackball</td>
<td>6AV7 200-0..00-E</td>
</tr>
<tr>
<td>• QWERTY keyboard with trackball</td>
<td>6AV7 200-0..00-F</td>
</tr>
<tr>
<td>• AZERTY keyboard with trackball</td>
<td>6AV7 200-0..00-G</td>
</tr>
<tr>
<td><strong>Further options together with stainless steel enclosure</strong></td>
<td></td>
</tr>
<tr>
<td>• Breather glands</td>
<td>~ A01</td>
</tr>
<tr>
<td>• Heating (requires breather glands)</td>
<td>~ B01</td>
</tr>
<tr>
<td>• Handles</td>
<td>~ C01</td>
</tr>
<tr>
<td>• Front USB (at bottom)</td>
<td>~ D01</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Digital KVM for HMI Thin Client Ex</strong></td>
<td>6AV7 675-0EX00-0AA0</td>
</tr>
<tr>
<td><strong>USB drive</strong></td>
<td></td>
</tr>
<tr>
<td>• Intrinsically-safe, 16 GB</td>
<td>6AV7 675-0FX00-0AA0</td>
</tr>
<tr>
<td>• Intrinsically-safe, 16 GB with recovery function</td>
<td>6AV7 675-0FX10-0AA0</td>
</tr>
<tr>
<td>• Not intrinsically-safe, 16 GB with recovery function</td>
<td>6AV7 675-0FX20-0AA0</td>
</tr>
<tr>
<td><strong>Ethernet switch</strong></td>
<td>6AV7 675-0PX00-0AA0</td>
</tr>
</tbody>
</table>

With FOC 4 x 100 Base Tx, 1 x 100 Base (MTRJ) Fx Ex op is
SIMATIC HMI Thin Client Ex

### Dimensional drawings

Legend:
- h = Mounting clamp (10 x)
- i = Clamping frame
- j = Control cabinet or enclosure

SIMATIC HMI Thin Client Ex 15"

SIMATIC HMI Thin Client Ex 19"

### More information

Additional information is available on the Internet at:
[www.siemens.com/simatic-hmi-ex](http://www.siemens.com/simatic-hmi-ex)
Mouse-Trak: Trackball

Overview

As an alternative to the standard mouse, the "Mouse-Trak" trackball mouse is offered for operating SIMATIC PCS 7 operator stations. The Mouse-Trak is available in three versions for different applications. The devices are equipped either with a PS/2 or USB interface.

Note:
Mouse-Trak Professional and Mouse-Trak Industrial are compatible with SIMATIC PCS 7 V6 and V7.

Design

- Mouse-Trak Professional for problem-free continuous use in office environments
  - BSXMP-XROHS (PS/2)
  - BSXUSB-XROHS (USB)
- Mouse-Trak Industrial for harsh environmental requirements
  (see figure)
  - BMPIND-XROHS (PS/2)
  - BUSBID-XROHS (USB)

More information

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www.chameleon-group.com
Operators control and monitoring

Overview

SIMATIC Logon is a central operator management system integrated into the SIMATIC PCS 7 process control system, which checks the authorization for access to the system components in connection with various logon devices.

SIMATIC Logon supports as standard the following devices for identifying the operating personnel:
- Keyboard
- Chip card readers USB/serial according to Catalog ST PCS 7, Chapter "Industrial Workstation/PC", Section "Expansion components"
- Logon devices which can be operated with a Microsoft device driver for the respective operating system (e.g. on a USB port).

The Device Manager for SIMATIC Logon enables various other logon devices that support different identification technologies (biometric features, chip card, electronic key etc.) to be connected to SIMATIC Logon inexpensively.

Note:
The device manager for SIMATIC can be used in combination with SIMATIC PCS 7 V6 and V7.

Benefits
- No problems with passwords, e.g. forgetting password or password easily accessible
- Fast logon without any typing errors
- Greater security thanks to personal chip card or biometric features
- Existing chip cards can be used, e.g. company identity card
- Readers of the same type can be used
- Customer-specific adaptations possible (on request)

Design

The device manager for SIMATIC Logon currently supports the connection of the following logon devices:
- Siemens Fingerprint Mouse
  - Logon by fingerprint
  - Connection via USB port
- GECMA Card Reader / Fingerprint Sensor
  - Specification: II2 G/Ex iib IIC T4 (Ex-Zone)
  - Hardware connection via RS 232 interface
- Interflex card reader
  - Compatible with chip cards from Profix, Mifare and LEGIC
  - Hardware connection via RS 232 or USB port
- Euchner electronic key system
  - Compatible with chip cards from Profix, Mifare and LEGIC
  - Hardware connection via RS 232 or USB or Ethernet interface

A free interface of the specified type on the client or on the SIMATIC PCS 7 single station is required for the hardware connection of the respective logon device.

Selection and ordering data

<table>
<thead>
<tr>
<th>Device manager for SIMATIC Logon</th>
<th>J 9AE4 100-4LD10</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiemenS Fingerprint Mouse</td>
<td></td>
</tr>
<tr>
<td>- Interflex card reader</td>
<td></td>
</tr>
<tr>
<td>- Compatible with chip cards from Profix, Mifare and LEGIC</td>
<td></td>
</tr>
<tr>
<td>- Hardware connection via RS 232 or USB port</td>
<td></td>
</tr>
<tr>
<td>- Euchner electronic key system</td>
<td></td>
</tr>
<tr>
<td>- Compatible with chip cards from Profix, Mifare and LEGIC</td>
<td></td>
</tr>
<tr>
<td>- Hardware connection via RS 232 or USB or Ethernet interface</td>
<td></td>
</tr>
<tr>
<td>Engineering software, software class A, 2 languages (German, English), single license for one installation</td>
<td></td>
</tr>
<tr>
<td>Type of delivery: Certificate of license; software and electronic documentation by online download; CD on request</td>
<td></td>
</tr>
<tr>
<td>Note: Device manager for SIMATIC logon required additionally:</td>
<td></td>
</tr>
<tr>
<td>J: Subject to export regulations AL: N and ECCN: EAR99S</td>
<td></td>
</tr>
</tbody>
</table>

Siemens AG
Industry Sector
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E-mail: it-tools.info.industry@siemens.com
Overview

Products such as OTS shift log and OTS document management system which are present in the Operator’s ToolSet (OTS) family can be used individually or combined together.

By means of fast and targeted provision of user-specific information, they permit efficient response without the need for programming knowledge or special know-how. Hence it may be possible to avoid plant failures or reduce downtimes.

Development of the OTS products was based on many years’ practical experience gained from numerous customer projects in various industries, and considers the demands and requirements of many owners of SIMATIC PCS 7 systems.

Note:
OTS suite, OTS shift log and OTS document management system can be used together with SIMATIC PCS 7 V6 and V7.

Function

OTS Info Object

The Info Object is the interface between the plant objects and various OTS programs. A mouse click on the Info Object opens a menu with the following options:

1. Open object view of shift log
2. Collect archive value (process tag) using the curve collector
3. Add archive value (process tag) to the curve group system
4. Open linked documents

OTS curve collector and OTS curve group system – a contribution to plant safety

The curve collector is comparable with a shopping basket which can be conveniently filled with up to 10 process tags from different parts of the plant by means of a mouse click in the process image.

The values of these process tags can be subsequently displayed in the curve group system. The settings of the process tag, e.g. name or unit of measure, are imported at the same time, and automatically taken into account in the curve display. The curve group system is used for simple display and management of curve groups.

The simultaneous display of curves of various measured values, the fast opening of existing curve groups, and the situation-dependent creation of new curve groups enable operators to recognize any abnormalities or imminent failures earlier and to react accordingly.

OTS shift log – advantage through information

The clear OTS shift log allows colleagues to be informed simply and rapidly of all events in the system, and also to delegate and track tasks. Plant operators, shift engineers and plant managers can rapidly gain an up-to-date overview of the status of the complete plant on the SIMATIC PCS 7 OS client or on the computer in the office.

Recording of the information and instructions directly on the object in the process image, as well as their management, is carried out uniformly throughout the company and independent of the shift. Stored information can be called simply by clicking on the Info Object. The information is therefore always available at the position where it is required – structured in different views, with status ID, in document quality, and for an unlimited time.

The OTS shift log is suitable for optimization and simplification of processes, and also takes into account the official requirements. Improved communication, fewer misunderstandings, and reduced paper requirements are additional advantages.
Function (continued)

**OTS Document Management System – documentation at the right location**

The OTS document management system (OTS-DMS) is distinguished by its plant-oriented storage of documents. The documents can be called intuitively, i.e. simply by clicking directly on the process object. OTS-DMS finishes with mountains of paper and time-consuming document searches. It allows convenient organization of electronic documents of any type, and makes them easy to find again.

The advantages of the central data storage also take effect. All operators access a uniform database. Problems resulting from different versions or time-consuming updating of documents at different storage locations belong to the past.

The OTS-DMS can also be executed on computers which do not contain SIMATIC PCS 7 OS software.
| 6/2 | MFL: Modular PCS 7 function block library for technological functions |
| 6/3 | PTE400: PCS 7 function block library for technological functions |
| 6/5 | HVAC library for SIMATIC PCS 7 |
| 6/7 | PST for SIMATIC PCS 7: Partial stroke test |
| 6/10 | AS-Interface block library for SIMATIC PCS 7 |
| 6/12 | Gas analysis library for SIMATIC PCS 7 |
| 6/13 | PumpMon for SIMATIC PCS 7: Condition monitoring for centrifugal pumps |
| 6/15 | IEC 61850 libraries for protective equipment integration in SIMATIC PCS 7 |
| 6/17 | Modbus TCP libraries for SIMATIC PCS 7 |
Overview

The modular block library "MFL" enables the maximum performance to be obtained from SIMATIC PCS 7 and allows flexible response to specific technological demands.

The blocks offered for technological functions such as motor, valve, controller etc. are implemented with small, fast basic blocks. These are delivered together with the CFC sources and can therefore be adapted flexibly if there are special requirements. All blocks of a process tag can be visualized and operated by means of a variable faceplate. Operator panels can also be integrated into the SIMATIC PCS 7 system configuration by means of the MFL for on-site operation.

Note:

The modular block library MFL can be used together with SIMATIC PCS 7 V6 and V7.

Application

The PCS 7 library "MFL" includes, for example, function blocks for:

- Motor, 1 direction of rotation
- Motor, 2 directions of rotation
- Motor, 2 speeds
- Motor FU
- Valves
- Motor slide
- Controller
- Dosing
- Interlocking module
- Analog value monitoring

Function

Modular blocks

In contrast to other libraries, blocks for the implementation of technological functions such as motor, valve, controller etc. are created in MFL from small, fast basic blocks that are graphically interconnected in the CFC and subsequently translated as a block type.

Because the graphical sources are also supplied, the user can, if required, very easily adapt the blocks to specific industries or plants without having to develop new basic functions, such as fault philosophy, special control logic or colors.

Adaptable faceplates

For special applications, blocks can be used several times or different blocks can be combined with one another (4-way valves, motors with special on-site switches etc.) and the faceplates can be correspondingly adapted. The number and functions of the required keys, symbols, and status displays can be programmed in interactive mode.

Process tag-oriented faceplates

The MFL is different from libraries in which each block has its own faceplate. In this case a faceplate is not linked rigidly to a structure variable but is adapted dynamically to the called CFC typical. All operable blocks belonging to a process tag can thus be visualized and operated by means of a shared faceplate (see graphic with one motor block, two interlock blocks, current indicator and operating hours counter).

Multiple views

Blocks may occur several times within one process tag, for example, several locking function blocks for one motor. The faceplate then adapts itself automatically to the conditions, and enables the operator to choose the required block by means of a popup menu (release, automatic etc.). Similarly, the view of a block is not displayed if it is not a component of the process tag.

More information

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You can find additional information in the Internet at:

www.actemium.de
Overview

One outstanding feature of modern process control systems is that they use standardized, modular software functions for the automation and visualization of process engineering processes.

With the PTE400 function block library of SIMATIC PCS 7, you receive a collection of tried and tested technological function blocks for rational and cost-effective generation of SIMATIC PCS 7 user software for process automation and visualization. These blocks have a high degree of standardization, cover a wide range of functions, and satisfy the requirements of many different industries, such as:

- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Oil and gas
- Water and wastewater
- Cement

Block variants with different levels of functionality and faceplates allowing central modification permit flexible adaptation to project-specific requirements and special customer needs.

You can benefit from the great potential for rationalization and the numerous advantages offered by standardization in terms of validation and in the phases of bidding, engineering, commissioning, qualification and operation, while retaining all the necessary flexibility.

Note:
The PTE400 function block library can be used with SIMATIC PCS 7 V6.1, V7.0 and V7.1, and is also kept updated for these SIMATIC PCS 7 versions. The Siemens Industrial Technologies Group in Karlsruhe offers project-specific upgrading to the SIMATIC PCS 7 Advanced Process Library (APL) for existing plants with the PTE400 block library. Additional information and quotations can be obtained on request from the contact address under "More info".

Function

The PTE400 library offers blocks for the following functions:

- Analog value monitoring
- PID control
- Analog actuators
- Motor block with 1 control
- Motor with 2 directions of rotation
- Motor with 2 speeds
- Motor for speed-controlled drives
- Motor slide
- Control module for open/close valves
- Control module for multiway valves
- Proportioning block with coarse/fine flow
- Interlocking module
- Binary value monitoring
- Step controller function
- Fast shutdown for drives
- Motor slide with analog position feedback
- Binary value operation 1-from-8 and 1-from-32
- Setpoint input
- Central setpoint and parameter input
- Pre-warning for open drives
- Time switch function
- Ratio formation
- Quantity value recording
- Count value recording
- Switching cycle and operating hours counter
- Time trigger function
- "Interface Connection" function
### Selection and ordering data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PTE400 block library for SIMATIC PCS 7 V7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>J 9AE4 210-1AA00</td>
<td>PTE400 V7.1 Block library with process technology elements for SIMATIC PCS 7 V7.1 With function blocks and faceplates, electronic documentation, and engineering and runtime license for one AS 414, AS 416 or AS 417 automation system. Engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation. Type of delivery: Software and electronic documentation on CD, engineering and runtime license.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PTE400 block library for SIMATIC PCS 7 V6.1/7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>J 9AE4 210-2AB00</td>
<td>PTE400 V6.1 Block library with process technology elements for SIMATIC PCS 7 V6.1/7.0 With function blocks and faceplates, electronic documentation, as well as: • Engineering license for one project • Runtime license for an AS 414, AS 416 or AS 417 automation system. Engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation. Type of delivery: Software and electronic documentation on CD, engineering and runtime license.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PTE400 block library - Project upgrade to V7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>J 9AE4 210-2GB00</td>
<td>PTE400 V6.1 – AS runtime license For one AS 414, AS 416 or AS 417 automation system (ID no. of associated block library required) Runtime software, software class A, 2 languages (German, English), single license for 1 installation. Type of delivery: Runtime license.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PTE400 block library - Project upgrade to V6.1/7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>J 9AE4 210-2GB04-0BD0</td>
<td>PTE400 V6.1 – AS runtime license For one AS 414, AS 416 or AS 417 automation system (ID no. of associated block library required) Runtime software, software class A, 2 languages (German, English), single license for 1 installation. Type of delivery: Runtime license.</td>
</tr>
</tbody>
</table>

### More information

Siemens AG  
Industry Sector  
Industry Solutions Division  
Industrial Technologies  
Karlsruhe  
Phone: +49 721 595-6380  
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You can find additional information in the Internet at:  
www.siemens.de/PTE400
Overview

The HVAC Library for SIMATIC PCS 7 is a collection of specific function blocks for building automation in industrial environments. Applications implemented with these blocks allow the SIMATIC PCS 7 process control system to handle control tasks for heating, ventilation and air conditioning (HVAC) in addition to the original tasks for process automation. A common system platform for process and building automation with a uniform visualization and engineering environment provides many advantages for operation, servicing and stocking of spare parts, resulting in significant cost savings.

Note:
The HVAC Library can be used together with SIMATIC PCS 7 V7. It supports the technology integrated in the process control system since SIMATIC PCS 7 V6 for operator control and monitoring via the web.

Application

The HVAC Library is particularly suitable for creating SIMATIC PCS 7 applications for open-loop and closed-loop control of heating, ventilation and air conditioning in industrial buildings/rooms, in particular for clean rooms in the pharmaceutical, semiconductor and food & beverages industries.

Function

The HVAC Library contains a large number of special function blocks and engineering templates to allow low-overhead creation of HVAC applications. An application can be conveniently tested in the office by using function blocks for plant simulation.

The available objects are categorized as follows:

- General objects
  - Basic function blocks
  - Arithmetic function blocks
  - Time switch programs
- Air conditioning technology
  - Signaling blocks
  - Control units
  - Switching instructions
  - Positioning instructions
- Heating technology
  - Heat generators
  - Heat consumers
- Process simulation
  - Function blocks for simulation

Since the objects are provided in the form of modifiable CFCs, planning departments or engineering consultants can carry out application-specific modifications simply and cost-effectively.

Complete application examples are provided together with the HVAC Library (e.g. air-conditioning system), and can be used for acquaintance purposes and to facilitate engineering.
### HVAC library for SIMATIC PCS 7

#### Selection and ordering data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>HVAC library for SIMATIC PCS 7 V7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6BQ2 001-0AA20-0AC0</td>
<td>HVAC Library Toolset V3.1 Engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation Type of delivery: Software and electronic documentation on CD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>HVAC library for SIMATIC PCS 7 V6.0, V6.1 and V7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>6BQ2 001-0AA10-0AC0</td>
<td>HVAC Library Toolset V3.0 Engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation Type of delivery: Software and electronic documentation on CD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>HVAC Library V3.1 Runtime license for one AS automation system Runtime software, software class A, 2 languages (German, English), single license for 1 installation Type of delivery: Runtime license (certificate of license)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6BQ2 001-0AB20-0AC0</td>
<td>HVAC Library V3.0 Runtime license for one AS automation system Runtime software, software class A, 2 languages (German, English), single license for 1 installation Type of delivery: Runtime license (certificate of license)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>HVAC Library V3.1 Runtime license for all AS automation systems of one HVAC project at one location Runtime software, software class A, 2 languages (German, English), floating license for 1 user Type of delivery: Runtime license (certificate of license)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6BQ2 001-0AD20-0AC0</td>
<td>HVAC Library V3.0 Runtime license for all AS automation systems of one HVAC project at one location Runtime software, software class A, 2 languages (German, English), floating license for 1 user Type of delivery: Runtime license (certificate of license)</td>
</tr>
</tbody>
</table>

### More information

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Industry Automation Division  
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Fürth  
E-mail: add-on-support.aud@siemens.com
Overview

In order to guarantee that emergency shutdown valves (ESD valves) of a Safety Instrumented Function (SIF) work correctly when a safety case occurs, their proper functioning must be regularly checked.

This is possible in case of a plant shutdown using a Full Stroke Test. However, since the valve is completely closed during this test procedure, it cannot normally be used during process operation.

The Partial Stroke Test (PST) is an excellent alternative in such a case. During this test, the freedom of movement of the valve is tested by partially opening and closing it, without interrupting the process. More than 50% of the possible valve faults can be detected in this manner. The valve stroke is usually 10 to 15%.

The length of the partial stroke depends on the process conditions and on the diagnostics level required. The test is protected by a safety-related digital output (F-DO) as an alternative method to drive the valve to its safety position if necessary. Thus two separate emergency shutdown signals are present on the valve positioner (1oo2 redundancy).

Partial Stroke Tests can be used to extend the interval between the required Full Stroke Tests without changing the SIL. When these tests are carried out regularly (e.g. 4 times per year), the interval between two full stroke tests can be extended from one year to two years.

The PST library with preconfigured function blocks and faceplates supports automatic implementation of partial stroke tests at the defined intervals.

Note:
The function blocks and faceplates of the PST library can be used together with SIMATIC PCS 7 V6.1, V7.0 and V7.1. The software based on the library S7 F Lib V1.2 or S7 F Lib V1.3 is supplied with one engineering license and one runtime license for an automation system (AS). Another runtime license is required for each additional AS.
Partial Stroke Tests extend the interval between Full Stroke Tests from one year to two years.

**Function**

Main components of the PST library include:

- **PST Engineering Template**
  The PST Engineering Template consists of preconfigured function blocks for setting, implementing and monitoring the partial stroke test, and an optional solenoid test. These blocks permit implementation of the partial stroke test at defined intervals, and provide operator with alarms and feedbacks concerning the valve function. Using PFD calculations (Probability Failure on Demand), the blocks predict the time for the next full stroke test.

- **PST Operator Interface**
  Faceplate for the SIMATIC PCS 7 operator system
  The PST Operator Interface consists of a block icon and a faceplate for visualization and control of the partial stroke test on the SIMATIC PCS 7 operator station. It provides rapid information on the valve state and the PST parameters, displays the status of the last test, and provides information on further planned tests.

- **PST Report**
  The PST Report is a preconfigured report layout for the SIMATIC PCS 7 operator system. It permits automatic documentation of the partial stroke test, and output on a printer.
## PST for SIMATIC PCS 7: Partial stroke test

### Selection and ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial Stroke Test (PST) with S7-400FH and SIMATIC PCS 7 (S7 F Lib V1.2)</td>
<td>J 6BQ2 001-0CA11-0AA0</td>
</tr>
<tr>
<td>based on SIMATIC PCS 7 V6.1 SP1 and higher, V7.0 or V7.1 and S7 F Lib library V1.2</td>
<td></td>
</tr>
<tr>
<td>Function blocks and faceplates, engineering license and runtime license for one AS, 1 language (English)</td>
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<td>Type of delivery: Software on CD as well as Single Licenses for 1 installation (Engineering and Runtime)</td>
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<tr>
<td>Partial Stroke Test (PST) with S7-400FH and SIMATIC PCS 7 (S7 F Lib V1.3)</td>
<td>J 6BQ2 001-0CA12-0AA0</td>
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<tr>
<td>based on SIMATIC PCS 7 V6.1 SP1 and higher, V7.0 or V7.1 and S7 F Lib library V1.3</td>
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<td>Function blocks and faceplates, engineering license and runtime license for one AS, 1 language (English)</td>
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<tr>
<td>Partial Stroke Test (PST) with S7-400FH and SIMATIC PCS 7 V6.1, V7.0 or V7.1</td>
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</table>

J: Subject to export regulations AL: N and ECCN: EAR99S.

### More information

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**AS-Interface block library for SIMATIC PCS 7**

### Overview

**PCS 7 Add-on fit for SIMATIC PCS 7 V7**

Engineering in the CFC library with the blocks of the AS-Interface for SIMATIC PCS 7.

The AS-Interface (AS-i) is an open, cross-vendor bus system for networking simple actuators and sensors (usually binary) in the bottom field area, and allows simultaneous transmission of data and power over one unshielded 2-wire cable.

The AS-Interface can be integrated very simply into the SIMATIC PCS 7 process control system using the AS-Interface block library for SIMATIC PCS 7. Fundamental advantages of the AS-i can then be used:

- Easy installation
- Low wiring costs when using simple actuators and sensors with SIMATIC PCS 7

This block library reduces the engineering requirements for interfacing of the AS-i to SIMATIC PCS 7 to the positioning and interconnecting of AS-i blocks in the CFC. AS-i diagnostics using the SIMATIC PCS 7 maintenance station does not require any additional configuration.

**Note:**

The AS-Interface block library can be used in plants with SIMATIC PCS 7 V6.1, V7.0 and V7.1.

### Design

The AS-Interface block library for SIMATIC PCS 7 contains:

- Blocks for access to the I/O data of AS-i slaves
- Blocks for diagnostics of the AS-i system
- Faceplate for the SIMATIC PCS 7 maintenance station
- Manual and online help

The software delivered on CD is combined with an engineering license for an engineering station and with a runtime license for use of the AS blocks in an automation system. The engineering and runtime licenses are both single licenses.

An additional AS runtime license is required for the second automation system and each additional automation system when using the AS blocks in several automation systems. The AS runtime license is available for this purpose as a separate product without data medium.

### Function

The AS-Interface can be integrated into the process control system in two ways using the AS-Interface block library for SIMATIC PCS 7:

- Direct connection on the PROFIBUS DP per DP/AS-i Link Advanced (AS-i single or double master)
- Connection via a CP 343-2 or CP 343-2P AS-i master module in an ET 200M remote I/O station on the PROFIBUS DP

**Supported AS-i devices**

**AS-i master**

The AS-i block library for SIMATIC PCS 7 supports the following AS-i masters:

- CP 343-2
- CP 343-2P
- DP/AS-i Link Advanced single master
- DP/AS-i Link Advanced double master

**AS-i slaves**

You can use all digital AS-i standard slaves as well as digital AS-i A/B slaves in accordance with the AS-i specification V3.0. Analog AS-i slaves can also be integrated via the DP/AS-i Link Advanced.

**Diagnostics**

Diagnostics is carried out using a faceplate in the SIMATIC PCS 7 maintenance station. Faults in the AS-i devices are additionally signaled in plain text.
### Selection and ordering data

| Order No.   | AS-Interface block library for SIMATIC PCS 7 V6.1, V7.0 and V7.1
|-------------|---------------------------------------------------------------
| 3ZS1 635-1XX01-0YA0 | AS blocks and faceplates for integration of AS-Interface into SIMATIC PCS 7 V6.1, 7.0 and V7.1, electronic documentation as well as:
- Engineering license for one engineering station
- Runtime license for one automation system

- Engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation
- Type of delivery: Software and electronic documentation on CD, engineering and runtime licenses as certificate of license

| Order No.   | AS Runtime license for AS-Interface block library for SIMATIC PCS 7
|-------------|-----------------------------------------------------------------------------------------------------------------------------------
| 3ZS1 635-2XX01-0YB0 | For one automation system each (AS-Interface block library for SIMATIC PCS 7 required)
- Runtime software, software class A, 2 languages (German, English), single license for 1 installation
- Type of delivery: Runtime license as certificate of license without software or documentation

J: Subject to export regulations AL: N and ECCN: EAR99S
The driver blocks from the gas analysis library permit integration of the following gas analyzers into the SIMATIC PCS 7 process control system over PROFIBUS DP:
- ULTRAMAT 6 and ULTRAMAT 23
- CALOMAT
- OXYMAT

The driver blocks permit access to the measured values and to the calibration functions of these devices. They can also be used to evaluate and display diagnostics information, and to trigger alarms if necessary.

Note:
The gas analysis library can be used together with SIMATIC PCS 7 V6 and V7.

**Function**

**Driver blocks**
The gas analyzers are integrated into the hardware configuration of the SIMATIC PCS 7 process control system using their GSD files. Parameterization of the driver blocks is subsequently carried out corresponding to the device configuration. The driver blocks provide the following functions:
- Reading of analyzer values
- Starting of autocalibration
- Evaluation of device-specific diagnostics
- Standard diagnostics
- Alarms for analyzer values (alarm limits adjustable on the block)
- Simulation

**Symbols and faceplates**
The symbols are automatically created and interlinked by the wizard "Generate block symbols". The faceplates can be displayed in various views:
- Standard
- Maintenance
- Configuration
- Limits
- Trend and alarm

**Selection and ordering data**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Gas analysis library for SIMATIC PCS 7 V6 and V7</th>
</tr>
</thead>
<tbody>
<tr>
<td>J 9AE4 110-3AB00</td>
<td>Driver blocks with faceplate for integration of ULTRAMAT 6, ULTRAMAT 23, CALOMAT and OXYMAT gas analyzers in SIMATIC PCS 7 V6 and V7, electronic documentation as well as engineering and runtime license for one automation system each</td>
</tr>
</tbody>
</table>

Engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation

Type of delivery: Software and electronic documentation on CD, engineering and runtime license

J: Subject to export regulations AL: N and ECCN: EAR99S

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You can find additional information in the Internet at:
www.siemens.de/PCS7_Treiberbausteine
Overview

Pumps are of great importance in the process industry because of their large numbers and their functions within a plant. They consume ca. 20% of the global electrical energy consumption of production plants. The failure of a pump may result in very high consequential costs which are many times the value of the pump.

PumpMon, the condition monitoring block offered as an add-on product for SIMATIC PCS 7, permits cost-effective monitoring and analysis of electric centrifugal pumps with constant or variable speeds, with the intention of increasing their efficiency and availability.

The PumpMon block is used to:
- Warning of pump damage resulting from unfavorable operating states (blocking, running dry, gas entrainment, cavitation, overload, wrong direction)
- Early detection of foreseeable pump damage (wear, pump efficiency)
- Optimization of pump dimensioning and thus implicitly the energy efficiency based on statistical evaluation of operating data

PumpMon signals any violations from the nominal pump operating range and deviations from the expected characteristic; it makes available the corresponding values at the block outputs for further processing.

Because the PumpMon block itself does not intervene actively in pump operation, it can be retrofitted at any time without having to fear that the process will be influenced. However, an active intervention (for example, reduction in pump speed if cavitation is imminent) can be implemented specific to an application by evaluating the block outputs.

Note:
The PumpMon condition monitoring block can be used together with SIMATIC PCS 7 V6.1, V7.0 and V7.1.

Function

Options for display and evaluation of pump data and operating states

The following views are available on a PumpMon faceplate:
- Performance data
  - Electrical power consumption of the motor
  - Calculated mechanical shaft output
  - Calculated hydraulic performance of pump including alarm limits
- Delivery characteristic
  - Display of reference delivery height as function of flow rate
  - Display of minimum and nominal flows, current operating point, and absolute and percentage deviations of operating point from characteristic
- Performance characteristic
  - Display of expected (mechanical) pump performance as function of flow, and display of current operating point and its deviation from the characteristic
  - Display of expected hydraulic pump efficiency as function of flow rate, and display of currently determined efficiency
- NPSH characteristic
  - Logarithmic display of NPSHr value for cavitation-free operation as function of flow rate
  - Display of currently calculated NPSHa value
- Histogram
  - Display of pump operating states for flow and cavitation reserve

Diagnostic functions
- Limit violation of performance values
- Operation at partial load, danger of pump overheating
- Violation of nominal flow – overload
- Gas entrainment or cavitation or blocking
- Deviation of operating point from the performance characteristic
- Deviation of operating point from the efficiency characteristic
- Early warning of cavitation

Parameterization of characteristic
- Parameterization of reference pump characteristic through
  - Input of interpolation point coordinates
  - Training by teach function
Libraries/blocks/tools

PumpMon for SIMATIC PCS 7:
Condition monitoring for centrifugal pumps

<table>
<thead>
<tr>
<th>Selection and ordering data</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| **PumpMon Toolset V1.0 for SIMATIC PCS 7 V6.1, V7.0 or V7.1**  
Condition monitoring block with faceplates for monitoring and analysis of centrifugal pumps, engineering license and runtime license for 5 pump instances  
Engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation  
Type of delivery: Software on CD, engineering and runtime license (certificate of license) | J 6BQ2 001-1CA10-0AA0 |
| **PumpMon LIC RUN V1.0 for SIMATIC PCS 7 V6.1, V7.0 or V7.1**  
Runtime license for 10 pump instances each  
Runtime software, software class A, 2 languages (German, English), single license for 1 installation  
Type of delivery: Runtime license (certificate of license) | J 6BQ2 001-1CB10-0AD0 |

J: Subject to export regulations AL: N and ECCN: EAR99S

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Overview

IEC 61850 libraries for SIMATIC PCS 7 are suitable for linking different scopes of network control technology to the process control system. The signaling of critical switchgear statuses by means of alarms on the SIMATIC PCS 7 operator station is just as possible as the integration of small to medium-size switchgear into the process automation with SIMATIC PCS 7.

Function

Engineering

The communication blocks can be positioned in the CFC Editor on a CFC chart. A predefined block with a defined number of variables is available for each device type within specific device families, e.g. SIPROTEC. Additional variables can be added using individual blocks. A connection is created in NetPro to each IEC 61850 device.

The IEC 61850 device library contains symbols and faceplates matched to the communication blocks for visualization on the operator station.

Technical specifications

- Client functionality IEC 61850 MMS (Manufacturing Messaging Specification)
- Up to 16 IEC 61850 devices per CPU of a SIMATIC PCS 7 automation system (depending on availability of memory and cycle time)
- Read and write variables
- Updating cycle < 1 s (depending on cycle time)
- Transfer of original device time stamps to the SIMATIC PCS 7 operator station
- Support of redundant automation systems

IEC 61850 libraries for protective equipment integration in SIMATIC PCS 7

The IEC 61850 protocol based on Ethernet TCP/IP is a globally valid open standard used for the communication of field devices in the protection and control systems of medium-voltage and high-voltage switchgear. This simplifies the configuration, guarantees the compatibility of future expansions, reduces the maintenance requirements, and thus also the total lifecycle costs. Leading manufacturers of protective equipment have therefore already implemented the IEC 61850 protocol in their products.

You can use the IEC 61850 libraries for SIMATIC PCS 7 to integrate the protective equipment of switchgear communicating using the IEC 61850 protocol into the SIMATIC PCS 7 process control system. The range of products comprises two IEC 61850 libraries which differ as follows:

- Universal IEC 61850 communication block library for reading (including time stamp) and writing of IEC 61850 tags
- Special IEC 61850 device library with predefined blocks, symbols and faceplates for a specific device family, e.g. SIPROTEC from Siemens or MiCOM from AREVA T&D

The IEC 61850 communication blocks of these libraries permit complete access to the tags of the protective equipment and control devices (including time stamps). They map the device data and the alarm information provided with the original time stamp of the IEC 61850 protective equipment for visualization on the SIMATIC PCS 7 operator station. Using the symbols and faceplates provided for various device families in the IEC 61850 device library, they can be directly integrated into the operation and monitoring functions of the system.

Note:
The IEC 61850 libraries for SIMATIC PCS 7 can be used together with SIMATIC PCS 7 V7.
### IEC 61850 libraries for protective equipment integration in SIMATIC PCS 7

#### Selection and ordering data

<table>
<thead>
<tr>
<th>Library Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IEC 61850 libraries for integration of protective equipment for SIMATIC PCS 7 V7</strong></td>
<td></td>
</tr>
<tr>
<td>IEC 61850 communication block library for SIMATIC PCS 7</td>
<td>9AE4 110-1AA20</td>
</tr>
<tr>
<td>Communication blocks for connection of protective devices with IEC 61850 protocol to SIMATIC PCS 7 V7, electronic documentation as well as engineering and runtime licenses for one project.</td>
<td></td>
</tr>
<tr>
<td>Engineering and runtime software, software class A, 2 languages (German, English), plant license (naming of plant is necessary)</td>
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<td>Type of delivery: Software and electronic documentation on CD, engineering and runtime license</td>
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</table>

<table>
<thead>
<tr>
<th>Library Description</th>
<th>Order No.</th>
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<td><strong>IEC 61850 device library for SIMATIC PCS 7</strong></td>
<td>9AE4 110-2AA00</td>
</tr>
<tr>
<td>Communication blocks with symbols and faceplates for integration of protective devices of a device family with IEC 61850 protocol into SIMATIC PCS 7 V7, electronic documentation as well as engineering and runtime licenses for one project.</td>
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J: Subject to export regulations AL: N and ECCN: EAR99S

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You can find additional information in the Internet at:  
[www.siemens.de/s7_iec61850](http://www.siemens.de/s7_iec61850)
**Overview**

The Modbus TCP protocol is widely used due to its straightforwardness and openness. Numerous automation technology manufacturers have integrated Modbus TCP in their devices and systems.

The Modbus TCP libraries for SIMATIC PCS 7 permit you to connect devices/systems with Modbus TCP interface to the process control system for implementing diverse applications of different scope.

The Modbus TCP libraries for SIMATIC PCS 7 permit you to transfer data easily and quickly between SIMATIC PCS 7 automation systems (controllers) of the S7-400 series and Modbus TCP servers.

Note:
The Modbus TCP libraries for SIMATIC PCS 7 can be used together with SIMATIC PCS 7 V6 and V7.

**Function**

In the SIMATIC PCS 7 automation system (Modbus TCP Client), the Modbus TCP communication takes place via the CP 443-1 communication module. A connection to the communication partner (Modbus TCP server) must be configured in NetPro via the CP 443-1 communication module.

The communication blocks of the Modbus TCP library can be positioned in the CFC editor on a Continuous Function Chart. Blocks for reading and writing the different Modbus data types are available. The connection diagnostics function is integrated. A changed connection status, e.g. failure or re-establishment, is signaled in the SIMATIC PCS 7 Operator System by means of an alarm.

The redundancy management is also implemented in the communication blocks, e.g. automatic connection switchover.

**Features**

- Modbus TCP Client functionality
- Reading/writing of Modbus variables
- Update cycle of < 300 ms is possible (depends on the cycle time, data volume, network load might be much higher)
- Support of redundant SIMATIC PCS 7 automation systems and redundant communication partners
### Selection and ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
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<tbody>
<tr>
<td><strong>Modbus TCP libraries for SIMATIC PCS 7</strong></td>
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<tr>
<td>Modbus TCP client library for SIMATIC PCS 7 standard automation systems</td>
<td>9AE4 110-1MB10</td>
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<tr>
<td>Communication blocks for the connection of Modbus TCP servers to SIMATIC PCS 7 standard automation systems</td>
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<tr>
<td>Engineering and runtime software, software class A, 2 languages (German, English)</td>
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<tr>
<td>Engineering and Runtime license for a SIMATIC PCS 7 project (the plant must be specified)</td>
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<td>Type of delivery: Software and electronic documentation on CD, project license</td>
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<tr>
<td>Modbus TCP client library for redundant SIMATIC PCS 7 automation systems</td>
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<tr>
<td>Communication blocks for the connection of Modbus TCP servers to redundant SIMATIC PCS 7 automation systems</td>
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<tr>
<td>Engineering and runtime software, software class A, 2 languages (German, English)</td>
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<tr>
<td>Engineering and Runtime license for a SIMATIC PCS 7 project (the plant must be specified)</td>
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Additional information is available on the Internet at:  
[www.siemens.com/PCS7_drivers](http://www.siemens.com/PCS7_drivers)
## Distributed I/O on the PROFIBUS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>7/2</td>
<td>Function blocks for SIWAREX weighing modules</td>
</tr>
<tr>
<td>7/4</td>
<td>Drive ES PCS 7: Function blocks for drives</td>
</tr>
<tr>
<td>7/6</td>
<td>PCS 7 SIMOCODE pro: Function block library for motor management system</td>
</tr>
<tr>
<td>7/8</td>
<td>AddFEM: Redundant I/O module for fast response times</td>
</tr>
<tr>
<td>7/12</td>
<td>Field barrier &quot;-FB-Ex4.&quot;: Intrinsically-safe distribution block</td>
</tr>
<tr>
<td>7/14</td>
<td>AirLINE Ex: Pneumatic block for integration into ET 200iSP</td>
</tr>
<tr>
<td>7/16</td>
<td>SIMATIC RF: RFID systems</td>
</tr>
<tr>
<td>7/17</td>
<td>KSB PumpDrive for SIMATIC PCS 7: Speed control for centrifugal pumps</td>
</tr>
</tbody>
</table>
Overview

Level, proportioning, belt, and loss-in-weight scales in process engineering applications can be quickly and efficiently configured using preconfigured weighing blocks.

For the SIMATIC PCS 7 process control system, Siemens offers configuration packages with function blocks for the SIWAREX U, SIWAREX FTA and SIWAREX FTC weighing modules. These weighing blocks are suitable for both standard and fault-tolerant automation systems. In the case of fault-tolerant automation systems, access to the single SIWAREX U/FTA/FTC weighing modules can be made via both subsystems.

The weighing blocks supplied with faceplate allow not only the rational integration of the SIWAREX U/FTA/FTC weighing modules into the engineering system, but also the user-friendly operation of the scales by means of the SIMATIC PCS 7 operator stations. Integrated signaling behavior and maintenance functions such as the reading or writing of all scale parameters ensure short standstill times and help to increase the availability.

The pixel-graphics engineering with the CFC editor is very clear and easy to use. The use of prepared blocks also eliminates possible sources of errors and reduces the configuration costs.

Note:
The function blocks and faceplates for the SIWAREX U/FTA/FTC weighing modules can be used together with SIMATIC PCS 7 V6 (except SIWAREX FTC_L) and V7. The following applies here:

- The SIWAREX U configuration package for SIMATIC PCS 7 V6 (7MH4 683-3BA64) can also be used for SIMATIC PCS 7 V7.
- The SIWAREX U configuration package for SIMATIC PCS 7 V6 (7MH4 683-3BA64) is suitable for the SIWAREX U modules 7MH4 601-1AA01 and 7MH4 601-1BA01. However, it can also be used for the modules 7MH4 950-1AA01 and 7MH4 950-2AA01.
- The SIWAREX U configuration package for SIMATIC PCS 7 V7 (7MH4 950-3AK61) can only be used for the SIWAREX U modules 7MH4 950-1AA01 and 7MH4 950-2AA01. It has a significantly greater range of functionalities than the configuration package for SIMATIC PCS 7 V6.
### Selection and ordering data

<table>
<thead>
<tr>
<th>SIWAREX U configuration package</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>consisting of: Function block, faceplate, parameterizing software and manual, 2 languages (German, English), engineering license for SIWAREX U, single license for 1 installation</td>
<td>7MH4 950-3AK61</td>
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<tr>
<td>Engineering and runtime software, software class A</td>
<td></td>
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<tr>
<td>Type of delivery: Software and electronic documentation on CD, engineering license (certificate of license)</td>
<td>7MH4 683-3BA64</td>
</tr>
<tr>
<td>• For SIMATIC PCS 7 V7.0 and V7.1</td>
<td></td>
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<tr>
<td>• Suitable for 7MH4 950-1AA01 and 7MH4 950-2AA01</td>
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<tr>
<td>• For SIMATIC PCS 7 V6.0 and V6.1</td>
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<table>
<thead>
<tr>
<th>SIWAREX FTC_B configuration package</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>consisting of: Function block, faceplate, parameterizing software and manual, 2 languages (German, English), engineering license for SIWAREX FTC, single license for 1 installation</td>
<td>7MH4 900-3AK63</td>
</tr>
<tr>
<td>Engineering and runtime software, software class A</td>
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<tr>
<td>Type of delivery: Software and electronic documentation on CD, engineering license (certificate of license)</td>
<td>7MH4 900-3AK61</td>
</tr>
<tr>
<td>• For SIMATIC PCS 7 V7.0 and V7.1</td>
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<tr>
<td>• For SIMATIC PCS 7 V6.0 and V6.1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIWAREX FTC_L configuration package (loss-in-weight scales) for SIMATIC PCS 7 V7.0 and V7.1</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>consisting of: Function block, faceplate, parameterizing software and manual, 2 languages (German, English), engineering license for SIWAREX FTC, single license for 1 installation</td>
<td>7MH4 900-3AK64</td>
</tr>
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<td>Engineering and runtime software, software class A</td>
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</tbody>
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Drive ES PCS 7 enables Siemens drives to be controlled via SIMATIC PCS 7 and operated and monitored in the operator station. The Drive ES PCS 7 faceplates make all the relevant data for plant operation available on the operator station.

Drive ES PCS 7 for SIMATIC PCS 7 V6.1 or higher additionally provides all drive data relevant to the PCS 7 Asset Management for display on the maintenance station.

For parameterization, commissioning and detailed diagnostics of the drive, it is recommended that you also use Drive ES Basic on the engineering station.

Note:
Drive ES PCS 7 can be used together with SIMATIC PCS 7 V6 and V7.
### Selection and ordering data

<table>
<thead>
<tr>
<th>Drive ES PCS 7 and Drive ES Basic configuration software for SIMATIC PCS 7</th>
<th>Order No.</th>
<th>Drive ES PCS 7 Upgrade and software update service</th>
</tr>
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<tbody>
<tr>
<td>Drive ES PCS 7</td>
<td>Function blocks and faceplates for integration of SIMOVERT MASTERDRIVES, MICRO-MASTER, SIMOREG DC-MASTER, and SINAMICS S/G variable-speed drives into SIMATIC PCS 7; with electronic documentation (5 languages)</td>
<td>6SW1 700-5JD00-1AC0</td>
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<tr>
<td></td>
<td>• Engineering license for one engineering station</td>
<td>6SW1 700-7JD00-1AA0</td>
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<tr>
<td></td>
<td>• Runtime license for one automation system</td>
<td>6SW1 700-7JD00-0AA0</td>
</tr>
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<td></td>
<td>Engineering and runtime software, software class A, 5 languages (German, English, French, Italian, Spanish), single license for 1 installation</td>
<td>6SW1 700-6JD00-1AA0</td>
</tr>
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<td></td>
<td>Type of delivery: certificates of license; software and electronic documentation on CD</td>
<td>6SW1 700-6JD00-0AA0</td>
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<td>• For SIMATIC PCS 7 V7.1</td>
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<td>• For SIMATIC PCS 7 V7.0</td>
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<td></td>
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</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### More information

Siemens AG  
Industry Sector  
Drive Technologies Division  
Motion Control Systems  
Erlangen  
Phone: +49 9131 98-4107/5133  
Fax: +49 9131 98-1420  
Current product information, FAQs and manuals can also be found at Siemens Product Support under "Drive technology – Configuration and commissioning software – Drive ES configuration software"  
You can find additional information in the Internet at:  
www.siemens.com/drive-es
Overview

The PCS 7 SIMOCODE pro block library can be used to conveniently integrate the SIMOCODE pro motor management system into the SIMATIC PCS 7 process control system.

The library comprises:

- Blocks for the automation system (AS)
  - Driver blocks
  - Motor blocks
  - Measured-value and statistics block
  - Time stamping block
- Elements for operation and monitoring (symbols and faceplates) using an operator station (OS)

The library supports the CFC function "Generate module driver" which allows system-conformant integration into the SIMATIC PCS 7 driver concept and minimizes the configuration requirements. Using the library blocks, SIMOCODE pro can also be integrated into the asset management with the SIMATIC PCS 7 Maintenance Station. There are no additional configuration requirements.

Note:

The PCS 7 SIMOCODE pro block library can be used together with SIMATIC PCS 7 V6 and V7.

Application

The blocks of the PCS 7 SIMOCODE pro library integrate the SIMOCODE pro motor management system into the SIMATIC PCS 7 process control system into the SIMATIC PCS 7 process control system V6.0, V6.1, V7.0 or V7.1 over PROFIBUS DP.

The SIMOCODE pro motor management system has been designed for use in Motor Control Centers (MCC) in the process industry and power plant engineering.

Plant downtimes can be efficiently prevented using the detailed operating, service and diagnostics data of SIMOCODE pro. In the event of a fault, you are able extremely quickly to determine and eliminate the cause. SIMOCODE pro is therefore particularly suitable for the automation of processes where a plant downtime would result in very high costs.

Function

The blocks of the PCS 7 SIMOCODE pro library work together with SIMOCODE pro devices on the PROFIBUS DP which are operated either directly behind a PROFIBUS DP master system (standard automation systems) or behind a Y-Link (fault-tolerant automation systems).

The signal processing and technological functions of the blocks are oriented according to the SIMATIC PCS 7 standard libraries (driver blocks, technological blocks), and are optimally matched to the functions of the motor management system.

Users who have previously configured motor feeders in conventional technology using signal blocks and motor or valve blocks can therefore easily convert to the PCS 7 SIMOCODE pro library.

The optional measured-value and statistics block makes available numerous measured values and statistics information of the SIMOCODE pro motor management system in addition to the comprehensive diagnostics information. The time stamp block permits the SIMOCODE pro V time stamping function to be used for SIMATIC PCS 7. It transfers the signals already provided in the device with a time stamp to the automation system, and enters them into the operator system's message list.

The library blocks support all SIMOCODE pro control functions:

- Overload (OVL)
- Direct-on-line starter, soft starter (DIR, SOFT)
- Reversing starter, soft starter with reversing contactor (REV, SOFT)
- Star-delta (STAR)
- Star-delta with reversing (REVS)
- Dahlander, pole-changing switch (DAHL, POL)
- Dahlander, pole-changing switch with reversing (DAHL REV, POL REV)
- Valve, positioner (VALVE, POS)
- Circuit-breaker (CB)
### Selection and ordering data

**Order No.**

<table>
<thead>
<tr>
<th>SIMATIC PCS 7 block library SIMOCODE pro</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AS modules and faceplates for integrating SIMOCODE pro into SIMATIC PCS 7 with:</td>
<td></td>
</tr>
<tr>
<td>• Engineering license for one engineering station</td>
<td></td>
</tr>
<tr>
<td>• Runtime license for one automation system</td>
<td></td>
</tr>
<tr>
<td>Engineering and runtime software, software class A, 3 languages (German, English, French), single license for 1 installation</td>
<td></td>
</tr>
<tr>
<td>Type of delivery: certificates of license; software and electronic documentation on CD</td>
<td></td>
</tr>
<tr>
<td>• V6.0 for SIMATIC PCS 7 V6.0</td>
<td>3UF7 982-0AA00-0</td>
</tr>
<tr>
<td>• V6.1 for SIMATIC PCS 7 V6.1</td>
<td>3UF7 982-0AA02-0</td>
</tr>
<tr>
<td>• V7.0 für SIMATIC PCS 7 V7.0/V7.1</td>
<td>3UF7 982-0AA10-0</td>
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<td>3UF7 982-0AA13-0</td>
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<table>
<thead>
<tr>
<th>SIMATIC PCS 7 AS Runtime license SIMOCODE pro</th>
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</thead>
<tbody>
<tr>
<td>for execution of AS blocks for SIMOCODE pro in an automation system</td>
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<td>Type of delivery: certificate of license</td>
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<td>• V6.x for SIMATIC PCS 7 V6.0/ V6.1</td>
<td>3UF7 982-0AA01-0</td>
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<td>• V7.x for SIMATIC PCS 7 V7.0/ V7.1</td>
<td>3UF7 982-0AA11-0</td>
</tr>
</tbody>
</table>

J: Subject to export regulations AL: N and ECCN: EAR99S
Distributed I/O on the PROFIBUS

AddFEM: Redundant I/O module for fast response times

Overview

The **Front End Module** AddFEM is an autonomous unit for the input/output of analog and digital process signals that can be connected with standardized protocols via the PROFIBUS DP fieldbus to the SIMATIC PCS 7 automation system. Its fast response times for signal acquisition and processing should be particularly emphasized.

The product range consists of two versions:
- **AddFEM**
  - 12 analog inputs
  - 8 analog outputs
  - 12 digital inputs
  - 16 digital outputs (can also be configured as digital inputs)
  - 3 counter/timer inputs (can also be configured as digital inputs)
- **AddFEM SoE (Sequence of Event) with a preprocessing Front End Function (FEF)**
  - 31 digital inputs with highly exact time tagging.

Both product versions can be operated in redundant pairs. The advantage of AddFEM redundancy is that the switchover in this case takes place independent of the automation system (CPU).

**Note:**
AddFEM can be used together with SIMATIC PCS 7 V6 and V7.

Benefits

- Modules for operation independently or redundant in pairs
- Fast response times for signal acquisition and processing as well as for redundancy switchover (switchover time less than 500 µs) of the AddFEM
- Extended level ranges for analog signals and counters of the AddFEM
- Analog and digital areas electrically isolated from one another
- Permanently short-circuit-proof analog and digital inputs
- Monitoring of all outputs
- Outputs can be connected in parallel with other outputs (redundancy, increase in performance)

Design

Built into a rugged high-grade steel housing, which is in line with the SIMATIC S7 design in terms of dimensions and shape, the AddFEM meets stringent environmental requirements. It is prepared for mounting on DIN rails and for direct mounting with bolts. These installation options support both freestanding construction and installation in cabinets or wall-mounted housings.

The connecting elements are protected by a removable hood on which the connector pin assignment of the peripheral signals is printed. The functions are set by means of two mode selectors and indicated by 12 LEDs. In accordance with the PLC standard, 2 x 16 LEDs are available in the display panel of the module for signaling the binary I/O signals.

Function

**AddFEM**

The various signal types with AddFEM are distributed across the process connections in such a way that a single module is often sufficient for small applications. Applications with a large quantity framework can be implemented by using several modules.

The measuring ranges of the analog inputs and outputs are designed so that no additional signal transducers have to be used. By means of an additional current range of ± 50 mA for the analog outputs, actuators with higher power requirements, e.g. fuel control valves, can also be controlled without additional signal amplifiers.

**AddFEM SoE (Sequence of Event) with a preprocessing Front End Function (FEF)**

The Front End Module AddFEM SoE is tailored to the special applications in power plant and process control technology where exact time tagging is required when recording changes in signals, e.g. for archiving the statuses of a power plant for analysis of incidents or for general logging.

The AddFEM is synchronized by the GPS time server, and tags the binary signals with an accuracy of 1 ms.

The integrated redundancy in 3 levels and the fast, stand-alone switching over guarantee high availability. The module communicates with the automation system over the redundant PROFIBUS DP.

The AddFEM SoE requires the AddFEM SoE repeater module for on-site signal distribution, adaptation of the medium (glass FOC to plastic FOC) and signal inversion.
Function (continued)

AddFEM SoE repeater module

The SoE repeater module can be extended by up to 5 SoE repeater extension modules, and forms a unit together with these.

Since the SoE repeater module can be cascaded, up to 5 of such units can be connected in series.

SoE repeater module and SoE repeater extension module have no intelligence whatsoever. The logic of the input signal is inverted without changing its timing and connected to the outputs.

Up to 6 AddFEM SoE modules can be connected via plastic FOCs to each module. The service interface X1 present on the AddFEM SoE (see graphic) is used as the signal input.

Large distances have to be covered between the GPS time server and the AddFEM SoE. Therefore glass FOCs are used as the transmission medium between the GPS time server and the SoE repeater module.

SoE repeater module, SoE repeater extension module and AddFEM SoE are mounted together in the electronics cabinet. The SoE repeaters are mounted on a rail TH 35 – 7.5 EN 60 715 or TH 35 – 15 EN 60 715.

The SoE repeater module is powered with 24 V DC. It supplies the SoE repeater extension module of the unit via a rail bus connector.

![Diagram of Distributed I/O on the PROFIBUS](image-url)
### Technical specifications

#### General data

<table>
<thead>
<tr>
<th>AddFEM/AddFEM SoE</th>
<th>Dimensions (H x W x D) in mm</th>
<th>295 x 75 x 209</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weight</td>
<td>2.8 kg</td>
</tr>
<tr>
<td></td>
<td>Supply voltage</td>
<td>24 V DC</td>
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<tr>
<td></td>
<td>Bridging of power failures</td>
<td>10 ms (minimum)</td>
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<tr>
<td></td>
<td>Power consumption</td>
<td>20 W</td>
</tr>
</tbody>
</table>

#### PROFIBUS DP interfaces

|                   | Number of interfaces | 2 |
|                   | Baud rate            | 12 Mbit/s     |
|                   | Max. cable length of a bus segment | 100 m |
|                   | Connectable load per interface | 5 V, max. 80 mA |

#### Digital inputs (parameterizable)

|                   | Quantity | 12 |
|                   | Type of input | Type 1 compliant with IEC 1131-2 |
|                   | Voltage range | -30 ... +33 V DC |
|                   | 0 signal level | -30 ... +5 V DC |
|                   | 1 signal level | +11 ... +30 V DC |
|                   | Galvanic isolation | 3 groups with 4 digital inputs each |
|                   | Display | LED in display panel |

#### Digital outputs (parameterizable)

|                   | Quantity | 16 |
|                   | Type of output | Digital semiconductor outputs |
|                   | Nominal output voltage | 24 V DC |
|                   | Output voltage with 0 signal | < 1 V |
|                   | Output voltage with 1 signal | Power supply less 2 V |
|                   | Rated output current | 500 mA |
|                   | Short-circuit proof | Yes |
|                   | Short-circuit-to-ground monitoring | Yes (internal monitoring) |
|                   | Galvanic isolation | Yes (8 outputs each with same reference potential) |

#### Analog inputs (parameterizable)

|                   | Inputs, total | 12 |
|                   | Measurement range of currents inputs (parameterizable) | 0 ... 20 mA |
|                   | Measuring range of voltage input (parameterizable) | 0 ... 10 V |
|                   | Input impedance, current | 41.8 Ω |
|                   | Input impedance, voltage | 100 kΩ |
|                   | Max. error (over the entire temperature range) | 0.2% relative to full-scale value |
|                   | Resolution of A/D converter | 13 bit + sign |
|                   | Conversion method | Successive approximation |

#### Analog outputs (parameterizable)

|                   | Outputs, total | 8 |
|                   | Current output range | 0 ... 20 mA (500 Ω) |
|                   | Unipolar | 4 ... 20 mA (500 Ω) |
|                   | Current output range | ±20 mA (500 Ω) |
|                   | Bipolar | ±50 mA (300 Ω) |
|                   | Max. error (over the entire temperature range) | 0.4 % |
|                   | Resolution of A/D converter | 13 bit + sign |

#### Counting pulse input (parameterizable)

|                   | Number of inputs | 3 |
|                   | Type of input | Type 1/2 compliant with IEC 1131-2 |
|                   | Voltage range | ±33 V DC |
|                   | 0 signal level | -28 ... +3 V |
|                   | 1 signal level | +8 ... +28 V |
|                   | Load | 1 ... 3 kΩ |
|                   | Input frequency (f_in) | 0 ... 20 kHz |
|                   | Counter resolution | 1/60 000 referred to measured value |
|                   | Updating interval | 2 ms |

#### Digital inputs with time tagging: AddFEM SoE

|                   | Quantity | 31 |
|                   | Time resolution | 1 ms |

#### Approvals/markings

|                   | UL Recognition Mark | Underwriters Laboratories (UL) compliant with Standard UL 508 File E 85972 |
|                   | CSA Certification Mark | Canadian Standard Association (CSA to Standard C22.2 No. 142 File LR 63533) |
|                   | CE marking | Compliant with EU directive 89/336/EEC “Electromagnetic compatibility” |
|                   | Quality assurance | According to ISO 9001 |
### Selection and ordering data

<table>
<thead>
<tr>
<th>Front End Modules</th>
<th>Order No.</th>
</tr>
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<tbody>
<tr>
<td>Front End Module AddFEM</td>
<td>6DL3 100-8AC</td>
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<tr>
<td>PROFIBUS DP I/O module with redundancy feature for fast response times, operable on automation systems of the SIMATIC PCS 7 V6/V7 process control system</td>
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<tr>
<td>Front End Module AddFEM SoE</td>
<td>6DL3 100-8AC03</td>
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<tr>
<td>PROFIBUS DP I/O module with redundancy feature for highly exact time stamping, operable on automation systems of the SIMATIC PCS 7 V6/V7 process control system</td>
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### Accessories

<table>
<thead>
<tr>
<th>Connection elements for AddFEM</th>
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<tbody>
<tr>
<td>Plug set with screw-type terminals</td>
<td>6DL9 900-8AA</td>
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<tr>
<td>Plug set with spring-loaded terminals</td>
<td>6DL9 900-8AB</td>
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<tr>
<td>Redundant connection Fiber-optic cable 1.6 m</td>
<td>6DL9 901-8AA</td>
</tr>
<tr>
<td>SoE repeater module 6 channels</td>
<td>6DL9 200-8AA</td>
</tr>
<tr>
<td>SoE repeater extension module 6 channels</td>
<td>6DL9 201-8AA</td>
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<tr>
<td>Cable between time server and SoE repeater Glass FOC, length:</td>
<td>6DL9 902-8AA</td>
</tr>
<tr>
<td>• 15 m</td>
<td>6DL9 902-8AB</td>
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<tr>
<td>• 25 m</td>
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<tr>
<td>Cable between SoE repeater and AddFEM SoE Plastic FOC, length:</td>
<td>6DL9 903-8AA</td>
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<td>• 1.5 m</td>
<td>6DL9 903-8AB</td>
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<td>• 2.5 m</td>
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Distributed I/O on the PROFIBUS

Field barrier "-FB-Ex4.*": Intrinsically-safe distribution block

Overview

PCS 7 Add-on fit for SIMATIC PCS 7 V7

The field barrier "-FB-Ex4.* is an intrinsically safe distribution block for connecting up to 4 intrinsically safe fieldbus nodes via spur lines. It is connected via non-intrinsically-safe connections to the trunk line of a fieldbus whose physical system complies with the international standard IEC 61158-2. This can be either a PROFIBUS PA or a FOUNDATION Fieldbus H1.

Note:
The field barrier "-FB-Ex4.* can be used together with SIMATIC PCS 7 V6 and V7.

Benefits

- Can be used in Zone 1/21
- Four intrinsically-safe and short-circuit-proof spur line outputs of 40 mA each for cable lengths up to 120 m
- Electrical isolation between the non-intrinsically-safe fieldbus (trunk line) and the intrinsically-safe outputs
- Limiting of the short-circuit current at the output prevents the failure of further outputs
- Use of cheaper power supplies/routers without intrinsically-safe interface
- High number of nodes per fieldbus segment
- Longer bus distances can be implemented than with a completely intrinsically-safe fieldbus
- No additional distribution boxes required
- Maintenance work possible on the field device during plant operation

Design

Field barrier "-FB-Ex4.* mounted in different housing versions (from top: polyester, stainless steel, aluminum)

The field barrier "-FB-Ex4.* is available in a field housing. The housing is available in different versions:
- Glass fiber reinforced polyester (GRP)
- Stainless steel
- Aluminum

Configurable standard solutions offer a wide range of possibilities. The field housing can be matched to almost any requirement through use of various screw connections and optional accessories. Pepperl+Fuchs additionally has the appropriate competence and experience for creating customized solutions on the basis of a specification.

A version without field housing is also available and is suitable for assembly on a DIN rail in a control cabinet.

The designation "-FB-Ex4.*" of the field barriers is also the core of the Order No. It can be specified further at the positions identified by "**". Selection from a defined range is then possible according to the application:

- Housing type
- Type of cable connection
- Connections for trunk and spur lines

Further information can be obtained directly from the manufacturer, see "Further info". See also

Function

The field barrier "-FB-Ex4." is certified for use in Zone 1/21. A main line which is installed protected (Ex e) connects the field barriers in this zone via their Ex e terminals to a non-intrinsically-safe gateway. This allows a high supply current to be used in the fieldbus segment. The main conductor requires a bus terminator at its end. A selectable terminating resistor is integrated in the field barrier for this purpose.

The field barrier electrically separates the 4 intrinsically-safe (Ex ia IIC) and short-circuit-proof spur line outputs from the main line. The outputs correspond to IEC 60079 and comply with the FISCO and Entity criteria. A field device can be connected to each output. 43 mA are available per output for the intrinsically-safe power supply. Limiting of the current and voltage at each output prevents the complete fieldbus segment from failing should there be a fault at one output. The spur lines can be up to 120 m long. An additional bus terminating resistor is not required.

As a result of the low installation requirements, simple connection system and high flexibility, fieldbus architectures with field barriers prove to be extremely efficient, especially for planning, installation and maintenance.

Dimensional drawings

Connections for the non-intrinsically safe fieldbus segment

Connections for intrinsically safe fieldbus devices

Block diagram of "-FB-Ex4." field barrier

More information

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Fax: +49 621 776 - 1000

E-mail: pa-info@de.pepperl-fuchs.com

You can find additional information in the Internet at:

www.pepperl-fuchs.de
AirLINE Ex 8650 is a pneumatic valve block specially developed for the ET 200iSP distributed I/O system of SIMATIC PCS 7, and is used to control process and production sequences in hazardous areas of Zone 1/21. Through integration of the pneumatic valve block into the ET 200iSP station, the latter’s electric I/O functions are expanded by pneumatic 3/2-way or 5/2-way control functions.

Pneumatic functions reduce the costs for wiring and the associated documentation. They save space, simplify the proof of intrinsic safety, and have a favorable effect on the power loss and the associated self-heating.

Typical fields of application can be found in process and production automation associated with biotechnology and in the pharmaceutical and chemical industries.

Note:
As an integral component of the ET 200iSP, the AirLINE Ex 8650 pneumatic valve block can be used together with SIMATIC PCS 7 V6.1 or V7. It is linked using the IM 152-1 interface module of the ET 200iSP station. It is supported by means of the Generic Station Description (GSD), the Electronic Device Description (EDD) and the Hardware Support Package (HSP).

Design
In the context of the AirLINE Ex 8650 pneumatic valve block, every assembly comprising terminal module, function module and pneumatic module is referred to as "slice".

A valve slice comprises the terminal module with the permanent wiring, equipped with an electronic basic module and a pneumatic basic module. The valves are then mounted on the basic module.

The valves and their electronic modules are intrinsically-safe (Ex i). For servicing purposes, they can be replaced during ongoing operation. They are easy to install and remove from the front.

The AirLINE Ex 8650 pneumatic valve block is supplied with compressed air via pneumatic connection washers, and the exhaust air is also discharged in this manner. A connection washer on each side terminates the pneumatic backplane on the left and right to the modules of the ET 200iSP. Valve slices for the two available air supplies of 300 l/min and 700 l/min can be mixed in between as desired.

Depending on the configuration, smaller supply elements can be produced using further pneumatic connection washers for intermediate supply. It is then possible to ensure the air supply for all valves even in critical situations, and to produce segments for different pressures.

A configurator from Bürkert Fluid Control Systems can help you in the selection and combination of components. It will provide you with:
- Documentation
- Materials list
- Dimensions
- Various illustrations for your configuration

Design of a valve slice (terminal module on left, electronic basic module at top, pneumatic basic module at bottom, valves)
Function

The AirLINE Ex 8650 pneumatic valve block can be used to implement 3/2-way and 5/2-way functions for controlling process valves, single-action or double-action pneumatic cylinders, linear or rotary actuators, etc. The valve slices for air supplies of 300 l/min or 700 l/min act like digital output modules. They convert the electric control signals of the interface module into pneumatic output signals.

The valves themselves have a low power consumption and permit high pressures to be switched with short switching times. They are optionally available with or without manual emergency actuation. Versions are also available with a separate auxiliary control air supply for use in an extended pressure range or with a non-return valve for venting connections. The configuration can be individually adapted using optional baffle elements or pressure shut-offs.

Up to 88 valve functions can be configured depending on the types of valve used.

The electronics modules of the valve slices display the modules status (group fault display) and the channel status (channel open/closed) on LEDs. Status, diagnostics and switching cycle counters of the channels can be read out via PROFIBUS.

Technical specifications

<table>
<thead>
<tr>
<th>AirLINE Ex</th>
<th>88 (depending on type of valve)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of valve functions</td>
<td>88 (depending on type of valve)</td>
</tr>
<tr>
<td>Max. width of complete station</td>
<td>1185 mm</td>
</tr>
<tr>
<td>Rated flow</td>
<td>300 l/min or 700 l/min</td>
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<tr>
<td>Pressure range</td>
<td>0 … 8 bar</td>
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<tr>
<td>Ambient temperature in operation</td>
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<tr>
<td>• Horizontal installation</td>
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<td>• All other mounting positions</td>
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<td>Approvals</td>
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</tbody>
</table>

More information

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www.burkert.com
Overview

Radio Frequency Identification (RFID) systems for contactless identification and localization of products as well as for automatic recording and storage of data have already been tried and tested in numerous manners for automation technology. Such systems use mobile data carriers (tags) to identify products, and readers to monitor the data in the tags.

Using the SIMATIC RF RFID systems from Siemens it is possible to perfectly control and optimize the material flow and the complete logistics sequence. The systems are also highly suitable for container management and asset management.

Note:
The SIMATIC RF identification systems can be used together with SIMATIC PCS 7 V6 and V7.

Function

SIMATIC RF RFID systems with a tag memory of up to 64 KB can be parameterized in many different manners. An application example with a CFC block on the CD "RFID Systems Software & Documentation" provides you with effective support. In order to utilize the full functionality of the RFID system for SIMATIC PCS 7, this example can be changed or extended as required. A customized CFC block can also be created by direct adaptation of the function blocks FB/FC 45.

Selection and ordering data

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<tr>
<th>ASM 456 communication module</th>
<th>6GT2 002-0ED00</th>
</tr>
</thead>
<tbody>
<tr>
<td>For connecting two read devices directly to PROFIBUS</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ASM 475 communication module</th>
<th>6GT2 002-0GA10</th>
</tr>
</thead>
<tbody>
<tr>
<td>For SIMATIC S7-300 and ET 200M; for connecting two read devices</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>RFID Systems Software &amp; Documentation</th>
<th>6GT2 080-2AA10</th>
</tr>
</thead>
<tbody>
<tr>
<td>With FB/FC for SIMATIC/SIMATIC PCS 7, application example and RFID documentation in 2 languages (German, English) Engineering software, software class A, 5 languages (German, English, French, Italian, Spanish), single license for 1 installation Type of delivery: Software and electronic documentation on CD</td>
<td></td>
</tr>
</tbody>
</table>

I: Subject to export regulations AL: N and ECCN: EAR99H

More Information

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KSB PumpDrive for SIMATIC PCS 7: Speed control for centrifugal pumps

Connection to SIMATIC PCS 7
The following components are required for the connection to SIMATIC PCS 7:
- Software package KSB PumpDrive for SIMATIC PCS 7
- PROFIBUS module
  is offered by KSB as a PROFIBUS accessory set for the KSB PumpDrive
The software package KSB PumpDrive for SIMATIC PCS 7 contains the following components:
- Block library with:
  - Diagnostics block for integration into the SIMATIC PCS 7 driver concept
  - Signal block for control of a pump module
  - Block for maintenance station
  - Data block with parameter data sets
- Faceplate

Function
The faceplate allows direct access to all significant functions and states of the KSB PumpDrive:
- Controlled variables
- Speed (freely selectable from 0 to 70 Hz)
- Multi-pump operation with up to 6 pumps
- Switching-over of authorizations (local)
- Display of:
  - Operating values (speed, current, actual value, etc.)
  - Fault history
  - Energy demand meter (kWh)
  - Operating hours counter (motor, frequency converter)
  - Display of current delivery rate – sensorless
- Status of protection functions
  - Thermal motor protection
  - Electrical motor protection
  - Dynamic overload protection through speed limiting
  - Protection against running dry (sensorless or by external switching signal)
  - Performance data monitoring (avoidance of illegal operating states of hydraulics on basis of pump characteristic)

More information
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Fax: +49 6233 86-9401
Hotline KSB Automation: +49 6233 86-2042
You can find additional information in the Internet at:
www.ksb.com

Overview
KSB PumpDrive is a control device based on state-of-the-art frequency converter technology for energy-efficient and low-wear operation of centrifugal pumps.
KSB PumpDrive and corresponding sensors convert pumps into an intelligent, variable-speed pump system – either for individual operation or for multi-pump operation with up to 6 pumps.
Such a pump system can be easily integrated into the SIMATIC PCS 7 process control system using the software package KSB PumpDrive for SIMATIC PCS 7.

Note:
The software package KSB PumpDrive for SIMATIC PCS 7 can be used together with SIMATIC PCS 7 V6.1, V7.0 and V7.1.

Design
KSB PumpDrive is a self-cooled frequency converter with control unit which allows continuous adjustment of the pump performance to the respective requirements.
KSB PumpDrive has an integral, adjustable PI controller for:
- Differential pressure control
- Level control
- Temperature control
- Flow control
- Pressure control with setpoint tracking depending on the delivery rate
As a result of its self-cooling, the KSB PumpDrive can be mounted on the motor (MM), on a wall (WM), or in a control cabinet (CM).
8 Simulation

8/2 Introduction

8/3 SIMBapro FAT: Fieldbus simulation with Factory Acceptance Test

8/6 SIMIT: Simulation-based engineering
The following products are currently available for testing and simulation of an entire SIMATIC PCS 7 system or individual process control levels (automation level, field level ...):

- **S7-PLCSIM**
  - SIMATIC PCS 7 standard product for the function testing of CFC/SFC application software on PCs/PGs; refer to main catalog ST PCS 7 for description and ordering data

- **SIMBapro FAT**
  - SIMATIC PCS 7 add-on product based on SIMBA Profibus for field bus simulation (PROFIBUS DP), including numerous functions for the factory acceptance test (FAT) at unit level

- **SIMIT**
  - SIMATIC PCS 7 add-on product for dynamic plant simulation, for example, for the overall plant test or for operator training
SIMBApro FAT is based on SIMBA Profibus, a system which is able to simulate the devices (PROFIBUS slaves) connected on the PROFIBUS DP fieldbus and the units operated on them (valves, motors, etc.). Of particular importance for the SIMATIC PCS 7 process control system is that SIMBA Profibus can also simulate safety-related and redundant PROFIBUS slaves.

The simulation is reaction-free, i.e. it is irrelevant for the SIMATIC PCS 7 automation system (controller) as the master whether it communicates with real or simulated PROFIBUS slaves.

Several PROFIBUS lines with simulated PROFIBUS slaves can be operated in parallel on one automation system. A PROFIBUS line can be completely simulated. However, real and simulated PROFIBUS slaves can also be combined together on a PROFIBUS line.

Simple tests are possible by activating and monitoring the inputs/outputs. A comprehensive range of typicals supports operator control and monitoring of the individual PROFIBUS slaves as well as triggering of process and diagnostics alarms.

Predefined equipment typicals are available for the Factory Acceptance Test (FAT) of plants. The simulation structure for the Factory Acceptance Test (FAT) can be created rapidly and simply using predefined simulation functions and various import options (e.g. hardware configuration from HW Config or equipment feedbacks from symbol table).

Note:
SIMBApro FAT can be used together with SIMATIC PCS 7 V6 and V7.
Simulation

SIMBApro FAT: Fieldbus simulation with Factory Acceptance Test

Benefits
- Increase in quality standards for products and systems
- Saving of investments for test, commissioning and training systems
- Fast and low-cost conversion to new plant configurations
- Shortening of commissioning time as result of tested configurations
- Early detection and elimination of configuration errors
- Risk-free operator training

Application

Configuration/engineering
- Default settings, reading and modification of digital and analog inputs/outputs
- Early testing of project-specific blocks (technological function, alarm behavior), example solutions and sequencers
- Integration of mathematical formulas and simple linking of analog values

Factory Acceptance Test
- Test without modifying the original software
- Test of elementary automation functions (measurement and control loops, switching function)
- Integration test of the entire automation architecture
- Performance test through use of load generators
- Test of safety-relevant functions (emergency shutdowns)
- Documentation of the test results
- Linking via API interface with simulation tools such as SIMIT for plant simulation

Design

SIMBA Profibus comprises the following components:
- External SIMBA Profibus module with 2, 4 or 8 channels
- Configuration and diagnostics software for standard PC
- Electronic documentation in HTML format

The SIMBA Profibus module simulates the PROFIBUS message frame traffic. Depending on the number of channels, 2, 4 or 8 PROFIBUS lines each with up to 125 PROFIBUS slaves can be simulated in real-time with one module. It is also possible to network several SIMBA Profibus modules together via the Ethernet control interface. Altogether, a SIMBA project can thus comprise up to 32 PROFIBUS lines.

The configuration and diagnostics software which can be used on a standard PC with Windows 2000 or XP communicates with the SIMBA Profibus modules over the standard Ethernet network interface. The software can be used to configure the SIMBA Profibus modules and to implement simple simulation functions for equipment.

Function

SIMBApro FAT is able, with SIMBA Profibus, to completely simulate the response of I/O devices on the PROFIBUS DP fieldbus reaction-free. Additional functions for the Factory Acceptance Test (FAT) allow uniform testing of the automation architecture.

Fault statuses can be simulated in addition to normal plant operation. All diagnostic options of the PROFIBUS DP are available, ranging from missing or incorrect feedbacks up to distributed I/O faults (failure of module, station or line).

The configuration of the PROFIBUS DP and the PROFIBUS slaves can be imported from the SIMATIC PCS 7 project (HW Config).

A library with easily configurable typicals for simulation of equipment (valves, pumps, switches etc.) is delivered together with the configuration and diagnostic software, and can be expanded by users with their own library elements. Equipment feedbacks are easy to generate using the equipment typicals. This process can be automated through time-saving importing of a STEP 7/PCS 7 symbol table.

Simulation requirements extending beyond the scope of the Factory Acceptance Test, e.g. complete process simulations, can be implemented with SIMIT. SIMIT can read and write the data of SIMBApro FAT via an API interface.

Technical specifications
- Baud rate of PROFIBUS DP: max. 12 Mbit/s
- SIMBA Profibus modules with channels for 2, 4 or 8 PROFIBUS DP lines
- Up to 125 PROFIBUS slaves can be simulated per PROFIBUS line
- Maximum configuration with 8-channel SIMBA Profibus module:
  - Up to 8 single or 4 redundant PROFIBUS DP lines
  - Up to 8 x 125 PROFIBUS slaves
- Up to 32 PROFIBUS lines per SIMBA project
- PROFIBUS slaves which can be simulated: standard slaves and S7 slaves, also safety-related and redundant
- Simple expansion with new PROFIBUS slaves
- S7-specific PROFIBUS functions
- Asynchronous PROFIBUS services
- Process and diagnostics alarms can be triggered
- Library for standard typicals
- Generation of own simulation functions (typicals)
- Import functions (HW-Config, symbol table)
- Definition of import filters
### SIMBApro FAT: Fieldbus simulation with Factory Acceptance Test

**Selection and ordering data**

<table>
<thead>
<tr>
<th>SIMBA Profibus</th>
<th>Order No.</th>
<th>24 V DC plug-in power supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-channel for 2 PROFIBUS lines with max. 125 PROFIBUS DP slaves each</td>
<td>9AE4 122-1AA00</td>
<td>Option for supplying SIMBA PROFIBUS module with 24 V DC if a corresponding power supply is not available</td>
</tr>
<tr>
<td>4-channel for 4 PROFIBUS lines with max. 125 PROFIBUS DP slaves each</td>
<td>9AE4 122-1AB00</td>
<td>Input voltage 230 V AC, 50 Hz</td>
</tr>
<tr>
<td>8-channel for 8 PROFIBUS lines with max. 125 PROFIBUS DP slaves each</td>
<td>9AE4 122-1AC00</td>
<td>Output voltage 24 V DC, 2.5 A</td>
</tr>
</tbody>
</table>

Type of delivery:
Software and electronic documentation on CD, certificate of license, module

**Services for every aspect of simulation**
- Support and consulting
- Selection of simulation tools
- Strategy for implementing the simulation
- Creation of simulation solutions at fixed price

On request

---

**More information**

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www.siemens.com/Simba
SIMIT: Simulation-based engineering

Overview

SIMIT is a powerful simulation platform which is integrated into the SIMATIC PCS 7 engineering by means of open interfaces, but which remains open for functional expansions as a result of its modular design. You do not need to be a specialist to generate and apply simulations with SIMIT. It is merely necessary to use SIMIT’s graphic user interface – all mathematical and IT procedures of a simulation are carried out by SIMIT in the background.

As a platform for virtual commissioning of SIMATIC user software, SIMIT provides a wide range of performance. For example, SIMIT can be automatically configured for signal tests, or it can be used to simulate processes and complete plants of any complexity in real-time. SIMIT provides the appropriate simulation environment, from simple key-triggered PLC signal tests, testing of the drive level, physical simulation of the process response for a complete plant test, all the way to operator training.

SIMIT is designed such that its functionality and scope can be specifically adapted to individual requirements. The basic system already provides powerful simulation functions. Hardware and software modules can be used to specifically expand the SIMIT functionalities.

Simulation is supported by appropriate automated functions. For example, importing of a symbol table or a list of signal names is sufficient for automatic configuration of the signal links. If the Import/Export Assistant (IEA) is used in SIMATIC PCS 7 projects, the IEA data can be used in SIMIT for automatic establishment of a simulation environment. The standard patterns suitable for SIMATIC PCS 7 are already included in SIMIT.

Note:
SIMIT can be used together with SIMATIC PCS 7 V6 and V7.

Function

A simulation is produced with SIMIT simply by "combining" individual components on a GUI. The predefined components are selected from a library, connected together, and parameterized.

Engineering on the PC with SIMIT

The SIMATIC user program generated in SIMATIC PCS 7 is loaded into the PLC simulation S7-PLCSIM, and receives the simulated I/O signals from SIMIT via the PLCSIM coupling. The interface is configured automatically in SIMIT by importing the symbol table from SIMATIC PCS 7. SIMIT can also generate the corresponding simulation environment automatically using the PCS 7 Import/Export Assistant (IEA). Simulation examples matched to example automation solutions are used for this. The complete interaction between automation and process (model) is completed by means of a process model.

If the SIMATIC PCS 7 operator station is coupled to PLCSIM, the complete automation function from the sensor to the automation and visualization systems and back again to the actuator can already be tested on the SIMATIC PCS 7 engineering system in the technical office without the actual existence of the automation hardware.

Factory Acceptance Test (FAT) of the overall plant with SIMIT

The Factory Acceptance Test (FAT) tests the complete automation functions. The actual automation systems (SIMATIC S7 controller) are loaded with the SIMATIC user software. SIMIT then simulates the input/output signals, instrumentation and field devices. The simulation values are transmitted as PROFIBUS DP telegrams to the individual automation systems via the SIMIT interface modules (IM-1, IM-2). The link between SIMIT and the automation level is carried out automatically by the SIMATIC PCS 7 hardware configuration. As already described for engineering on the PC, the IEA mechanisms can also be used to automatically generate the test environment. If SIMIT handles the process simulation in addition, the FAT then becomes a plant test. Commissioning of the automation functions can already be carried out in the virtual process in an early phase of the project.
**Training simulation with SIMIT**

In conjunction with SIMATIC PCS 7 and S7-PLCSIM, SIMIT forms the simulation platform for a training system. Plant operators can then be trained even before the real plant is fully functional.

The simulation models used provide a realistic plant response under various operating conditions (e.g. start-up and shutdown, safety-related shut-down, etc.). If necessary, special simulators can also be linked to SIMIT via the standardized OPC client/server coupling.

**Additional features**

Apart from the standard library, FlowNet provides a comprehensive library for simulation of media flows in pipeline networks. Individual library components or macro components can be created using editors. SIMIT’s scope of performance is rounded-off by animated, user-configured graphics as well as trend windows for visualization of simulation values.
### Ordering data

<table>
<thead>
<tr>
<th>Software Module</th>
<th>Description</th>
<th>Order No.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLCSIM coupling V5.4</strong></td>
<td>Software module for linking SIMIT to S7-PLCSIM. Can only be used in conjunction with S7-PLCSIM Version 5.2 or higher.</td>
<td>9AP1 433-2AA10</td>
<td>9AP1 441-2AA10</td>
</tr>
<tr>
<td><strong>PROFIBUS DP coupling V5.4</strong></td>
<td>Software module for linking SIMIT to the PROFIBUS DP of SIMATIC S7 PLCs. Can only be used for and in conjunction with SIMIT interface modules 9AP2 423-2AA10 and 9AP2 424-2AA10!</td>
<td>9AP1 434-2AA10</td>
<td>9AP1 442-2AA10</td>
</tr>
<tr>
<td><strong>SIMIT expansions</strong></td>
<td><strong>ACI V5.4</strong></td>
<td>Auto Control Interface, SIMIT expansion module for generation and implementation of automated simulation procedures.</td>
<td>9AP1 436-2AA10</td>
</tr>
<tr>
<td><strong>MCE V5.4</strong></td>
<td>Macro Component Editor, SIMIT expansion module for generation of macros from standard library elements.</td>
<td>9AP1 440-2AA10</td>
<td>9AP1 444-2AA10</td>
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<tr>
<td><strong>DGE V5.4</strong></td>
<td>Dynamic Graphics Editor, SIMIT expansion module for graphic processing of model charts and operating screens; animated graphics.</td>
<td>D: Subject to export regulations AL: N and ECCN: 5D992</td>
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</tr>
<tr>
<td><strong>TME V5.4</strong></td>
<td>Trend &amp; Message Editor, SIMIT expansion module for graphic display of signal trends and messages.</td>
<td>9AP1 443-2AA10</td>
<td></td>
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<tr>
<td><strong>SMD V5.4</strong></td>
<td>Structured Model Diagrams, SIMIT expansion module for generation of models from templates and tables (PCS 7 Import/Export Assistant).</td>
<td>9AP1 444-2AA10</td>
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<tr>
<td>Ordering data</td>
<td>Order No.</td>
<td>Order No.</td>
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<tr>
<td><strong>SIMIT library</strong></td>
<td>9AP1 450-2AA10</td>
<td><strong>SIMIT Interface modules</strong></td>
<td></td>
</tr>
<tr>
<td><strong>FlowNet V5.4</strong></td>
<td></td>
<td><strong>IM-1</strong></td>
<td></td>
</tr>
<tr>
<td>SIMIT library for modeling media flows in pipeline networks using flow networks; contains process engineering components for modeling such as equipment, tanks, pumps, pipes, etc. Electronic documentation, 2 languages (German, English), is part of the SIMIT Basic product Engineering software, software class A, 2 languages (German, English), single license for 1 installation Type of delivery: Certificate of license, license key on diskette</td>
<td></td>
<td>Interface module for SIMIT for simulation of PROFIBUS DP slaves: single-channel PCI plug-in card for simulation of one DP segment with max. 125 DP slaves; same design as SIMBApro PCI Can only be used with PROFIBUS DP coupling module 9AP1 434-2AA10.</td>
<td></td>
</tr>
<tr>
<td><strong>Documentation</strong></td>
<td></td>
<td><strong>IM-2</strong></td>
<td></td>
</tr>
<tr>
<td>Complete SIMIT documentation in electronic form (PDF files) on CD is part of the SIMIT Basic product.</td>
<td></td>
<td>Interface module for SIMIT for simulation of PROFIBUS DP slaves: two-channel PCI plug-in card for simulation of two DP segments with max. 125 DP slaves each; same design as SIMBApro PCI Can only be used with PROFIBUS DP coupling module 9AP1 434-2AA10.</td>
<td></td>
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<tr>
<td><strong>Service</strong></td>
<td>9AP1 471-2AD00</td>
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<tr>
<td><strong>SIMIT consulting</strong></td>
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<tr>
<td>Consulting on a daily basis, customer-specific training Type of delivery: Written contract</td>
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<tr>
<td>D: Subject to export regulations AL: N and ECCN: 5D992</td>
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</tbody>
</table>

**More information**

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## Diagnostics

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/2</td>
<td>BANY: Bus analysis for SIMATIC Ethernet and PROFIBUS networks</td>
</tr>
<tr>
<td>9/4</td>
<td>Amprolyzer: Bus monitor for PROFIBUS diagnostics</td>
</tr>
<tr>
<td>9/5</td>
<td>System diagnostics via PROFIBUS</td>
</tr>
<tr>
<td>9/7</td>
<td>ibaPDA/ibaAnalyzer: Fault tracking log - recording and analysis</td>
</tr>
<tr>
<td>9/9</td>
<td>PM-MAINT: Flexible maintenance management for SIMATIC PCS 7</td>
</tr>
</tbody>
</table>
BANY: Bus analysis for SIMATIC Ethernet and PROFIBUS networks

Overview

BANY is a tool based on Microsoft Windows for the documentation, diagnostics, recording and analysis of your SIMATIC S7/PCS 7 Ethernet and PROFIBUS networks. The functionality for the analysis, diagnostics, and documentation of the Ethernet and PROFIBUS networks is shared between two independent program packages, which are offered both individually and as a bundle.

Note:
BANY can be used together with SIMATIC PCS 7 V6 and V7.

Design

BANYnet Ethernet

• The plant manager from BANYnet Ethernet offers your valuable help in configuring your plant with the management of IP and MAC addresses, automatic generation of the plant display, as well as import and export functions.
• The plant diagnosis reads the configuration data and extensive message frame type and fault statistics from the SNMP-compatible network components and provides you with information for searching for faults in the Ethernet network. Data such as bus load or lifelist is evaluated and displayed online.
• The bus analysis records the message traffic synchronously by means of one or more Ethernet buses and interprets the messages across all levels, including SIMATIC S7/PCS 7. Extensive trigger, filter and sort functions enable faults to be quickly located.

BANY PROFIBUS

• The bus diagnosis provides you with information required to search for faults in PROFIBUS networks. Data such as bus load or lifelist is evaluated and displayed online.
• The bus analysis records the message traffic synchronously by means of one or more PROFIBUSES and interprets the messages across all levels, including SIMATIC S7/PCS 7. Extensive trigger, filter and sort functions enable faults to be quickly located.

Function

BANYnet Ethernet

The plant manager is used for configuring the plant structure. All information is stored in data structures. An import/export function enables data to be exchanged with other programs. A helpful plant overview is automatically generated from the data structures. This means the plant manager can be used both for documentation and configuration of Ethernet networks. Tables provide detailed information about the properties of the bus nodes. For documentation purposes, any information can be assigned to the individual bus nodes.

The plant diagnosis queries system data of SNMP-compatible network nodes (e.g. switches, PCs) and provides the user with information about the configured nodes. The bus load indicators of the individual ports (numeric or graphic) and the node list offer excellent assistance in locating faults in the Ethernet network.

Statistics functions provide information about the number of individual message types (packet lengths, message types, types of error etc.). The events sent by the switch (traps) can be displayed in a list.

In addition, the parameter setting of OSM/ESM is supported, e.g. IP address, port configuration or firmware update.

The bus analysis with the integral BANYmon permits convenient analysis of recorded files (import/export of Netmon or sniffer files also possible). Faults can be quickly located and confined using predefined or self-generated filter and sorting functions. When you click on a listed message, the associated detailed information is displayed. SIMATIC S7/PCS 7-specific messages are interpreted and displayed according to their type (e.g. redundancy messages, Alarm-8 messages etc.).
Function (continued)

BANY PROFIBUS

The bus diagnosis supplies special information about the bus and the associated bus nodes. Using a lifelist it is possible at any time to check which nodes are connected to the bus and which of those is a master or slave. The bus load measurement provides information on bus bottlenecks and available reserves. The recorded messages are interpreted according to their type (e.g. DP, FDL, DPV1 or DPV2) and processed into statistics.

The bus analysis permits the recording, backup and convenient analysis of bus events. It supports all baud rates from 9.6 kbaud through 12 Mbaud and determines these automatically. The data can be recorded in a linear buffer or a cyclic buffer of any size. In this way, long-term archiving is possible. The start and end of the recording can be automated with the aid of triggers. Using predefined or self-generated filter and sorting functions, the quantities of data accumulated during recording can be reduced and errors in the subsequent analysis can easily be limited. When you click on a listed message, its detailed information is displayed. The interpretation and display of SIMATIC S7/PCS 7-specific messages depends on their type (e.g. redundancy messages, Alarm-8 messages etc.). The following protocols are interpreted: DP, FDL, DPV1, DPV2, FMS and S7.

The BANY property of performing several recordings in parallel can be used for the redundancy analysis. For this purpose, BANY PROFIBUS is connected to the redundant bus lines. Since the recorded messages are assigned synchronous time stamps, the flow of communication can be compared easily. This permits fast and accurate localization of redundancy problems.

Note:
The computer with the BANY PROFIBUS program package requires a CP 5512 (PC-Card) communications processor for the PROFIBUS interface.

Selection and ordering data

| BANYnet Ethernet Bus analysis and diagnostics for SIMATIC Ethernet networks Program package for PC/PG, 2 languages (German, English), executes with Microsoft Windows NT/2000/XP Engineering and runtime software, software class A Type of delivery: Software and electronic documentation on CD as well as license key dongle • Software protection by means of parallel/serial dongle • Software protection by means of USB dongle | Order No. 9AE4 100-1DA00 9AE4 100-1DB00 |
| BANYnet – Bus analysis and diagnostics for Ethernet and PROFIBUS networks Program package for PC/PG, 2 languages (German, English), executes with Microsoft Windows 2000/XP Engineering and runtime software, software class A Type of delivery: Software and electronic documentation on CD as well as license key dongle • Software protection by means of parallel/serial dongle • Software protection by means of USB dongle | Order No. On request 9AE4 100-1DE00 |
| Network planning, plant analysis/diagnostics on site and BANY training CP 5512 communications processor for the PC/PG connection to PROFIBUS or MPI 32-bit PC card (CardBus) with bus adapter for PROFIBUS Type of delivery: PC card, bus adapter and product information | Order No. On request 6GK1 551-2AA00 |

More information

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**Overview**

The bus monitor Amprolyzer V3.2 (Advanced Multicard PROFIBUS Analyzer) offers powerful software for PROFIBUS diagnostics, which is recommended for commissioning and service engineers in particular.

**Note:**
The Amprolyzer V3.2 can be used for PROFIBUS diagnostics in plants with SIMATIC PCS 7 V6 and V7.

**Function**

**Essential functions of Amprolyzer V3.2**
- Message frame recording with trigger and filter options relating to events and message frame contents, including time stamp
- Storing and exporting message frame recordings in Excel format
- Lifelist with all stations on the PROFIBUS
- Overview diagnostics with the current operating states of the nodes
- Bus statistics with the number of events, e.g. timeouts or message frame repeats
- Automatic detection of the transmission rate

**System requirements for Amprolyzer V3.2**
- 10 MB available hard disk memory
- Microsoft Windows 2000 (SP2 and higher) / Windows XP Professional operating system (administrator rights required)
- Microsoft Excel 2000/XP/2003
- CP 5611 communication module (PCI)
  Note: SIMATIC Field PG, Power PG, PG 720 and PG 740 use the CP 5611 as an integrated PROFIBUS interface

The Amprolyzer does not require installation of STEP 7. However, STEP 7 and Amprolyzer can be installed on the same computer.

**More information**

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http://support.automation.siemens.com/WW/view/de/18818699
Overview

The operator in the control center requires not only extensive information about the automated process, but also information about the status of the instrumentation and control technology. With the SIMATIC PCS 7 add-on for status display and diagnostics of PROFIBUS DP/PA slaves (redundant/non-redundant), the essential properties of the PROFIBUS DP/PA devices can be diagnosed and displayed on an operator station.

PROFIBUS masters are SIMATIC PCS 7 automation systems of the SIMATIC S7-400 range, both standard systems and fault-tolerant or safety-related systems.

All functions are provided by an AS block and an ActiveX control (faceplate). The AS block records the information of the configured master system and sends the data to the operator system.

The faceplate displays the PROFIBUS DP line configured using the SIMATIC PCS 7 engineering system (AS-Engineering) including all PROFIBUS DP stations in an overview display. There the following detailed views can be called up:

- Overview and status display of connected PROFIBUS PA slaves
- Overview of the devices on a Y link
- DP standard diagnostics information of all PROFIBUS DP slaves
- Configuration data from AS-Engineering (e.g. Order No., function or location designation)
- Topology display (possible when using a diagnostics repeater)

The data required to configure the PROFIBUS DP/PA overview display and the diagnostics information is derived from the hardware configuration (automation systems, bus components, process I/O) of the SIMATIC PCS 7 project. Additional configuration overhead or engineering know-how are unnecessary. After the initial configuration, the engineering environment is no longer required.

Note:
The SIMATIC PCS 7 add-on products for system diagnostics via PROFIBUS can be used together with SIMATIC PCS 7 V6 and V7.

Benefits

- Online diagnostics is independent of any engineering tools
- All PROFIBUS DP/PA slaves known in the SIMATIC PCS 7 engineering system can be visualized
- All relevant information concerning configured PROFIBUS slaves is available rapidly and reliably
- Diagnosing of diagnostics repeaters and the slaves behind them
- Only a few, simple configuration steps
- Application of the configuration data created as standard during configuration with the SIMATIC PCS 7 Engineering System (export of hardware configuration)
- Simple tracking of changes in the hardware configuration - online and at all times
- New PROFIBUS DP devices can be imported by users themselves
- Users can change the diagnostics texts and colors at any time in the ActiveX object
- Diagnostic buffer for saving error messages

Function

**PROFIBUS DP/PA slave diagnostics**

The current operating states of the configured PROFIBUS DP slaves can be displayed by means of the faceplate and any fault states that have arisen can be evaluated. Depending on the desired scope of the diagnostics functionality, up to four STEP 7 blocks can be connected in series with the central AS block on the controller side. The STEP 7 blocks record different information of the configured master system, and send this via the central AS block to the operator system.

In a detailed view you can see important information about one PROFIBUS DP slave, e.g.:

- Station failure
- Overview of the connected PROFIBUS PA master systems
- Overview of the devices on a Y link
- Detailed diagnostic information on the PROFIBUS DP slaves, including:
  - Module status
  - Detailed diagnostics
  - Channel diagnostics
  - Order No.
  - Function or location designation
- Display of the "Description" and "Comments" fields from the hardware configuration
- Order No., station address, slot location, module type

All PROFIBUS DP standard slaves known in the SIMATIC PCS 7 engineering system can be implemented.
Diagnostics

System diagnostics via PROFIBUS

Function (continued)

**Integral redundancy functions**

Using the PROFIBUS DP/PA slave diagnostics, redundant PROFIBUS DP master systems can also be monitored, and failures detected and visualized. In the case of redundant PROFIBUS DP slaves, information is also displayed indicating when a communication path is defective.

In addition to the diagnostics information listed above, the detailed view of the PROFIBUS DP slave also supplies information on the redundancy of the modules.

**S7-400 CPU diagnostics**

As central I&C components, the CPUs of the SIMATIC PCS 7 automation systems are particularly important. Using the S7-400 CPU diagnostics it is possible to diagnose the most important CPU properties for both the standard S7-400 CPUs and the fault-tolerant S7-400H CPUs. The current CPU status can be displayed on LEDs.

**System requirements**

The SIMATIC PCS 7 system requirements apply analogous to SIMATIC PCS 7 V6.0, V6.1, V7.0 or V7.1.

**Licensing**

A license is required for each operator station on which the faceplate is used. It is irrelevant whether the operator station is operated as a single station or client.

From each operator station, any number of PROFIBUS DP master systems (each with up to 125 slave nodes) can be visualized and evaluated.

---

**Selection and ordering data**

<table>
<thead>
<tr>
<th>System diagnostics for PROFIBUS DP/PA slaves</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software and electronic documentation, 2 languages (German, English); additional languages can be configured by the user</td>
<td>J 2XV9 450-1SD12</td>
</tr>
<tr>
<td>Engineering and runtime software, software class A, single license for 1 installation</td>
<td></td>
</tr>
<tr>
<td>Type of delivery: Software on CD and license on diskette</td>
<td></td>
</tr>
<tr>
<td>Can be used for SIMATIC PCS 7 V6.0, V6.1, V7.0 and V7.1 in accordance with the system requirements of SIMATIC PCS 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System diagnostics for S7-400 CPUs</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software and electronic documentation, 2 languages (German, English); additional languages can be configured by the user</td>
<td>J 2XV9 450-1SD08</td>
</tr>
<tr>
<td>Engineering and runtime software, software class A, single license for 1 installation</td>
<td></td>
</tr>
<tr>
<td>Type of delivery: Software on CD and license on diskette</td>
<td></td>
</tr>
<tr>
<td>Can be used for SIMATIC PCS 7 V6.0, V6.1, V7.0 and V7.1 in accordance with the system requirements of SIMATIC PCS 7</td>
<td></td>
</tr>
</tbody>
</table>

J: Subject to export regulations AL: N and ECCN: EAR99S

---

**More information**

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Industry Sector
Industry Solutions Division
Industrial Technologies
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Additional information is available on the Internet at:

www.siemens.com/systemdiagnostics_profibus-slaves
Whereas process control systems are generally operated with cycle times of between 50 ms and 4 s, faults can come and go at a considerably faster rate so that they are not detected within these CPU cycles. In addition, some faults only occur very sporadically. Systems such as ibaPDA and ibaAnalyzer for recording and analyzing fault sequence logs offer valuable support in tracing such faults.

ibaPDA is a program package for recording fault sequence logs on a separate recording computer (PC) which is either connected to the PROFIBUS DP using a special PCI card from iba or communicates online with the automation system’s CPU by means of the ibaPDA-interface-S7-Analyzer via MPI, CP/IP or Ethernet TCP/IP. By means of a recording computer, up to 2000 measured signals (digital and/or analog) can be recorded at a rate of up to 1 ms. Using ibaPDA-Request-S7, the measured data from the recording computer can be accessed and selected online without having to shut down the automation system’s CPU.

The signals recorded centrally with ibaPDA are stored in files and can be analyzed or visualized online from any number of workstations using the free ibaAnalyzer program package.

The supplementary ibaAnalyzerDB package permits the convenient further processing of the recorded data with database support. Recorded data can be written to various databases (e.g. Microsoft SQL Server, Microsoft Access, Oracle) and read out again according to selectable query criteria.

Note:
ibaPDA and ibaAnalyzer can be used together with SIMATIC PCS 7 V6 and V7.
Function (continued)

**S7 Direct Access**
- Connection of the recording system by means of PC card as PROFIBUS DP standard slave
- Optional online access to almost all operands of the S7-400
- Exact cyclic output of measured data to the measuring system

**ibaPDA-interface-S7-Analyzer**
- Connection of recording system to automation system’s CPU via MPI, CP/PG or Ethernet TCP/IP
- Optional online access to almost all operands and symbols of the S7-400
- Output of measured data via the selected communication link (MPI, CP/PG or Ethernet TCP/IP) at processing rate of S7 system service

**Operating system platforms for all program packages**
- Windows XP
- Windows 2000
- Windows 2000 Server
- Windows Server 2003

More information
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Phone: +49 911-97282-0
Fax: +49 911-97282-33
E-mail: sales@iba-ag.com
www.iba-ag.com
PM-MAINT is a sector/technology-independent maintenance management system for inspection, servicing and maintenance of production plants, and is primarily designed for preventive, performance-dependent maintenance. With the objective of maximizing plant availability, PM-MAINT uses the performance data or calendar intervals to generate predictive planning of maintenance measures. PM-MAINT determines the optimum time with regard to production and maintenance. Inspection and maintenance carried out too early increases the maintenance costs, and delayed implementation can result in production failures with high repair and downtime costs.

PM-MAINT is linked to the automation level of the process control system via the SIMATIC PCS 7 operator system or per OPC. With its numerous import and export options, it is an ideal supplement for the SIMATIC PCS 7 Maintenance Station.

Note:
The PM-MAINT maintenance management system can be used in plants with SIMATIC PCS 7 V6 and V7.
Function

PM-MAINT permits mapping of the hierarchical plant structure of the company down to the level of the smallest units for maintenance. Maintenance jobs can be created for each maintenance object.

Maintenance planning and activation

In the case of performance-dependent maintenance, PM-MAINT utilizes operating hours and switching cycles from the current process data to calculate the recommended maintenance dates. When these dates are reached, PM-MAINT automatically activates the maintenance job. Further options for activating maintenance jobs are process events or calendar intervals (days, weeks, months, quarters, years).

Assignment of documents

Any documents can be added as supplementary information to each maintenance object or job in the object tree, e.g.
- Dimension drawings
- Technical specifications
- Maintenance information

Job recording/checklists

Maintenance jobs can be recorded manually or automatically - as individual or joint reports. These reports are then used by the maintenance personnel as a checklist. Lists with ordering data for material requirements planning are additionally available for printing depending on the job. Processing of measures can also be documented in a report.

Archiving and analysis

All maintenance activities are saved in an archive which is permanently evaluated to achieve a continuous improvement in maintenance procedures. Unexpected maintenance jobs can be recorded manually or by means of the SIMATIC PCS 7 Maintenance Station, and integrated into the long-term archiving.

Selection and ordering data

<table>
<thead>
<tr>
<th>PM-MAINT system software for SIMATIC PCS 7 V6 and V7</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM-MAINT system software Type S</td>
<td>9AE7 104-2SS10-1AA0</td>
</tr>
<tr>
<td>for a Single Station (single-user system) or a Server (multi-user system), executes with Windows 2000, Windows XP Professional and Windows 2003 Server Engineering and runtime software, software class A, 2 languages (German, English), single license for one installation Type of delivery: software and electronic documentation on CD, dongle (hard lock), and certificate of license • &quot;Compact&quot; version for up to 100 maintenance jobs • &quot;Standard&quot; version for up to 300 maintenance jobs • &quot;Professional&quot; version for more than 300 maintenance jobs</td>
<td></td>
</tr>
<tr>
<td>PM-MAINT system software Type C</td>
<td>9AE7 104-2SC00-1AA0</td>
</tr>
<tr>
<td>for a Client (multi-user system), executes with Windows 2000, Windows XP Professional and Windows 2003 Server Engineering and runtime software, software class A, 2 languages (German, English), single license for one installation Type of delivery: software and electronic documentation on CD, dongle (hard lock), and certificate of license</td>
<td></td>
</tr>
</tbody>
</table>

More information

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Fax: +49 621 456 3334
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Additional information is available on the Internet at: www.siemens.de/process-management
Laboratory automation
One feature of laboratory work is the frequent modification of experiments through which valuable knowledge, data and parameters are gained for series production. Particularly essential for automation of the laboratory - in addition to high quality, efficiency and safety - is therefore fast and flexible adaptation of the laboratory equipment to the automation technology.

With the PCS 7 LAB Collection we offer you a SIMATIC PCS 7 automation project that is explicitly tailored to these specific laboratory requirements. The matching SIMATIC PCS 7 system platform is described in detail in the configuration lists of this project.

This enables you to assemble your laboratory automation system flexibly depending on the project specifications and to have an influence on the construction and installation technology. The selected components can be ordered separately by means of the SIMATIC PCS 7 Main Catalog ST PCS 7 and supplementary SIMATIC Catalogs.

The PCS 7 LAB Collection is not only suitable for autonomous laboratory automation. The integration of the laboratory automation system into the SIMATIC PCS 7 plant network permits both an efficient exchange of information and the simple transfer of laboratory results to the production department.

Preferred field of application for the PCS 7 LAB Collection are:
- Process-engineering laboratories in the process industry (chemical and pharmaceutical industries, biotechnology, food and beverage industry)
- Training establishments (universities, technical colleges)
- Test bench automation systems
Design (continued)

System platform for PCS 7 LAB Collection

The license of the PCS 7 LAB Collection authorizes the user to download a preconfigured laboratory automation project. In addition to automation examples of typical laboratory applications, this also includes the source code for the laboratory devices supported.

Hardware and SIMATIC PCS 7 system software for automation, engineering, operator control and monitoring can be ordered individually using the following configuration lists, the main SIMATIC PCS 7 Catalog ST PCS 7, and the supplementary SIMATIC Catalogs, e.g. ST 70, ST 80 or IK PI.

The hardware and software components described in the configuration lists of the PCS 7 LAB Collection are categorized as follows:

- System for automation, engineering, operator control and monitoring, alternatives:
  - All-in-one system with the SIMATIC PCS 7 functionality for operator control and monitoring (OS), engineering (ES) and automation (AS) in one device:
    SIMATIC PCS 7 BOX RTX compact system with SIMATIC PCS 7 AS/OS Engineering Software V7.1+SP2, suitable for OS productive operation,
  - Distributed system in which the AS functionality is exported to an external SIMATIC PCS 7 automation system:
    SIMATIC PCS 7 AS RTX and SIMATIC PCS 7 ES/OS systems (e.g. SIMATIC PCS 7 BOX ES/OS System) with SIMATIC PCS 7 AS/OS Engineering Software V7.1+SP2, suitable for OS productive operation
- Distributed I/O for connection of laboratory devices, alternatives based on:
  - ET 200pro or
  - ET 200S
- Components for serial connection of third-party devices, alternatives based on:
  - ET 200M or
  - ET 200S

Configuration list for SIMATIC PCS 7 BOX RTX ES/OS complete system

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6ES7 650-4AA00-...</td>
<td>SIMATIC PCS 7 BOX RTX ES/OS system (WinAC RTX 2010)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intel Core i7-610E processor (2 cores/4 threads), 2.53 GHz, TB, HT, VT, 4-MB cache; main memory 2 GB, DDR3 1066, DIMM; hard disk 250 GB HDD SATA; DVD+RW; 2 x 10/100/1000 Mbit/s Ethernet RJ45; graphics onboard, 4 x USB V2.0 (high current); 1 x serial (COM1); 1 x PCI, 1 x PCIe (X16); PROFIBUS DP onboard (CP 5611-compatible); Windows XP Professional, MUI (Ge, En, Fr, It, Sp, ZH); SIMATIC PCS 7 software version V7.1+SP2</td>
</tr>
<tr>
<td></td>
<td>-0A•</td>
<td>Without panel</td>
</tr>
<tr>
<td></td>
<td>-0AB•</td>
<td>19&quot; TFT Touch Panel, 1280x1024 pixels</td>
</tr>
<tr>
<td></td>
<td>-0A0</td>
<td>110/230 V AC industrial power supply to NAMUR; European power cable</td>
</tr>
<tr>
<td></td>
<td>-0A•1</td>
<td>110/230 V AC industrial power supply to NAMUR; power cable for Great Britain</td>
</tr>
<tr>
<td></td>
<td>-0A•2</td>
<td>110/230 V AC industrial power supply to NAMUR; power cable for Switzerland</td>
</tr>
<tr>
<td></td>
<td>-0A•3</td>
<td>110/230 V AC industrial power supply to NAMUR; power cable for USA</td>
</tr>
<tr>
<td></td>
<td>-0A•4</td>
<td>110/230 V AC industrial power supply to NAMUR; power cable for Italy</td>
</tr>
<tr>
<td></td>
<td>-0A•5</td>
<td>110/230 V AC industrial power supply to NAMUR; power cable for China</td>
</tr>
<tr>
<td></td>
<td>-0A•6</td>
<td>24 V DC industrial power supply</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 652-0XD17-2YB5</td>
<td>SIMATIC PCS 7 SFC Visualization V7.1 for display and operation of SFC sequence controls on an operator station; 6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows XP Professional or Windows Server 2003, floating license for 1 user</td>
</tr>
</tbody>
</table>

Optional accessories

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6ES7 648-0CB00-0YA0</td>
<td>SIMATIC PC keyboard (USB connection); with international key assignment</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 790-0AA01-0XA0</td>
<td>SIMATIC PC mouse (optical, 3-button) for programming device and PC; with adapter</td>
</tr>
<tr>
<td>1</td>
<td>6GF6 220-1DA01</td>
<td>SCD 19101-D industrial LCD monitor</td>
</tr>
</tbody>
</table>

Further accessories:
Possible additional accessories (to be provided by customer):
- PROFIBUS cable
**Design (continued)**

### Configuration list for combination of SIMATIC PCS 7 ES/OS system and SIMATIC PCS 7 AS RTX

#### Example 1: SIMATIC PCS 7 BOX ES/OS system and SIMATIC PCS 7 AS RTX

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6ES7 650-4AA00-....</td>
<td>SIMATIC PCS 7 BOX ES/OS system Intel Core i7-610E processor (2 cores/4 threads), 2.53 GHz, TB, HT, VT, 4 MB cache); main memory 2 GB, DDR3 1066, DIMM; hard disk 250 GB HDD SATA; DVD+RW; 2 x 10/100/1000 Mbit/s Ethernet RJ45; graphics onboard, 4 x USB V2.0 (high current); 1 x serial (COM1); 1 x PCI, 1 x PCIe (X16); PROFIBUS DP onboard (CP 5611-compatible); Windows XP Professional, MUI (Ge, En, Fr, It, Sp, Zh); SIMATIC PCS 7 software version V7.1+SP2 Note: SIMATIC PCS 7 AS/OS Engineering Software (250 POs), 5 languages (German, English, French, Italian, Spanish), inclusive</td>
</tr>
</tbody>
</table>

- **-0CA** Without panel
- **-0CB** 19" TFT Touch Panel, 1280x1024 pixels
- **-0C0** 110/230 V AC industrial power supply to NAMUR; European power cable
- **-0C1** 110/230 V AC industrial power supply to NAMUR; power cable for Great Britain
- **-0C2** 110/230 V AC industrial power supply to NAMUR; power cable for Switzerland
- **-0C3** 110/230 V AC industrial power supply to NAMUR; power cable for USA
- **-0C4** 110/230 V AC industrial power supply to NAMUR; power cable for Italy
- **-0C5** 110/230 V AC industrial power supply to NAMUR; power cable for China
- **-0C6** 24 V DC industrial power supply

#### Example 2: Other SIMATIC PCS 7 ES/OS system and SIMATIC PCS 7 AS RTX

If the SIMATIC PCS 7 AS RTX is not combined with a SIMATIC PCS 7 BOX ES/OS system but with a different SIMATIC PCS 7 ES/OS system, the SIMATIC PCS 7 AS/OS Engineering Software (250 POs) is not part of the scope of delivery, and must be ordered separately. The above configuration list is then changed as follows:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6ES7 654-0UE13-0XX0</td>
<td>SIMATIC PCS 7 AS RTX Assembled and preinstalled automation system on the basis of the SIMATIC IPC427C with Windows XP Embedded Standard 2009 operating system, WinAC RTX 2010 controller software and SIMATIC PC DiagMonitor diagnostics software, pre-installed on a 4 GB CompactFlash Card, can be used with SIMATIC PCS 7 V7.1+SP2 or higher</td>
</tr>
</tbody>
</table>

#### Optional accessories

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6ES7 658-5AA17-0YA5</td>
<td>SIMATIC PCS 7 Engineering Software V7.1 250 AS/OS engineering and runtime POs, 5 languages (German, English, French, Italian, Spanish), software class A, executes with Windows XP Professional or Windows Server 2003, floating license for 1 user</td>
</tr>
</tbody>
</table>

Type of delivery: License key memory stick, certificate of license including terms and conditions

**Further accessories:**

- **Possible additional accessories (to be provided by customer):**
  - PROFIBUS cable
### Configuration list for ET 200pro I/O system

#### Arrangement of the ET 200pro modules to match the configuration

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6ES7 141-4BF00-0AB0</td>
<td>Digital input module 8 DI for ET 200pro High Feature, 24 V DC, with module diagnostics; including bus module</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 142-4BD00-0AB0</td>
<td>Digital output module 4 DO for ET 200pro High Feature, 24 V DC, 2 A, with module diagnostics; including bus module</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 144-4FF00-0AB0</td>
<td>Analog input module 4 AI U for ET 200pro High Feature, ± 10 V; ± 5 V; 0 ... 10 V; 1 ... 5 V, with channel diagnostics; including bus module</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 144-4GF00-0AB0</td>
<td>Analog input module 4 AI I for ET 200pro High Feature, ± 20 mA; 0 ... 20 mA; 4 ... 20 mA, with channel diagnostics; including bus module</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 144-4JF00-0AB0</td>
<td>Analog input module 4 AI RTD for ET 200pro High Feature, resistors: 150, 300, 600 and 3000 Ω; resistance thermometers: Pt100, 200, 500, 1000; Ni100, 120, 200, 500 and 1000; with channel-discrete diagnostics, incl. bus module</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 145-4FF00-0AB0</td>
<td>Analog output module 4 AO U for ET 200pro High Feature, ± 10 V; 0 ... 10 V; 1 ... 5 V, channel diagnostics; including bus module</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 145-4GF00-0AB0</td>
<td>Analog output module 4 AO I for ET 200pro High Feature, ± 20 mA; 0 ... 20 mA; 4 ... 20 mA, channel diagnostics; including bus module</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 154-2AA00-0AB0</td>
<td>Interface module IM 154-2 for ET 200pro High Feature; including terminating module</td>
</tr>
<tr>
<td>6</td>
<td>6ES7 194-4CA00-0AA0</td>
<td>Interface module CM IO 4 x M12 4 x M12 sockets for connection of digital/analog sensors or actuators to ET 200pro</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 194-4CB00-0AA0</td>
<td>Interface module CM IO 8 x M12 8 x M12 sockets for connection of digital sensors or actuators to ET 200pro</td>
</tr>
<tr>
<td>1</td>
<td>6ES7 194-4GA00-0AA0</td>
<td>ET 200pro module rack, narrow for interface, electronics and power modules; 500 mm</td>
</tr>
</tbody>
</table>

#### Optional accessories

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6EP1 336-3BA00</td>
<td>SITOP modular 20 Stabilized power supply; input: 120/230 V AC, output: 24 V DC/20 A</td>
</tr>
</tbody>
</table>
## Design (continued)

### Configuration list for ET 200S I/O system

#### Additional accessories

Possible additional accessories (to be provided by customer):
- Cable material for connection of 120/230 AC supply
- Cable material for 24 V DC supply
- PROFIBUS cable

#### Arrangement of the ET 200S modules to match the configuration

### Quantity | Order No. | Designation |
--- | --- | --- |
1 | 6ES7 131-4BD01-0AB0 | DI 4 x DC 24 V, High Feature; digital input module for ET 200S with diagnosis; short-circuit monitoring; ordering unit: 5 units |
1 | 6ES7 132-4BB31-0AB0 | DO 2 x DC 24 V/2 A, High Feature; digital output module for ET 200S with diagnostics; channel-based switching of substitute value on failure of CPU (parameterizable), channel-based short-circuit monitoring, channel-based wire-break monitoring (on "1" signal); Ordering unit: 5 units |
2 | 6ES7 134-4FB01-0AB0 | AI 2 x (±5 V, 1...5 V, ±10 V)/13 bit, standard analog input module for ET 200S; module-internal diagnostics, overflow/underflow diagnostics |
2 | 6ES7 134-4GB01-0AB0 | AI 2 x I, 2-wire MU (4...20 mA)/13 bit, standard analog input module for ET 200S; module-internal diagnostics, overflow/underflow diagnostics, wire-break monitoring |
2 | 6ES7 134-4GB11-0AB0 | AI 2 x I, 4-wire MU (±20 mA, 4...20 mA)/13 bit, standard analog input module for ET 200S; module-internal diagnostics, overflow/underflow diagnostics, wire-break monitoring |
1 | 6ES7 134-4JB51-0AB0 | AI 2/4 x RTD standard for resistance thermometers or resistance measurement Analog input module for ET 200S • 2 inputs (3-wire and 4-wire connection) / 4 inputs (2-wire connection) • Max. resolution 15 bits + sign • Resistance thermometer Pt100, Ni100 • Module diagnostics: Overflow/underflow, internal fault, parameterization error • Channel-based wire-break monitoring |
2 | 6ES7 135-4LB02-0AB0 | AO 2 x U (1...5 V, ±10 V)/15 bit, high feature analog output module for ET 200S • Diagnostics inside module • Parameterizable connection of substitute value in case of CPU stop • Short-circuit monitoring |
2 | 6ES7 135-4MB02-0AB0 | AO 2 x I (±20 mA, 4...20 mA)/15 bit, high feature analog output module for ET 200S • Diagnostics inside module • Parameterizable connection of substitute value in case of CPU stop • Short-circuit monitoring |
1 | 6ES5 710-8MA11 | SIMATIC S5, 35 mm DIN rail, length 483 mm for 19” cabinets |
5 | 6ES7 193-4CA40-0AA0 | Terminal module TM-EE15SS26-A1, 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw terminals; ordering unit: 5 units |
2 | 6ES7 138-4CA01-0AA0 | PM-E power module; 24 V DC/10 A • Monitoring of the load voltage |
2 | 6ES7 193-4CC20-0AA0 | Terminal module TM-P15SS23-A1 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw terminals; ordering unit: 1 unit |
1 | 6ES7 151-1BA02-0AB0 | Interface module IM 151-1 for ET 200S, High Feature |

### Optional accessories

### Quantity | Order No. | Designation |
--- | --- | --- |
1 | 6EP1 336-3BA00 | SITOP modular 20 Stabilized power supply; input: 120/230 V AC, output: 24 V DC/20 A |
### Design (continued)

#### Configuration list for components for serial connection of third-party devices

Serially communicating devices are connected by means of CP 341 communication modules to the laboratory automation system. A block library for addressing the devices is supplied with the PCS 7 LAB Collection.

#### Configuration list for ET 200S components for serial connection of third-party devices

The PCS 7 LAB Collection also supports the connection of devices communicating in serial mode via ET 200S interface modules 1SI. A block library for addressing the devices is supplied with the PCS 7 LAB Collection.

### Installation

Setup and installation depend on the space available and the requirements of the operating environment in the laboratory. According to the construction guidelines of the SIMATIC PCS 7 process control system, the products defined by means of the configuration lists are suitable not only for wall mounting, but also for mounting in enclosures or cabinets.

This enables you to be very flexible in planning the construction. Both centralized and distributed structure versions can be implemented.

### Selection and ordering data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6ES7 341-1AH02-0AE0</td>
<td>CP 341 communication module with 1 x RS 232C (V.24) interface</td>
</tr>
<tr>
<td>6ES7 153-2BA02-0XB0</td>
<td>IM 153-2 High Feature slave interface for the ET 200M connection to PROFIBUS DP</td>
</tr>
<tr>
<td>6ES7 390-1AE80-0AA0</td>
<td>Standard rails (without “hot swapping” function) Length: 482 mm long (19&quot;)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6ES7 138-4DF01-0AB0</td>
<td>Interface module 1SI with RS 232C/422/485 serial interface; ASCII and 3964R protocol</td>
</tr>
<tr>
<td>6ES7 138-4CA01-0AA0</td>
<td>PM-E power module; 24 V DC/10 A With monitoring of the load voltage</td>
</tr>
<tr>
<td>6ES7 193-4CC20-0AA0</td>
<td>TM-P15S23-A1 terminal module 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals; Ordering unit: 1 units</td>
</tr>
<tr>
<td>6ES7 151-1BA02-0AB0</td>
<td>Interface module IM 151-1 for ET 200S, High Feature</td>
</tr>
</tbody>
</table>

### More information

Additional information is available on the Internet at:

www.siemens.com/simatic-PCS7-lab
11/2 SIMATIC powerrate for PCS 7: Power data evaluation/energy management

11/5 SENTRON 3WL / 3VL library for SIMATIC PCS 7

11/6 SENTRON PAC3200 block library for SIMATIC PCS 7
Overview

A prerequisite for improving the energy balance is exact knowledge of the consumption profile. Potential savings can only be identified when it is known how much of each type of energy is used.

With SIMATIC powerrate you can make the energy consumption transparent – from the infeed up to the consumer. SIMATIC powerrate can continuously record, save, and process the energy data, and visualize it on a faceplate. The integral load management function allows active monitoring of power limits according to process-specific and user-specific definitions. You are then able to fully utilize the power limits agreed in contracts, and avoid unnecessarily high energy prices or even penalty payments.

SIMATIC powerrate is completely integrated in SIMATIC PCS 7. Standard functionalities and standard interfaces of the process control system, e.g. to SIMATIC IT, can be used by SIMATIC powerrate without problem.

Note:
SIMATIC powerrate V4.0 can be used together with SIMATIC PCS 7 V7.1 (including ServicePacks).

Benefits

- Identification of energy-intensive loads and processes for the purpose of deriving measures for improving energy efficiency
- Comparison of consumption profiles for more efficient processes
- Optimizing the company according to energy parameters based on an assessment of consumption and costs
- Observation of supply limits agreed in contract to avoid higher energy supply costs or penalty payments
- Integration of the SENTRON PAC3200/PAC4200 multi-function measuring devices permit a fast overview of selected measured values and messages
- Integration of switches to provide information on the switch status, with the possibility for switching over
- Accurate assignment and comparison of the consumption data of specific work processes or batches

Design

SIMATIC powerrate comprises the following components:

- Blocks for:
  - Acquiring and conditioning energy data
  - Load management (trend calculation, limit monitoring, connection/disconnection of consumers)
  - Batch-related consumption recording
  - Integration of measuring equipment and switches
  - Elementary functions such as time synchronization, data buffering, or data exchange with archives
- Faceplates for:
  - Display and processing of the energy data
  - Display of results and for manual data input (configuration data or measured values)
- Excel reports for:
  - Assignment of energy data to cost centers
  - Batch-related evaluation
  - Determination and display of load duration curve as the decision basis for load management
- Data export to Excel

Function

Recording and conditioning energy data

The energy data of any PROFIBUS-compatible devices can be recorded by means of ready-to-use blocks, and archived for further use in the PCS 7 Tag Logging Archive. The data can be input to the function blocks in the form of counter pulses, counted values (absolute values or differences) or power values. Counted values can also be recorded manually.

The blocks determine power averages from the recorded data as well as work values for a defined period. In addition, they determine a predicted power end value for each period by means of extrapolation.

To simulate customized calculations, an example function (heat calculation) is available which can be adapted to customer requirements at any time over open interfaces.

Batch-related consumption recording

A batch comprises all units of a product that are produced in one production cycle, i.e. under identical conditions. The total energy consumption can be exactly determined for each batch as a result of batch-related consumption recording for five types of energy with up to 10 consumers each. Batch reports can be generated for analysis of the data (see data export and reporting).

Integration of SENTRON PAC3200/PAC4200

SENTRON PAC3200/PAC4200 multi-function measuring devices can be integrated into the acquisition of energy data by means of DPV1 communication. Selected values measured by these units can be displayed, as well as messages (e.g. current, voltage or pulse frequency too high) generated from the digital status information.

Integration of switches

Switch integration via digital inputs/outputs (DI/DO) supports display of the switch status (on, off, tripped, unplugged).

With the appropriate authorization, the switch can also be operated from the faceplate. Switching takes place in two steps (step 1: send switching command, step 2: confirm switching command). The switching command is only passed on to the switch following the confirmation.
Power management

### Displaying energy data

The energy data is displayed as average supply values or work values for an interval.

- Total value for the previous interval
- Actual value of the current interval
- Extrapolated value for the end of the current interval

Representation of the load curve permits the evaluation and tabular presentation of archived energy data.

### Data export and reporting

The SIMATIC PCS 7 operator system has internal access to the archived energy data. In addition, it can be exported directly to Microsoft Excel and processed further in accordance with customer requirements.

The following types of report can be generated in Microsoft Excel depending on the selected energy data:

- Cost accounts report
  - Assignment of consumption to cost accounts
  - Calculation of costs based on defined tariffs
  - Output as table or diagram

- Continuous curve
  - Evaluation of frequency of a particular mean supply value in a defined period
  - Fast recognition of brief supply peaks using this curve

- Batch report
  - Assignment of consumption to batches
  - Presentation of data sorted according to batch name or time

The generation of reports or exports can be time-controlled (daily, weekly, monthly) or triggered manually. Data access as well as report generation are also possible via a separate "office computer" with Microsoft Excel, i.e. separate from the operator system.

### Load management

If supply limits agreed in a contract are not observed (usually the 15-minute mean supply value for current), significantly higher supply prices or even penalty payments to the power supply utility may become necessary. Using cyclic trend calculations, the load management function of SIMATIC powerrate permits early recognition of limit violations, and signals these by means of warnings/alarms. Depending on the configuration, specific loads are switched off immediately in the event of an imminent limit violation. Should a limit violation nevertheless occur, the current load management data is archived for subsequent analysis.

To avoid unnecessary switching operations, the load management function can be simply and conveniently adapted directly on the faceplate to the current process conditions by a wide range of parameters.

The load management function can be used simultaneously for several different media (e.g. current, gas).

Loads distributed between different automation systems are linked into the load management by SIMATIC powerrate through AS-AS communication blocks. Load management is scalable according to the number of loads to be integrated or monitored (up to 10, 25, 50, 75 or 100 loads).

### Supplementary function

To avoid data loss in the event of a communication fault, the data are stored temporarily in a cyclic buffer of the SIMATIC PCS 7 automation system.

To guarantee synchronism with the power supply utility, it is possible to evaluate its synchronization pulse.

**Note:**

The following block libraries are supplied free of charge with the products "SIMATIC powerrate V4.0" and "SIMATIC powerrate Upgrade V3.0 to V4.0":

- SENTRON 3VL/3WL
- SENTRON PAC3200

Further information on these block libraries is available in Chapter "Energy Management" of this catalog in separate articles.
**Power management**

**Technical specifications**

<table>
<thead>
<tr>
<th>SIMATIC powerrate V4.0, system requirements</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC PCS 7 process control system</td>
<td>6AV6 372-1DE04-0AX0</td>
</tr>
<tr>
<td>Automation systems (controller)</td>
<td></td>
</tr>
<tr>
<td>Modular SIMATIC PCS 7 automation systems of the S7-400 range</td>
<td></td>
</tr>
<tr>
<td>SIMATIC PCS 7 AS RTX and SIMATIC PCS 7 BOX RTX on basis of WinAC RTX 2010 controller</td>
<td></td>
</tr>
<tr>
<td>SIMATIC powerrate reports</td>
<td></td>
</tr>
<tr>
<td>Microsoft Excel 2003 or Microsoft</td>
<td></td>
</tr>
<tr>
<td>Excel 2007</td>
<td></td>
</tr>
</tbody>
</table>

**Selection and ordering data**

**SIMATIC powerrate V4.0**
- Engineering and runtime software, software class A, 2 languages (German, English), with:
  - License for one SIMATIC PCS 7 operator station of type Server or Single Station 1)
  - WinCC/User Archives license for load management and batch-based energy measurement
  - Runtime license for any number of automation systems
- Type of delivery: Software and electronic documentation on CD 2), licenses (Certificate of License and License Key)

**SIMATIC powerrate trial license V4.0, 30 days**
- Engineering and runtime software, software class A, 2 languages (German, English)
- Type of delivery: Software and electronic documentation on CD

**SIMATIC powerrate Upgrade V3.0 to V4.0**
- Engineering and runtime software, software class A, 2 languages (German, English), with:
  - License for one SIMATIC PCS 7 operator station of type Server or Single Station 1)
  - WinCC/User Archives license for load management and batch-based energy measurement
  - Runtime license for any number of automation systems
- Type of delivery: Software and electronic documentation on CD 2), licenses (Certificate of License and License Key)

1) An additional SIMATIC PCS 7 powerrate license is required for each further SIMATIC PCS 7 operator station of type Server or Single Station; SIMATIC PCS 7 WS clients do not require a SIMATIC powerrate license.

2) SENTRON PAC3200 and SENTRON 3VL/3WL block libraries are supplied free of charge.

**More information**

Additional general information is available on the Internet at:

Information on the use of SIMATIC powerrate can be found at:
Overview

The SENTRON 3WL/3VL block library can be used to integrate the SENTRON circuit-breakers 3WL/3VL rapidly and simply into the SIMATIC PCS 7 process control system.

It comprises a driver block, a diagnostics block and faceplates. The blocks executed in the SIMATIC PCS 7 automation system supply the faceplates of the operator station with current, power and energy values, generate messages, and establish the link to the SIMATIC PCS 7 Maintenance Station.

Faceplates

The faceplates are the user interface for the SENTRON circuit-breakers 3WL/3VL in the operator station of the process control system. They permit display and simple operation of the SENTRON circuit-breakers using SIMATIC PCS 7 objects.

Use of the SENTRON 3WL/3VL block library for SIMATIC PCS 7 makes the plant more transparent. Critical plant statuses can then be detected rapidly, thus avoiding unnecessary costs resulting from failures. This provides sustained enhancement of plant availability.

Note:

The SENTRON 3WL/3VL block library can be used together with SIMATIC PCS 7 V6.1 (SP1 and higher), V7.0 and V7.1. It supports all operating systems of these system versions.

Function

- Total integration of the SENTRON circuit-breakers into the SIMATIC PCS 7 process control system via PROFIBUS DPV1 with certified SIMATIC PCS 7 add-on block library SENTRON 3WL/3VL
- Remote switching and monitoring
- Read-out of maintenance information
- Automatic information in event of overload, short-circuit or fault
- Read-out and display of device data
- Limit monitoring by the driver block
- Resetting of values on the device (min./max. values)

Selection and ordering data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3ZS2 782-1CC10-0YG0</td>
<td>SENTRON 3WL/3VL block library for SIMATIC PCS 7 V6.1 (SP1 and higher), V7.0 and V7.1</td>
</tr>
<tr>
<td>3ZS2 782-1CC10-6YH0</td>
<td>AS runtime license for SENTRON 3WL/3VL block library V1.0 for one automation system each (block library 3WL/3VL for SIMATIC PCS 7 required)</td>
</tr>
</tbody>
</table>

More information

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Industry Sector
Industry Automation Division
Industrial Automation Systems
Technical Assistance
Nuremberg
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**Overview**

**PCS 7 Add-on fit for SIMATIC PCS 7 V7**

The SENTRON PAC3200 block library permits seamless integration of the SENTRON PAC3200 or PAC4200 multi-function measuring devices operated on the PROFIBUS DP into the SIMATIC PCS 7 process control system. The functions of the PAC4200 are then supported corresponding to the scope of functions of the PAC3200.

The SENTRON PAC3200 block library consists of driver blocks, diagnostics blocks, and faceplates. The blocks executed in the SIMATIC PCS 7 automation system supply the faceplates of the operator station with energy data, generate messages, and establish the link to the SIMATIC PCS 7 Maintenance Station.

**Faceplates**

The faceplates are the user interface of the SENTRON PAC3200/ PAC4200 multi-function measuring devices in the operator station of the process control system.

All important electric variables of the PAC3200 are visualized on the SIMATIC PCS 7 operator station via the faceplates, and their limits monitored. Limit violations generate messages which are passed on to the signaling system of the operator system.

Bidirectional communication links between the faceplates and the blocks as well as between the blocks and the SENTRON PAC3200/PAC4200 on the system side support the display of values on the faceplates and the transfer of inputs to the multi-function measuring device.

**Note:**

The SENTRON PAC3200 block library can be used together with SIMATIC PCS 7 V6.1, V7.0 (SP3 and higher in each case) and V7.1. It supports all operating systems of these system versions. With SIMATIC PCS 7 V7.1 + SP2 and higher, blocks of the SENTRON PAC3200 block library also execute in automation systems with the WinAC RTX 2010 software controller.

**Function**

- Acyclic connection via PROFIBUS DPV1 for visualization tasks and acquisition of energy data
- Full integration of SENTRON PAC3200 in the SIMATIC PCS 7 process control system
- Support of PAC4200 corresponding to scope of functions of PAC3200
- Read-out and display of measured variables
- Input of limits for monitoring by the driver block
- Resetting of values on the device (min., max. values)

**Selection and ordering data**

<table>
<thead>
<tr>
<th>SENTRON PAC3200 block library for SIMATIC PCS 7 V6.1, V7.0 (SP3 and higher in each case) and V7.1</th>
<th>3ZS2 781-1CC11-0YG0</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENTRON PAC3200 V1.1 block library for SIMATIC PCS 7 AS blocks and faceplates for integration of the SENTRON PAC3200/PAC4200 multi-function measuring devices in SIMATIC PCS 7 V6.1, V7.0 (SP3 and higher in each case) and 7.1, electronic documentation, as well as: Engineering license for one engineering station Runtime license for one automation system Engineering and runtime software, software class A, 2 languages (German, English), single license for one installation Type of delivery: Software and electronic documentation on CD, engineering and runtime licenses as certificate of license</td>
<td>3ZS2 781-1CC10-6YH0</td>
</tr>
</tbody>
</table>

AS runtime license for SENTRON PAC3200 block library V1.1 for one automation system each (block library PAC3200 for SIMATIC PCS 7 required) Runtime software, software class A, 2 languages (German, English), single license for one installation Type of delivery: Runtime license as certificate of license without software or documentation

D: Subject to export regulations AL: N and ECCN: 5D992

**Note:**

The SENTRON PAC3200 block library is not available as a stand-alone product. It is also integrated in the SIMATIC PCS 7 add-on product "SIMATIC powerrate”.

**More information**

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Additional information is available on the Internet at:
www.siemens.de/powermanagementsystem
**Overview**

The cabinet construction described here permits the configuration of tailor-made cabinets for the SIMATIC PCS 7 automation systems AS 41x and for the ET 200M distributed I/O. Due to their modularity, the cabinets can very easily be adapted to different sizes and types of plant (batch or continuous process plants).

The preferred basic cabinet is the Siemens 8MC standard cabinet with IP40 degree of protection (closed) or IP20 degree of protection (with air slits in the door and perforated roof). If required, IP55 can be achieved by using an upgrade kit.

Fully assembled AS 41x system units and ET 200M I/O units are offered with all necessary accessories to supplement this basic cabinet.

**Note:**

The SIMATIC PCS 7 cabinet construction according to the description is suitable for SIMATIC PCS 7 V6 and V7.

<table>
<thead>
<tr>
<th>PCS 7 Add-on</th>
<th>fit for SIMATIC PCS 7 V7</th>
</tr>
</thead>
</table>

**Function**

**High level of flexibility**

- Future-proof thanks to universal modules that work with any system
- Flexible adaptation to the relevant application thanks to modular cabinet construction
- Basic and expansion cabinets are based on the same stock of modules
- Up to 4 system or 6 I/O units can be mounted in one cabinet, and where the cabinet is 600 mm deep, units can be mounted on both sides.
- System and I/O units can be combined within the cabinet.
- Side or dividing panels can be selected according to the application.
- Cabinets can fitted and bolted together - enabling cabinets to be combined in pairs or rows.
- All installation, commissioning, service and repair work is possible from the front of the cabinet.
- Construction supports appropriate handling when replacing modules.
- Construction of the feed line, optionally with circuit breakers (Siemens) or plug-in circuit breakers (from ETA with monitoring contact).
- Wiring of the electronic supply and external power supply of the I/O modules
- Wiring of the PROFIBUS DP from the system unit to the ET 200M I/O units and to the OLM or OSM using copper or fiber-optic cables.

**Consideration of hazardous area (Ex(i)) requirements**

- The construction of the system and I/O units permits a cabinet design that satisfies the Ex(i)-specific requirements (blue cable ducts, bus module covers, dividing segments).

**CE conformity**

- The cabinets are constructed in accordance with the VGB 4 guidelines.
- They are CE-compliant and conform to the guidelines laid down in the EMC legislation for electromagnetic compatibility.
### Selection and ordering data

<table>
<thead>
<tr>
<th>8MC cabinet</th>
<th>Order No.</th>
<th>6DL2 800-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabinet design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabinet with 19” mounting frame, crane lifting lugs, twist lever handle, pocket for circuit diagram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions H\times W\times D in mm, degree of protection:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cabinet with single-wing door</td>
<td>1 A</td>
<td></td>
</tr>
<tr>
<td>2000 \times 800 \times 400, IP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cabinet with single-wing door</td>
<td>1 B</td>
<td></td>
</tr>
<tr>
<td>2000 \times 800 \times 400, IP20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cabinet with single-wing door</td>
<td>2 A</td>
<td></td>
</tr>
<tr>
<td>2000 \times 800 \times 600, IP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cabinet with single-wing door</td>
<td>2 B</td>
<td></td>
</tr>
<tr>
<td>2000 \times 800 \times 600, IP20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cabinet with double-wing door</td>
<td>3 E</td>
<td></td>
</tr>
<tr>
<td>2000 \times 1000 \times 400, IP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cabinet with double-wing doors on front and back</td>
<td>4 G</td>
<td></td>
</tr>
<tr>
<td>2000 \times 1000 \times 600, IP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cabinet with single-wing door</td>
<td>5 J</td>
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</tr>
<tr>
<td>2200 \times 800 \times 400, IP40</td>
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<td></td>
</tr>
<tr>
<td>• Cabinet with single-wing doors on front and back</td>
<td>6 K</td>
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</tr>
<tr>
<td>2200 \times 800 \times 600, IP20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base</td>
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<td></td>
</tr>
<tr>
<td>Dimensions W\times D in mm:</td>
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<td></td>
</tr>
<tr>
<td>• Without base</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>• Base 800 \times 400</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>• Base 800 \times 600</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>• Base 1000 \times 400</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>• Base 1000 \times 600</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Side panel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions H\times D in mm:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Without side panel</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>• Side panel on left or right</td>
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</tr>
<tr>
<td>- 2000 \times 400</td>
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</tr>
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<td>- 2000 \times 600</td>
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<td>- 2200 \times 400</td>
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<tr>
<td>- 2200 \times 600</td>
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<td></td>
</tr>
<tr>
<td>I&amp;C monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Without I&amp;C monitoring</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>• Monitoring of the circuit-breakers (only for in-circuit emulator), display on cabinet lamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring of circuit-breaker (only with ICE), overheating, door monitoring, OLM, display by means of cabinet lamp and DI module 6ES7421-7DH00-0BA0 (DI module must be ordered separately)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Infeed

- No infeed | 0 X |
- 24 V DC with | |
  - 4 x Siemens circuit-breakers | 1 A |
  - 8 x Siemens circuit-breakers | 1 B |
  - 12 x Siemens circuit-breakers | 1 C |
  - 6 x ICE circuit-breakers with aux. contact | 1 E |
  - 12 x ICE circuit-breakers with aux. contact | 1 H |
- 24 V DC redundant with | |
  - 4 x Siemens circuit-breakers | 2 A |
  - 8 x Siemens circuit-breakers | 2 B |
  - 12 x Siemens circuit-breakers | 2 C |
  - 6 x ICE circuit-breakers with aux. contact | 2 E |
  - 12 x ICE circuit-breakers with aux. contact | 2 H |
- 120/230 V AC with | |
  - 4 x Siemens circuit-breakers | 3 A |
  - 8 x Siemens circuit-breakers | 3 B |
  - 12 x Siemens circuit-breakers | 3 C |
  - 6 x ICE circuit-breakers with aux. contact | 3 E |
  - 12 x ICE circuit-breakers with aux. contact | 3 H |

### Installation of system unit

- Without central unit | X |
  - 1 x bundle with UR2 or UR1 | A |
  - 2 x bundles with UR2 or UR1 | B |
  - 3 x bundles with UR2 or UR1 | C |
  - 4 x bundles with UR2 or UR1 | D |
  - 1 x bundle with UR2 or UR1, with OLM or OSM | E |
  - 2 x bundles with UR2 or UR1, with OLM or OSM | F |
  - 3 x bundles with UR2 or UR1, with OLM or OSM | G |
  - 4 x bundles with UR2 or UR1, with OLM or OSM | H |

### Documentation

- Without documentation | 0 |
- General description of cabinet | |
  - German | 1 |
  - English | 2 |
- Cabinet-specific documentation with AutoCAD drawings | |
  - German | 3 |
  - English | 4 |
- General description and cabinet-specific documentation with AutoCAD drawings | |
  - German | 5 |
  - English | 6 |
### Selection and ordering data (continued)

<table>
<thead>
<tr>
<th>Order No.</th>
<th>ET 200M I/O station</th>
<th>6DL2 802-.....</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIBUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>PROFIBUS DP in copper, for IM 153-1 and IM 153-2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PROFIBUS DP in copper, for redundant IM 153-2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PROFIBUS DP in fiber-optic, for IM 153-1 and IM 153-2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PROFIBUS DP in fiber-optic, for redundant IM 153-2</td>
<td></td>
</tr>
</tbody>
</table>

**ET rack**

- ET rack for non-redundant IM 153 without individual protection of the I/O modules, with only one circuit-breaker for IM 153 and load power supply, or one circuit-breaker for IM 153 and one circuit-breaker for load power supply (circuit-breakers must be ordered together with cabinet 6DL2800...)
- ET rack for redundant IM 153 without individual protection of the I/O modules, with one circuit-breaker for first IM 153, one circuit-breaker for second IM 153 and one circuit-breaker for load power supply (circuit-breakers must be ordered together with cabinet 6DL2800...)
- ET rack for redundant IM 153 without individual protection of the I/O modules, with one circuit-breaker for first IM 153, one circuit-breaker for second IM 153 and one circuit-breaker for load power supply (circuit-breakers must be ordered together with cabinet 6DL2800...)
- ET rack 230 V AC for redundant IM 153 without individual protection of the I/O modules, with one circuit-breaker for first 230 V PS and one circuit-breaker for second 230 V PS. The load power supply is provided via a diode module from the two PS (circuit-breakers must be ordered together with cabinet 6DL2800...)
- ET rack for non-redundant IM 153 with individual protection of the I/O modules, with only one circuit-breaker for IM 153 and load power supply, or one circuit-breaker for IM 153 and one circuit-breaker for load power supply (circuit-breakers must be ordered together with cabinet 6DL2800...)
- ET rack for redundant IM 153 with individual protection of the I/O modules, with one circuit-breaker for first IM 153, one circuit-breaker for second IM 153 and one circuit-breaker for load power supply (circuit-breakers must be ordered together with cabinet 6DL2800...)
- ET rack for redundant IM 153 with individual protection of the I/O modules, with one circuit-breaker for first IM 153 and one circuit-breaker for second IM 153. The load power supply is provided via a diode module from the circuit-breakers of the IM (circuit-breakers must be ordered together with cabinet 6DL2800...)
- ET rack 230 V AC for redundant IM 153 with individual protection of the I/O modules, with one circuit-breaker for first 230 V PS and one circuit-breaker for second 230 V PS. The load power supply is provided via a diode module from the two PS (circuit-breakers must be ordered together with cabinet 6DL2800...)

---

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## Selection and ordering data (continued)

<table>
<thead>
<tr>
<th>Option Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation of the I/O modules</td>
<td></td>
</tr>
<tr>
<td>- Without installation of the I/O modules</td>
<td>0</td>
</tr>
<tr>
<td>- Without installation of the I/O modules, prepared with isolating element and</td>
<td>1</td>
</tr>
<tr>
<td>partition in cable duct for Ex(i) design</td>
<td>2</td>
</tr>
<tr>
<td>- Installation of 4 I/O modules, connect L+ and M supply, test and parameterize</td>
<td>3</td>
</tr>
<tr>
<td>modules</td>
<td>4</td>
</tr>
<tr>
<td>- Installation of 8 I/O modules, connect L+ and M supply, test and parameterize</td>
<td>5</td>
</tr>
<tr>
<td>modules</td>
<td></td>
</tr>
<tr>
<td>- Installation of 4 I/O modules for Ex(i), connect L+ and M supply, test and</td>
<td></td>
</tr>
<tr>
<td>parameterize modules, cable guide for L+ I/O module supply, isolating element</td>
<td></td>
</tr>
<tr>
<td>between non-hazardous and hazardous areas, partition in cable duct, cable duct</td>
<td></td>
</tr>
<tr>
<td>marked in blue</td>
<td></td>
</tr>
<tr>
<td>- Installation of 8 I/O modules for Ex(i), connect L+ and M supply, test and</td>
<td></td>
</tr>
<tr>
<td>parameterize modules, cable guide for L+ I/O module supply, isolating element</td>
<td></td>
</tr>
<tr>
<td>between non-hazardous and hazardous areas, partition in cable duct, cable duct</td>
<td></td>
</tr>
<tr>
<td>marked in blue</td>
<td></td>
</tr>
<tr>
<td>Tests</td>
<td></td>
</tr>
<tr>
<td>- Without testing of I/O functions</td>
<td>0</td>
</tr>
<tr>
<td>- Function testing of inputs/outputs for 4 modules</td>
<td>1</td>
</tr>
<tr>
<td>- Function testing of inputs/outputs for 8 modules</td>
<td>2</td>
</tr>
<tr>
<td>DP/PA coupler</td>
<td></td>
</tr>
<tr>
<td>- Installation, wiring and bus connection of up to 4 DP/PA couplers on 19&quot; DIN</td>
<td>6DL2 803-1AA00</td>
</tr>
<tr>
<td>rails without individual protection of the I/O modules</td>
<td></td>
</tr>
<tr>
<td>Order DP bus connectors separately according to number of couplers.</td>
<td></td>
</tr>
<tr>
<td>- Installation, wiring and bus connection of up to 4 DP/PA couplers on 19&quot; DIN</td>
<td>6DL2 803-1AA10</td>
</tr>
<tr>
<td>rails with individual protection of the I/O modules</td>
<td></td>
</tr>
<tr>
<td>Order DP bus connectors separately according to number of couplers.</td>
<td></td>
</tr>
<tr>
<td>PA link</td>
<td></td>
</tr>
<tr>
<td>- Installation, wiring and bus connection of IM 157 and up to 4 DP/PA links/couplers</td>
<td>6DL2 803-1BA00</td>
</tr>
<tr>
<td>on 19&quot; DIN rails without individual protection of the I/O modules</td>
<td></td>
</tr>
<tr>
<td>Order bus modules separately for hot swapping function.</td>
<td></td>
</tr>
<tr>
<td>- Installation, wiring and bus connection of IM 157 and up to 4 DP/PA links/couplers</td>
<td>6DL2 803-1BA10</td>
</tr>
<tr>
<td>on 19&quot; DIN rails with individual protection of the I/O modules</td>
<td></td>
</tr>
<tr>
<td>Order bus modules separately for hot swapping function.</td>
<td></td>
</tr>
</tbody>
</table>

## Options

### Project-specific cabinets

Apart from the standardized cabinets, we manufacture cabinets for specific projects or customer requirements:
- Cabinets of different sizes and designs
- Small wall-mounted enclosure for distributed configuration
- Outdoor units with air conditioning

All are offered optionally as Ex versions and with non-standard degrees of protection such as NEMA 4x or IP66.

## More information

Siemens AG  
Industry Sector  
Industry Automation Division  
Control Components and Systems Engineering Karlsruhe  
Phone: +49 721 595-3776  
Fax: +49 721 595-6525  
E-mail: addon_s2AUD@siemens.com
Time synchronization

SICLOCK time synchronization
Overview

- SICLOCK TC 400 and TC 100 central plant clock as the central component for time synchronization of a plant over Ethernet
- SICLOCK TC 400
  - Four independent Ethernet interfaces for supporting several Ethernet subnets
  - Redundancy options
  - Designed for PROFINET
- SICLOCK TC 100
  - An Ethernet interface
  - Designed for mini and small plants
  - Designed for PROFINET
- GPS or DCF77 radio clocks for direct connection to PCs, SIMATIC S7 controllers, and to the SICLOCK TC 400 or TC 100 central plant clocks
- Pulse converter for electrical and optical distribution and interface conversion
- Complete packages for common applications

Application

Time synchronization of all components plays an important part in the automation of production plants. The SICLOCK system is a parameterizable, modular system with perfectly matched components for the time synchronization of plants. GPS (worldwide) as well as DCF77 (Germany) can be used for external radio synchronization.

The modular SICLOCK system supports the time synchronization of an individual PLC through to the large plant with multiple redundancy.

Time synchronization concepts

The automation systems and operator stations of a SIMATIC PCS 7 plant or WinCC stations can be synchronized as follows with DCF77 or GPS time signals:

- Large plants: For larger plants with many network stations and stringent requirements for timekeeping, the time synchronization is performed using a SICLOCK TC 400 central plant clock on the plant bus.
- Small plants: For small to medium-sized plants, the PCS 7 Operator Station or the WinCC Station are used as the time master, connecting the corresponding DCF or GPS radio clock directly to the COM interface of the PC. An alternative to the PC solution is the option of synchronizing the plant over the NTP via the SICLOCK central plant clocks. The SICLOCK TC 100 is recommended for use with these small plants.
- Stand-alone systems: For SIMATIC S7 controllers or small systems, e.g. for laboratory automation, SICLOCK DCF7 is a low-cost alternative to DCF77 synchronization directly over an S7 digital input.

Design

SICLOCK TC 400 and TC 100 are designed for mounting on a SIMATIC rail. Sets of materials for installation in 19-inch racks are also available.

Function

Central plant clocks

The SICLOCK TC 400 and SICLOCK TC 100 central plant clocks support the synchronization of CPUs and PCs with the SIMATIC procedure as well as the NTP procedure over Industrial Ethernet.

SICLOCK TC 400

SICLOCK TC 400 is used as a central plant clock for highly accurate timekeeping and distributes the time to all synchronized systems over Industrial Ethernet, as well as over three additional point-to-point connections with TTY/24 V and RS422/5 V.

The devices are equipped with four independent Ethernet interfaces. This enables separate or redundant automation networks and I&C networks to be synchronized in parallel with just one device. Apart from the well-proven standard networks such as SIMATIC NET or NTP, TC 400 is also prepared for use in PROFINET.

Interfaces, signal types, redundancy, etc. are parameterized over the Internet/HMI. The display of statuses on the device provides fast access to the operating status and any faults.

SICLOCK TC 400 has interrupt capability and can be integrated into the I&C.

SICLOCK TC 100

SICLOCK TC 100 is the "little sister" of the TC 400 and is used as a central plant clock for highly accurate time synchronization. It distributes the time to all systems to be synchronized over an Industrial Ethernet interface.

Like the TC 400, the interfaces, signal types, redundancy, etc. are parameterized over the Internet/HMI. The display of statuses on the device provides fast access to the operating status and any faults.

SICLOCK TC 100 has interrupt capability and can be integrated into the I&C.

On failure of the antennas of radio clocks, the central plant clocks SICLOCK TC 400 and SICLOCK TC 100 continue to provide reliable clock control thanks to automatic changeover to highly accurate quartz operation. When the radio clock is returned to service, they accept the time signal without a time step.
## Selection and ordering data

<table>
<thead>
<tr>
<th>SICLOCK TC 400 central plant clock</th>
<th>Order No.</th>
<th>SICLOCK TC 400 with GPS1000 antenna, complete package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package comprises</td>
<td>2XV9 450-2AR10</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TC 400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• SICLOCK GPS1000 system with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>antenna rack and approx. 2 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>connecting cable, extendable to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>max. 1000 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lightning protection for GPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete solution, e.g. for use in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIMATIC PCS 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SICLOCK TC 400 central plant clock</th>
<th>Order No.</th>
<th>SICLOCK TC 400 with DCF77 antenna, complete package</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK TC 400 central plant clock with Ethernet interface + DCFRS radio clock, industrial version; package comprises</td>
<td>2XV9 450-2AR20</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TC 400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Active DCF77 antenna with TTY output (20 mA line current), antenna rack, and approx. 2 m connecting cable, extendable to max. 1000 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Junction box</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| SICLOCK TC 400 single device       | Order No. | 2XV9 450-2AR01 |

<table>
<thead>
<tr>
<th>SICLOCK TC 100 central plant clock</th>
<th>Order No.</th>
<th>SICLOCK TC 100 with GPS1000 antenna, complete package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package comprises</td>
<td>2XV9 450-2AR50</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TC 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• SICLOCK GPS1000 system with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>antenna rack and approx. 2 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>connecting cable, extendable to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>max. 1000 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lightning protection for GPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete solution, e.g. for use in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIMATIC PCS 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SICLOCK TC 100 central plant clock</th>
<th>Order No.</th>
<th>SICLOCK TC 100 with DCF77 antenna, complete package</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK TC 100 central plant clock with Ethernet interface and DCFRS radio clock, industrial version; package comprises</td>
<td>2XV9 450-2AR26</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TC 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Active DCF77 antenna with TTY output (20 mA line current), antenna frame, and approx. 2 m connecting cable, extendable to max. 1000 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Junction box</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| SICLOCK TC 100 single device       | Order No. | 2XV9 450-2AR22 |

A: Subject to export regulations AL: N and ECCN: 7A994A

## DCF radio clocks

<table>
<thead>
<tr>
<th>DCF radio clocks</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK DCFRS, radio clock, industrial version</td>
<td>2XV9 450-1AR21</td>
</tr>
<tr>
<td>DCF radio clock for time synchronization of individual PCs or servers in industrial environments with high levels of interference; distances of up to 1000 m are possible between the DCF radio clock and the PC, package comprises</td>
<td></td>
</tr>
<tr>
<td>• Active DCF77 antenna with TTY output (20 mA line current) and antenna frame</td>
<td></td>
</tr>
<tr>
<td>• TTY/RS232 converter</td>
<td></td>
</tr>
<tr>
<td>• Plug-in power supply</td>
<td></td>
</tr>
<tr>
<td>• Two junction boxes</td>
<td></td>
</tr>
<tr>
<td>• 1 m connecting cable mounted, extendable to 1000 m</td>
<td></td>
</tr>
<tr>
<td>• DCF77 receiving service for Windows</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SICLOCK DCFRS, radio clock for Windows</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK DCFRS, radio clock for Windows</td>
<td>2XV9 450-1AR14</td>
</tr>
<tr>
<td>DCF radio clock for the time synchronization of individual PCs over short distances, package comprises</td>
<td></td>
</tr>
<tr>
<td>• Active DCF77 antennas with RS232 interface and mounting bracket</td>
<td></td>
</tr>
<tr>
<td>• 20 m connecting cable, mounted</td>
<td></td>
</tr>
<tr>
<td>• DCF77 receiving service for Windows</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SICLOCK DCFS7</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK DCFS7</td>
<td>2XV9 450-1AR36</td>
</tr>
<tr>
<td>Low-cost solution for time synchronization of SIMATIC S7-300/400 over DCF77 over one digital input, package comprises</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK DCFRS, radio clock with RS232 output, 20 m connecting cable and mounting bracket</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK DCFS7 interface</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK DCFS7 receiving service (STEP 7 function block for integration in S7 software)</td>
<td></td>
</tr>
</tbody>
</table>

## Accessories for SICLOCK DCFS7

<table>
<thead>
<tr>
<th>Accessories for SICLOCK DCFS7</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK DCFS7 interface + receiving service</td>
<td>2XV9 450-1AR30</td>
</tr>
<tr>
<td>(STEP 7 function block for integration in S7 software)</td>
<td></td>
</tr>
<tr>
<td>SICLOCK DCFS7 interface</td>
<td>2XV9 450-1AR35</td>
</tr>
<tr>
<td>SICLOCK DCFS7 receiving service</td>
<td>2XV9 450-1AR32</td>
</tr>
<tr>
<td>(STEP 7 function block for integration in S7 software)</td>
<td></td>
</tr>
</tbody>
</table>
## Ordering data

**GPS radio clocks**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2XV9 450-1AR82</td>
<td>GPS1000 + power supply, radio clock for Windows</td>
</tr>
</tbody>
</table>

GPS radio clock for the time synchronization of PCs, programmable controllers, as well as the SICLOCK TC 400/TC 100 central plant clocks in industrial environments with high levels of interference with distances up to 1000 m between the antenna and the device, package comprises
- GPS1000 antenna head with antenna frame
- GPS1000 power supply
- Junction box
- 5 m RS232 connecting cable
- DCF77 receiving service for Windows

A: Subject to export regulations AL: N and ECCN: 7A994A

## Accessories

**Kit for SICLOCK TC400 and TC100**

- For 19” mounting frame

**Lightning protection for antenna cable**

- Lightning protection for TTY connecting cable (SICLOCK GPS1000/DCFRS industrial version)

**Software**

- SICLOCK DCF77 receiving service for Windows

**Pulse converter**

- SICLOCK EOPC
  - Electrical/optical pulse converter for industrial applications with 32 fiber-optic cable outlets for transparent operation and pulse mode
  - SICLOCK EOPC 24 to 110 V DC
  - SICLOCK EOPC 90 to 230 V AC/DC

- SICLOCK PCON
  - Single-channel electrical/optical pulse converter for industrial applications
  - SICLOCK PCON 24 to 230 V AC/DC, with multi-mode fiberglass connection, 820 nm

- SICLOCK DCFHF
  - HF modulator for DCF77 signals for industrial applications

## More information

Support can be found at: [www.siemens.com/simatic-net/ik-info](http://www.siemens.com/simatic-net/ik-info)

You will find more information on the Internet at: [www.siemens.com/siclock](http://www.siemens.com/siclock)
## Premium Services for process optimization

14/2  Introduction
14/3  Premium Service "Batch to Conti"
14/5  Premium Service "Energy study"
14/7  Premium Service
  "Material flow optimization"
14/9  Premium Service
  "Operator Training System"
14/11 Premium Service
  "SIMATIC SIPAT Consulting"
14/13 Premium Service
  "Advanced Process Control"
14/15 Premium Service
  "Asset Management"
Premium Services: modular range of services for process optimization

Continuous technological developments result in increasingly effective processes for manufacturing high-quality products with minimum use of materials and energy.

To remain successful in the permanently increasing international competition, it is more important than ever today to consistently utilize all potentials for optimization. A decisive factor toward achieving success is to find the perfect balance between quality, time and costs.

Siemens has experts who are highly acquainted with technological processes as well as the latest developments and methods for process optimization. These offer you service modules as Premium Services for different methods for process optimization.

**Module 1:**
**Determination of potential through analysis by experts**
- One-day workshop to assess the process
- Participants: Siemens experts and representatives of the client with profound knowledge of the process
- Result: Documentation with qualitative evaluation of the optimization potential, and specific recommendations for further actions

**Module 2:**
**Preparation of a feasibility study**
- Feasibility study for detailed, project-based process analysis with qualitative and quantitative evaluation of the benefits of process optimization
- Participants: Siemens experts and client personnel responsible for the process
- Result: Feasibility study, consisting of documentation on trials, qualitative and quantitative evaluation of the optimization potential (Return on Investment), and specific recommendations for implementation

**Module 3:**
**Implementation of the produced feasibility study**
- Implementation of knowledge gained in Modules 1 and 2 in a specific project
- The content is extremely variable, and therefore part of an individual agreement between Siemens and the client; Siemens provides a project-specific quotation in each case
Overview

The fine and special chemicals industries, as well as the pharmaceutical industry, are traditionally dominated by batch and semi-batch processes. However, continuous developments in the chemical reaction technology sector mean that continuous modes have become increasingly attractive in the meantime. In particular, the increase in product selectivity and yield as well as improvements in energy efficiency are important arguments with many production procedures for transferring from batch to continuous mode.

With the Premium Service "Batch to Conti", Siemens offers customers from the chemical and pharmaceutical industries comprehensive services for optimization of their production processes through conversion of conventional batch or semi-batch processes to continuous mode. The services have a modular structure, and extend from pure consulting through experimental investigations up to rebuilding of plants.

Benefits

- Increase in selectivity and yield
- Saving of up to 80% of energy costs
- Constantly high product quality
- Small space requirements of production plants allows decentralization of production and shortening of transport paths
- Increased safety through plant enclosure and short standstill
- Reduction of scale-up risks, even with extremely fast and highly exothermic reactions
- High space/time yields as result of low reactor volumes and shorter times for heating, cooling, filling, and emptying
- Reduction in number of individual process steps
- Process development, engineering and plant construction from a full-line supplier

These advantages are largely independent of the plant size and the production capacity. The difference they make primarily depends on the industrial characteristic of the process.

Application

The services of the Premium Service "Batch to Conti" are mainly suitable for:

- Production processes in the chemical and pharmaceutical industries
- Optimization of chemical reactions and processes

They are particularly advantageous for:

- Development of processes whose starting materials are only available in small quantities
- Fast, highly exothermic reactions (examples: organometallic reactions with Grignard compounds, butyl lithium or complex metal hydrides)
- Reactions with unstable intermediates
- Reactions taking place in classical batch or semi-batch mode at very low temperatures (-30 °C and lower)
- Reactions with unsatisfactory selectivities and/or yields
- Reactions with problematical or even impossible scale-up
- Particularly safety-relevant reactions

Design

The Premium Service "Batch to Conti" consists of three modules which build upon each other and which can be ordered individually:

Module 1: Determination of batch-to-continuous optimization potential through analysis by experts

- One-day workshop to analyze the chemical synthesis processes
- Participants: Siemens experts and representatives of the client with profound knowledge of the process
- Pre-definition of workshop details between client and contractor, e.g. discussion of the chemical processes and visiting of the existing production plant
- Qualitative evaluation of the optimization potential with consideration of possible energy savings, expected increase in product yield, required investment, scale-up possibilities, and safety aspects
- Result: Workshop documentation with qualitative evaluation of the batch-to-continuous potential, and specific recommendations for further actions
Module 2: Preparation of a feasibility study

- One-week feasibility study for detailed, project-based process analysis with qualitative and quantitative evaluation of the benefits of process optimization
- Participants: Siemens experts and representatives of the client
- Experimental investigation of the optimization potential determined in Module 1 by means of laboratory tests
- Individual targets are, e.g.:
  - Increase in yield and space/time turnover
  - Integration of several reaction stages in one equipment
- Inclusive services:
  - Project-specific adaptation of the continuous laboratory system for the tests (max. 2 days in the laboratory)
  - Production of a test plan and agreement with the client
  - Carrying out of tests (4 days in the laboratory)
  - Processing and documentation of test results
- Extra services (separate charge):
  - Analysis of test samples: agreement on analytical methods between client and contractor, billing of analyses carried out by Siemens according to actual requirement
- Result: Feasibility study, consisting of documentation on trials, qualitative and quantitative evaluation of the optimization potential (Return on Investment), and specific recommendations for implementation

Module 3: Implementation of the produced feasibility study

- Implementation of knowledge gained in Modules 1 and 2 in a specific project
- Content is the subject of an individual agreement between client and contractor
- Basis for the individual agreement is a project-specific quotation provided by Siemens as the contractor
- Inquiries for production of a quotation should be directed to the address specified under "Further information"

Note:
The modules of the Premium Service "Batch to Conti" do not include any traveling expenses. Traveling expenses from the Hoechst Industrial Estate, Frankfurt am Main, Germany, will be invoiced separately.
**Overview**

Increasing cost pressures, strong competition, stricter statutory directives, and high energy prices are great challenges for energy-intensive industries such as chemicals and pharmaceuticals. Plants can only remain economical in the future if the owners continuously modify them in accordance with the current demands.

With its Premium Service "Energy study", Siemens offers you holistic solutions with associated process optimization options for reducing operating costs. The Premium Service "Energy study" has a modular structure. The range of services covers evaluation of the plant’s energy requirements, the preparation of a feasibility study for effective energy-saving measures, up to specific implementation of the determined measures in the plant.

**Benefits**

- Industrial plant optimization for reduction of energy consumption and operating costs
- Reduction in emissions and improved conformity with statutory directives
- Increase in plant availability through process improvements and modifications
- Development of new, innovative processes with significantly lower energy consumption
- Vendor-independent design of equipment and plant components when converting
- Determination of investment costs and amortization times for individual projects
- Planning and construction of plants from a full-line supplier

These advantages are partially dependent on the plant size and the production capacity. The difference they make primarily depends on the industrial characteristic of the process.

**Application**

- Production processes in energy-intensive industries, e.g. chemicals and pharmaceuticals
- Plants older than 5 years
- Plants with high emission values
- Plants with high consumption of heating agent, e.g. heating steam
- Plants with high consumption of cooling agent, e.g. cooling brine
- Plants frequently operated at partial load
- Plants without thermal integration (use of heat sources and sinks)
- Plants with large, unused heat sources, e.g. hot exhaust gases

**Design**

The Premium Service "Energy study" consists of three modules which build upon each other and which can be ordered individually:

**Module 1:**

- **Determination of energy saving potential through analysis by experts**
  - One-day workshop to analyze the energy saving potential for a production process
  - Participants: Siemens experts and representatives of the client with profound knowledge of the process
  - Submission of a catalog of questions and a list of required data to the client for preparation of the workshop
  - Consideration of plant criteria such as plant size, mode of operation, significant heating and cooling media, existing thermal integration
  - Discussion of production process and possibly visiting of the existing production plant
  - Result: Workshop documentation with evaluation of the energy saving potential, and specific recommendations for further actions

**Module 2:**

- **Preparation of a feasibility study (energy study)**
  - Feasibility study for detailed, project-based process analysis with qualitative and quantitative evaluation of the energy saving potential
  - Goals: Detailed overview of energy consumption in the investigated process; suggestions and assessments of possible energy saving measures
  - Participants: Siemens experts and representatives of the client
  - Generation of an energy balance based on the results of Module 1 or information provided by the client such as:
    - Quantity balance
    - Plant/process description as well as flowcharts and overviews of the energy/media consumptions (e.g. from the design documents)
    - Clear representation of the production process (PFD/PID)
    - Overview of the plant’s energy consumption referred to the various media (per month for a period of one year)
    - Consumption costs at the site for the various media (steam, electricity etc.)
  - Result: Documentation of the process-specific energy and quantity balances, as well as suggestions in order of priority for implementation of energy saving measures in the form of a feasibility study
Module 3: Implementation of the produced feasibility study
- Implementation of the knowledge gained in Modules 1 and 2
- Detailed processing and implementation of the energy saving measures assigned a high priority
- Content is the subject of an individual agreement between client and contractor
- Basis for the individual agreement is a project-specific quotation provided by Siemens as the contractor
- Inquiries for production of a quotation should be directed to the address specified under "Further information"

Note:
The modules of the Premium Service "Energy study" do not include any traveling expenses. Traveling expenses from the Hoechst Industrial Estate, Frankfurt am Main, Germany, will be invoiced separately.

Selection and ordering data

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More information
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As a result of permanently increasing competition in the process industry, more products of improved quality must be produced within the same time. This of course also has effects on process procedures associated with company logistics (intralogistics).

The demands placed on the logistics performance are increased even further by manufacturing to order, minimization of throughput times, and reduction in warehouse ranges. As a result, a company’s success is becoming increasingly dependent on supply chain management.

Since production is being increasingly concentrated at a few global locations, the material flow must be correspondingly accelerated there. This requires appropriate concepts with which the material flow can be optimized in the existing environment.

With its Premium Service "Material flow optimization", Siemens offers you services for generating and implementing intelligent, future-oriented concepts. With Siemens as a service partner, you have access to experts who are not only acquainted with intralogistics and automation technology, but also have sound process know-how.

Benefits
- Optimization of intercompany procedures through identification and elimination of bottlenecks
- Increase in performance through elimination of unnecessary buffer times in favor of continuous processes
- Increase in plant flexibility through optimized controls
- Planning, invitation to bid, project management, and supervision of assembly and deadlines all from a full-line supplier

Module 1: Determination of optimization potential through analysis by experts
- One-day workshop to analyze the intralogistics with the objective of gaining an overview of the logistics processes and determination of potentials for optimization
- Participants: Siemens experts and representatives of the client with profound specialized knowledge
- Submission of a catalog of questions and a list of required data to the client for preparation of the workshop
- Systematic discussion of the logistics processes with the client's experts
- Result: Workshop documentation with evaluation of the optimization potential, and specific recommendations for further actions

Module 2: Preparation of a feasibility study
- Intensive investigation of the optimization options determined in Module 1 and elaboration of specific implementation measures
- Participants: Siemens experts and representatives of the client
- Exploration of plant layout and process procedures, optionally with support by simulation programs such as INOSIM or PLANT SIMULATION
- Possibly recording of further data in the client’s plant depending on the optimization approach
- Result: Detailed documentation of the recommended implementation measures with:
  - Assessment of the optimization potential
  - Approximate estimate of costs (accuracy ± 25%)
  - Basic deadlines for implementation of measures

Module 3: Implementation of the produced feasibility study
- Implementation of the knowledge gained in Modules 1 and 2
- Content is the subject of an individual agreement between client and contractor
- Basis for the individual agreement is a project-specific quotation provided by Siemens as the contractor
- Inquiries for production of a quotation should be directed to the address specified under "Further information"

Note:
The modules of the Premium Service "Material flow optimization" do not include any traveling expenses. Traveling expenses from the Hoechst Industrial Estate, Frankfurt am Main, Germany, will be invoiced separately.
### Premium Service "Material flow optimization"

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Overview

Using an Operator Training System (OTS), plant operators, plant engineers and product development engineers can train the operation of a production plant as well as the situation-dependent response to specific events in a safely controlled environment. The OTS for plant operators in the chemical and pharmaceutical industries can be compared with the flight simulator for pilots.

In order to make training as realistic as possible, the operator stations and the operator interfaces (process images) of the OTS from Siemens exactly map the real plant. Simulation includes the functions of the equipment and field devices as well as the process data.

The OTS from Siemens particularly features the following:

- Dynamic - the chemical or pharmaceutical plant is modeled dynamically.
- Tailored - plant operators or licensors integrate their operating experience into the training scenarios.
- Flexible - the process control system can be emulated completely or partially.

With its Premium Service "Operator Training System", Siemens allows you to individually adapt the OTS to the training requirements of the customer's respective plant.

Benefits

- Uniformly high training level for all plant operators
- Time savings during startup and with changes in production
- Improved plant availability
- Reduced production downtimes
- Correct, safe and fast response in event of faults
- Improved understanding of the process
- Optimized operator interventions
- Optimized control
- Safe mastering of control technology
- Improvements regarding retention of quality limits

Application

An Operator Training System from Siemens is worth considering in the following cases:

- Chemical or pharmaceutical process
- Process with many feedbacks and interconnections
- Process is complex
- New plant or control technology
- Frequent startup/shutdown of plant
- Many changes in product and/or load
- Personnel qualifications should be improved
- Faults and downtimes due to maloperations
- Frequent change in personnel
- Variations in production depending on shift workers
- Ratio of rejects too high
- Product quality or energy consumption can be improved through optimized operator prompting
- Testing of different operating strategies or control concepts
- Testing and checking of operating instructions

Design

The Premium Service "Operator Training System" consists of three modules which build upon each other and which can be ordered individually:

Module 1: Determination, coordination and evaluation of aspects relevant to an OTS

- One-day workshop for qualitative evaluation of the practicability and advantages of an OTS
- Participants: Siemens experts and representatives of the client with profound knowledge of the process
- Discussion of the process with the client's experts, e.g. on the basis of process flowcharts and descriptions
- Presentation of basic OTS functionalities using different OTS types and examples
- Recording of possible process faults and failures, and identification of critical process steps
- Derivation of OTS tasks, and discussion of potential improvements, with consideration of the plant's special features, the qualification level of the operators, and typical operating modes and failures
- Result: Written documentation of the aspects and advantages elaborated in the workshop, and estimation of the practicability
Module 2: Preparation of a feasibility study

- One-week feasibility study for detailed processing of an individual OTS (requirements, targets, options for improvement, basic structure)
- Participants: Siemens experts and representatives of the client
- Provision of the data required for planning the OTS by the client, e.g. process descriptions, flowcharts, process data, models, and model descriptions
- Analysis of all process steps, and selection of the plant components relevant to the OTS
- Investigation of existing process models, and testing of possible modeling approaches
- Discussion and selection of the training situations relevant to the OTS (startup/shutdown, changes in type and products, etc.), fault and failure scenarios
- Planning of the OTS architecture, and selection of suitable components
- Result: Detailed documentation of the planned OTS with the following contents:
  - Design and implementation
  - Scope of services and delivery
  - Schedule and costs for implementation
  - Savings potential

Module 3: Implementation of the produced feasibility study

- Development and installation of an OTS based on the results provided in Modules 1 and 2
- Content is the subject of an individual agreement between client and contractor
- Basis for the individual agreement is a project-specific quotation provided by Siemens as the contractor
- Inquiries for production of a quotation should be directed to the address specified under "Further information"

Note:
The modules of the Premium Service "Operator Training System" do not include any traveling expenses. Traveling expenses from the Hoechst Industrial Estate, Frankfurt am Main, Germany, will be invoiced separately.
The US Food & Drug Administration (FDA) recognized that the introduction of efficient production procedures in the pharmaceutical industry was hampered in the past by legal obstacles. To simplify and accelerate the development and introduction of products, therefore, it drew up a specification for process analytical technology (PAT) and adopted this in its final version in September 2004.

PAT is a system with which product development and production processes can be designed, analyzed and controlled on the basis of real-time measurements of critical quality and performance attributes in such as way that the achievement of the quality required for the end product can be guaranteed. According to this system, the production takes place in a strictly controlled process that is oriented toward producing products of perfect quality.

The real-time tracking of the parameters relevant for product quality also aids better understanding and management of the overall process as well as avoiding or considerably reducing the scope of final inspections. The preparation of samples for quality control at the end of the process (which can sometimes be extremely time-consuming) or for follow-up checks can thus be omitted.

With SIMATIC SIPAT, Siemens has a powerful software platform for PAT implementation in product development and production processes (for details, see Chapter "Industry Applications", Section "Process Analytical Technology").

To accompany this, Siemens offers the Premium Service SIMATIC SIPAT Consulting particularly for customers from the pharmaceutical industry and related industries. This provides additional consultation services as well as experimental investigations for the PAT integration, providing valuable support in the development, pilot project and production phases:

- Project management
- Evaluation of suitable production processes
- Evaluation of suitable analytical processes
- Process optimization
- Risk analysis
- Design of Experiment
- Multivariate data analysis
- Personnel training

**Benefits**

- Fast capture of information about the key parameters of the manufacturing process
- Reproducible process permit consistently high product quality
- Qualitative early indication on the basis of an improved understanding of the process
- Sensitive processes can be controlled/regulated around the clock
- Reduction or elimination of release tests for intermediate and end products
- Future legal requirements with regard to risk-based validation can already be implemented today
- Shortening of process cycle times and improvement of total performance of the process
- Maximization of product yield
- Saving of raw and auxiliary materials
- Minimization of scale-up risks

**Design**

The Premium Service SIMATIC SIPAT Consulting is split into three complementary modules that can be ordered individually:

**Module 1:** *Determination of PAT potential through analysis by experts*

- One-day workshop for analyzing the customer’s production processes
- Participants: Siemens experts and representatives of the client with profound knowledge of the process
- Pre-definition of workshop details between client and contractor, e.g. discussion of the client’s production processes and possible real-time process analysis systems, if necessary including tour of the existing production plant
- Assessment of the benefit of the PAT implementation on the basis of criteria such as:
  - Avoidable incorrect batches
  - Reducible release tests
  - Effect on process cycle times
  - Necessary investment
- Result: Workshop documentation with qualitative evaluation of the PAT potential, and specific recommendations for further actions
Module 2: Preparation of a feasibility study

- Feasibility study to verify and narrow down the potential identified in Module 1 (processing time up to two weeks):
  - Detailed consideration of as many as 10 recorded processing steps
  - Closer examination of potential process analysis systems with regard to suitability and integration into the process
- Participants: Siemens experts and representatives of the client
- Basic material:
  - Customer information
  - Values gained from own experience
  - Literature about process analysis systems
  - Results of an expert analysis (Module 1)
- Inclusive services:
  - Evaluation of existing production processes, process parameters and process controls: Apparatus, process knowledge, process control, manageability and performance capability of the processes, specifications of the raw materials
  - Evaluation of product quality: Identification of the known quality parameters, their limits and analytical test methods
  - Correlation of quality and process parameters, evaluation of known or suspected causes of process failures (batches outside the specification)
  - Determination of processes with potential for improvement through in-process control
  - Characterization of the tasks for in-process control
  - Evaluation of known/potential online or inline analysis methods and analyzers for the in-process controls; assessment on the basis of data from corresponding offline and online laboratory methods
- Extra services (separate charge):
  - Siemens examines a selection of in-house process analysis systems for suitability for the real-time process analysis
  - Execution in own laboratories with samples of varying quality
  - Invoicing of analysis performed by Siemens on pro rata basis
- Result: Documentation of the feasibility study with concluding evaluation of the PAT potential and specific recommendations for further actions

Module 3: Implementation of the prepared feasibility study

- Implementation of knowledge gained in Modules 1 and 2 in a specific project for supporting the PAT implementation
- Content is the subject of an individual agreement between client and contractor
- Typical service content:
  - Risk analysis
  - Support in selecting and installing a process analysis system
  - Support in drawing up the "Design of Experiment" (DoE) and execution of the experiments for structured investigation of the "Design Space"
  - Data analysis, e.g. multivariate (MVDA)
  - Interpretation of the results
  - Process optimization on the basis of the understanding gained of the process and, if necessary, modification of the "design space"
- Basis for the individual agreement is a project-specific quotation provided by Siemens as the contractor
- Inquiries for production of a quotation should be directed to the address specified under "Further information"

Note:
The modules of the Premium Service SIMATIC SIPAT do not include any traveling expenses. Traveling expenses from the Hoechst Industrial Estate, Frankfurt am Main, Germany, will be invoiced separately.

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Advanced Process Control (APC) is an effective lever for improving product quality and increasing productivity, profitability and the environmental sustainability of production plants in the process industry.

Established control concepts in the process industry today still rely predominantly on PID controllers. When automation reaches its limits, it is necessary to resort to manual intervention by the plant operator. However, using APC methods that can mathematically describe even complicated relationships of process parameters, considerably better results can often be achieved.

APC enables unwanted fluctuations of process variables to be reduced and thus enables setpoint values to be maintained closer to critical secondary conditions (constraint pushing), without violating these limits. While this reduces the work for the operating personnel, it also enables throughput and product quality to be improved and a noticeable reduction in the use of raw materials and energy consumption.

In the control libraries of SIMATIC PCS 7 the following function blocks and templates are already available for higher-level control functions at no extra cost:

- Gain scheduling
- Override control
- Lead-lag/lead-forward control
- PID controller optimization (PCS 7 PID Tuning)
- Control performance monitoring
- Smith Predictor
- Model-based predictive multi-variable control

Further high-quality closed-loop control functions can be seamlessly integrated as add-on products into the SIMATIC PCS 7 process control system (for details, see Chapter "Advanced Process Control"):

- FuzzyControl++
- Soft sensors (INCA Sensor)
- Model-predictive multi-variable controller (INCA MPC)
- Extended PID controller optimization (INCA PID Tuner)
- Adaptive controller (ADCO)

Supplementary to this, Siemens offers extensive services for implementing APC solutions with the "Premium Service Advanced Process Control"

- Technical consultation
- Experimental examinations
- Implementation of APC functions

These services are particularly aimed at customers from the pharmaceutical and chemical industry as well as the food and beverages industry.

**Benefits**

- Consultation, engineering and implementation from a single source
- Control system-integrated implementation with standard function blocks
- Optimization of the operation of process engineering processes:
  
  **Productivity and economy**
  - Increased throughput (typically 1 to 5 %)
  - Minimization of energy use (typically 3 to 10 %)
  - Reduction of down times
  - Increased productivity (typically 2 to 10 %)
  - Shorter throughput times

- Quality
  - Improved reproducibility of plant operating methods
  - Minimizing the fluctuation of quality parameters
  - Reducing the expenditure on analysis

- Flexibility and availability
  - Greater tolerance to fluctuations in raw materials
  - Increased robustness and reduced sensitivity to interference
  - Extension of the plant life

- Ease of operation
  - Reduced workload for personnel
  - More convenient operation
  - Change of operators not quality-relevant

- Environmental protection
  - Minimization of waste material
  - Reduction of emissions
  - Less waste water

**Application**

The services of the Premium Service "Advanced Process Control" are mainly suitable for:

- Production processes in the chemical and pharmaceutical industry and in the food and beverage industry
- Optimization of the automation systems of process engineering processes
- Evaluation and migration of existing automation systems and configuration of new plants

They are of particular advantage for processes with:

- Difficult control routes, e.g. with long reaction times
- Unpredictable disturbance of process variables
- Reciprocal action between different process variables
- Frequent load changes and transitions between the work points
- Unfavorable basic automation, e.g. poorly adjusted PI/PID controllers
Process Services
Premium Services for process optimization

Premium Service "Advanced Process Control"

Design

The Premium Service Advanced Process Control is split into three complementary modules that can be ordered individually:

Module 1: Determination of the APC optimization potential through analysis by experts

- One-day Workshop for analyzing the customer’s production processes and process automation with the aim of determining process variables for the optimization by means of conventional and superior closed-loop control methods
- Participants: Siemens experts and representatives of the client with profound knowledge of the process and its automation
- Prior agreement of workshop details between client and contractor, e.g. on the basis of a target-oriented specification
- Where necessary, the client provides the required basic material for the workshop, e.g. flowcharts and descriptions of the production process
- Typical workshop content:
  - Examination of the process engineering, focusing on economically relevant process variables that can be optimized
  - Analysis of the basic automation
  - Consideration of conventional closed-loop control procedures and potential APC methods
  - Determining the customer benefit
- Result: Workshop documentation with evaluation of the APC potential and specific recommendations for further actions

Module 2: Preparation of a feasibility study

- Approx. one week feasibility study for verification and detailing of the optimization potential identified in Module 1:
  - Substantiated analysis of the identified optimization candidates
  - Preparation of optimization options
- Participants: Siemens experts and representatives of the client
- Prerequisites:
  - Basic automation, closed-loop control concept and instrumentation comply with the current state of the art
  - Detailed information is available about the processes considered and their method of operation
  - Access to the customer’s process control system is possible, e.g. for recording data of relevant process variables during operation
- Inclusive services:
  - Preparation of process expertise, e.g. by tracking the reactions to targeted minimal interventions in the process or by exchanging experiences with the plant operators
  - Examination of the current closed-loop control concept for optimization potential
  - Presentation of suggestions for actual optimization measures
  - Assessment of the suggested optimization measures
  - Cost estimation of the implementation with an accuracy of ±25%
  - Basic deadlines for implementation of measures
- Result: Documentation of the feasibility study with qualitative and financial evaluation of possible optimization measures and specific recommendations for further actions

Module 3: Implementation of the prepared feasibility study

- Implementation of the optimization measures recommended in Module 2
- Content is the subject of an individual agreement between client and contractor
- Typical service content:
  - Plant tests and model creation
  - APC implementation in the process control system
  - Commissioning
  - Training
  - Involvement in the validation in a field regulated by GMP (good manufacturing practice)
- Basis for the individual agreement is a project-specific quotation provided by Siemens as the contractor
- Inquiries for production of a quotation should be directed to the address specified under "Further information"

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Industrial Automation Systems
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You can find additional information on the Internet at:
www.siemens.de/ec

Note:
The modules of the Premium Service "Advanced Process Control" do not include any traveling expenses. Traveling expenses from the Hoechst Industrial Estate, Frankfurt am Main, Germany, will be invoiced separately.
Overview

Asset management has become enormously important due to the intensive global competition and the associated cost pressure in many areas of the process industry.

The aim of all asset management activities is to increase the life of the system components of a plant (assets) and thus the reliability and availability of the overall plant and also to optimize the maintenance measures necessary for this.

While the significance of status-dependent maintenance continues to increase, the failure-oriented and preventive maintenance strategies that were common in the past are fading into the background.

Operating errors, malfunctions or symptoms of wear can be detected at an early stage by means of:
- Online recording and evaluation of operating states and switching processes
- Comparison of operating point and standard characteristics of a piece of apparatus

Moreover, on the basis of long-term statistical evaluations it is possible to determine whether an apparatus is optimally designed.

Using a maintenance station integrated in SIMATIC PCS 7, assets of the control system can be monitored and their diagnostics messages and maintenance requirements can be processed.

Regardless of this, individual asset management blocks are offered as add-on products for the SIMATIC PCS 7 process control system; enabling the maintenance engineer to monitor passive (indirect) assets. These are CFC blocks that run on an automation system. One example of this is the condition monitoring block PumpMon in the Chapter "Libraries/Blocks/Tools". Additional asset management blocks of this type are currently being prepared, e.g. for heat exchangers and control valves.

In the context of these asset management blocks, Siemens, with its Premium Service Asset Management, offers extensive consultation services for the maintenance engineer as well as support during commissioning.

The Siemens experts employed for this purpose have process-engineering expertise and are experienced in the design and optimization of assets. They are familiar not only with automation systems but also with maintenance requirements.

The Asset Management Premium Service is of particular interest for continuous production plants as well as for new plants where no experience is yet available for the planning of maintenance intervals. Here the main focus is on "failure-critical" apparatus that requires fixed maintenance intervals due to severe wear.

Note:
A prerequisite for the use of the Asset Management Premium Service is the use of a SIMATIC PCS 7 process control system V7.0 or higher.
**Design**

The Premium Service Asset Management offered as an add-on for SIMATIC PCS 7 as of V7.0 process control system is split into three complementary modules that can be ordered individually:

**Module 1:**
**Determination of asset management optimization potential through analysis by experts**
- One-day workshop for explanation of the Siemens integrated asset management concept, for determining the need for maintenance and the optimization potential
- Participants: Siemens experts and representatives of the client with profound knowledge of the plant technology and asset management.
- Prior agreement of workshop details between client and contractor
- Typical workshop content:
  - Presentation of the available asset management blocks
  - Stating the requirements for the application of the asset management blocks, e.g. suitable types of apparatus, retrofitting of measurement devices etc.
  - Explanation of the block functions, if necessary in connection with a live demonstration
  - Presentation of the benefits and limits of asset management blocks
  - Presentation of the customer's current maintenance situation (maintenance intervals, failure/wear problems, frequency of plant standstills)
  - Basic analysis to determine the optimization potential
- Result: Workshop documentation with qualitative evaluation of the asset management potential and specific recommendations for further actions

**Module 2:**
**Preparation of a feasibility study**
- Approx. one week feasibility study for verification and detailing of the potential identified in Module 1: Detailed examination of the assets of the customer plant and recording of the process/apparatus data relevant for the parameterization
- Participants: Siemens experts and representatives of the client
- Prior agreement of content of the feasibility study between client and contractor
- Typical contents of the feasibility study:
  - Selection of assets to be monitored
  - Checking the conditions for applying the asset management blocks
  - Determining the necessary measurement technology
  - Recording relevant process/apparatus data in the form of checklists
  - Determining the required alarms
- Result: Report on the feasibility study that contains the data on assets to be monitored, necessary commissioning measures and a rough estimate of costs

**Module 3:**
**Implementation of the prepared feasibility study**
- Support in commissioning the asset management blocks
- Requirement: Completion of the measures necessary for the commissioning of the asset management blocks from the feasibility study, e.g. retrofitting of measurement points
- Content is the subject of an individual agreement between client and contractor
- Typical service content:
  - Calculating the characteristics
  - Implementing and parameterizing the blocks
  - Analysis of the recorded block operating data
  - Training the customer’s personnel
- Basis for the individual agreement is a project-specific quotation provided by Siemens as the contractor
- Inquiries for production of a quotation should be directed to the address specified under "Further information"

**Note:**
The modules of the Premium Service 'Asset Management' do not include any traveling expenses. Traveling expenses from the Hoechst Industrial Estate, Frankfurt am Main, Germany, will be invoiced separately.

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**Selection and ordering data**

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<td>6DL5 701-8AF00-0XD0</td>
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K: Subject to export regulations AL: N and ECCN: EAR99T

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**More information**

Siemens AG
Industry Sector
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S7 SmartLabel: Generation of I/O labeling strips
Overview

**S7-SmartLabel:**
*Generation of I/O labeling strips*

**PCS 7 Add-on:** fit for SIMATIC PCS 7 V7

S7-SmartLabel is an independent software program that enables labels to be generated and printed automatically for all central and distributed I/O modules of an automation plant, based on the configuration data of a SIMATIC PCS 7 project. S7-SmartLabel is also capable of printing symbolic names and logical addresses. This applies to Siemens components as well as to PROFIBUS components from other suppliers.

**Note**

S7-SmartLabel can be used together with SIMATIC PCS 7 V6 and V7.

**Benefits**

- Addresses, symbolic names and other data (e.g. resource codes or slots) do not have to be edited individually for the printout, but can be taken directly from the SIMATIC PCS 7 project.
- This achieves 90% time savings over manual creation of labels, recouping the costs after just one day
- Potential editing errors are eliminated
- Printout on different media: paper, transparencies or label sheets
- Perforated label sheets avoid the time-consuming cutting of the individual labels
- Support in the generation of new module layouts
- Brand labeling: You can also integrate your company logos
- Support of all Microsoft Windows-compatible printers
- Software and layout templates can be downloaded from the Internet

**Function**

A SIMATIC PCS 7 project already contains all the data for labeling the modules.

You do not have to copy, import, export or edit any other data. S7-SmartLabel adopts addresses, symbolic names and other data (e.g. resource identifiers or slot) directly from the SIMATIC PCS 7 project. S7-SmartLabel then assigns the associated data to the configured I/O modules. Using this information, the module-specific labeling strips are created and output “with pinpoint precision” on a printer that is calibrated by S7-SmartLabel. After they have been peeled off or cut out, the labeling strips are inserted in the slots provided on the front of the modules, if necessary with additional transparent strips of film (colored).

S7-SmartLabel supports various print media:

- Pre-perforated label sheets
- White or colored DIN A4 paper
- DIN A4 transparent film

**Selection and ordering data**

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**Label sheets**

- Centralized I/O for SIMATIC PCS 7
- Distributed I/O for SIMATIC PCS 7

See under Accessories in chapter “S7-400” of Catalog ST 70
See the respective distributed I/O modules in the chapter “Distributed I/O” of Catalog IK PI

**J:** Subject to export regulations AL: N and ECCN: EAR99S

**More information**

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Additional information is available on the Internet at:

www.siemens.de/s7-smartlabel
At Siemens Industry Automation and Drive Technologies, more than 85,000 people are resolutely pursuing the same goal: long-term improvement of your competitive ability. We are committed to this goal. Thanks to our commitment, we continue to set new standards in automation and drive technology. In all industries – worldwide.

At your service locally, around the globe for consulting, sales, training, service, support, spare parts ... on the entire Industry Automation and Drive Technologies range.

Your personal contact can be found in our Contacts Database at: www.siemens.com/automation/partner

You start by selecting a
- Product group,
- Country,
- City,
- Service.
Siemens Industry Automation and Drive Technologies in the WWW

A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

Siemens Industry Automation and Drive Technologies has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address www.siemens.com/industry

you will find everything you need to know about products, systems and services.

Product Selection Using the Interactive Catalog CA 01 of Industry

Detailed information together with convenient interactive functions:

The interactive catalog CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Industry Automation and Drive Technologies product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.

All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the interactive catalog CA 01 can be found in the Internet under www.siemens.com/automation/ca01

or on DVD.

Easy Shopping with the Industry Mall

The Industry Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the Industry Mall on the Internet under:

www.siemens.com/industrymall
For machine constructors, solution providers and plant operators: The service offering from Siemens Industry, Automation and Drive Technologies includes comprehensive services for a wide range of different users in all sectors of the manufacturing and process industry.

To accompany our products and systems, we offer integrated and structured services that provide valuable support in every phase of the life cycle of your machine or plant - from planning and implementation through commissioning as far as maintenance and modernization.

Our Service & Support accompanies you worldwide in all matters concerning automation and drives from Siemens. We provide direct on-site support in more than 100 countries through all phases of the life cycle of your machines and plants.

You have an experienced team of specialists at your side to provide active support and bundled know-how. Regular training courses and intensive contact among our employees - even across continents - ensure reliable service in the most diverse areas.

**Online Support**

The comprehensive online information platform supports you in all aspects of our Service & Support at any time and from any location in the world.

[www.siemens.com/automation/service&support](http://www.siemens.com/automation/service&support)

**Technical Consulting**

Support in planning and designing your project: From detailed actual-state analysis, definition of the goal and consulting on product and system questions right through to the creation of the automation solution.

**Technical Support**

Expert advice on technical questions with a wide range of demand-optimized services for all our products and systems.

[www.siemens.com/automation/support-request](http://www.siemens.com/automation/support-request)

**Training**

Extend your competitive edge - through practical know-how directly from the manufacturer.

[www.siemens.com/sitrain](http://www.siemens.com/sitrain)

Contact information is available in the Internet at:

[www.siemens.com/automation/partner](http://www.siemens.com/automation/partner)
Engineering Support
Support during project engineering and development with services fine-tuned to your requirements, from configuration through to implementation of an automation project.

Field Service
Our Field Service offers you services for commissioning and maintenance - to ensure that your machines and plants are always available.

Spare parts
In every sector worldwide, plants and systems are required to operate with constantly increasing reliability. We will provide you with the support you need to prevent a standstill from occurring in the first place: with a worldwide network and optimum logistics chains.

Repairs
Downtimes cause problems in the plant as well as unnecessary costs. We can help you to reduce both to a minimum - with our worldwide repair facilities.

Optimization
During the service life of machines and plants, there is often a great potential for increasing productivity or reducing costs. To help you achieve this potential, we are offering a complete range of optimization services.

Modernization
You can also rely on our support when it comes to modernization - with comprehensive services from the planning phase all the way to commissioning.

Service programs
Our service programs are selected service packages for an automation and drives system or product group. The individual services are coordinated with each other to ensure smooth coverage of the entire life cycle and support optimum use of your products and systems. The services of a Service Program can be flexibly adapted at any time and used separately.

Examples of service programs:
- Service contracts
- Plant IT Security Services
- Life Cycle Services for Drive Engineering
- SIMATIC PCS 7 Life Cycle Services
- SINUMERIK Manufacturing Excellence
- SIMATIC Remote Support Servicess

Advantages at a glance:
- Reduced downtimes for increased productivity
- Optimized maintenance costs due to a tailored scope of services
- Costs that can be calculated and therefore planned
- Service reliability due to guaranteed response times and spare part delivery times
- Customer service personnel will be supported and relieved of additional tasks
- Comprehensive service from a single source, fewer interfaces and greater expertise

Contact information is available in the Internet at: www.siemens.com/automation/partner
Knowledge Base on DVD

For locations without online connections to the Internet there are excerpts of the free part of the information sources available on DVD (Service & Support Knowledge Base). This DVD contains all the latest product information at the time of production (FAQs, Downloads, Tips and Tricks, Updates) as well as general information on Service & Support. The DVD also includes a full-text search and our Knowledge Manager for targeted searches for solutions. The DVD will be updated every 4 months.

Just the same as our online offer in the Internet, the Service & Support Knowledge Base on DVD comes complete in 5 languages (German, English, French, Italian, Spanish).

You can order the Service & Support Knowledge Base DVD from your Siemens contact.

Order no. 6ZB5310-0EP30-0BA2

Automation Value Card

Small card - great support

The Automation Value Card is an integral component of the comprehensive service concept with which Siemens Automation and Drives will accompany you in each phase of your automation project.

It doesn’t matter whether you want just specific services from our Technical Support or want to purchase something on our Online portal, you can always pay with your Automation Value Card. No invoicing, transparent and safe. With your personal card number and associated PIN you can view the state of your account and all transactions at any time.

Services on card. This is how it’s done.

Card number and PIN are on the back of the Automation Value Card. When delivered, the PIN is covered by a scratch field, guaranteeing that the full credit is on the card.

By entering the card number and PIN you have full access to the Service & Support services being offered. The charge for the services procured is debited from the credits on your Automation Value Card.

All the services offered are marked in currency-neutral credits, so you can use the Automation Value Card worldwide.

Order your Automation and Value Card easily and comfortably like a product with your sales contact.

Detailed information on the services offered is available on our Internet site at:

www.siemens.com/automation/service&support

Service & Support à la Card: Examples

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Technical Support

- "Priority" Priority processing for urgent cases
- "24 h" Availability round the clock
- "Extended" Technical consulting for complex questions
- "Mature Products" Consulting service for products that are not available any more

Support Tools in the Support Shop

Tools that can be used directly for configuration, analysis and testing.
Solution Partner: Highest quality - guaranteed
The products and systems from Siemens Industry Automation and Drive Technologies offer the ideal platform for all automation applications.

Under the name of Siemens Solution Partner Automation, selected system integrators around the world act as uniformly qualified solution providers for the Siemens range of products and services in the fields of automation and drives. Day after day, they utilize their qualified product and system know-how as well as their excellent industry expertise to your advantage – for all requirements.

The partner emblem is the guarantee and indicator of proven quality. The basis for this are defined quality features that identify Solution Partners as reliable and competent solution providers:

- **Solution quality**
  Always a good result with tried and tested solutions expertise.

- **Expert quality**
  Certified technical competence ensures maximum efficiency.

- **Project quality**
  With proven project experience straight to the target.

- **Portfolio quality**
  Comprehensive portfolio for state-of-the-art solutions from a single source.

The Siemens Solution Partner Program helps you to find the optimum partner for your specific requirements.

Support is provided by the Solution Partner Finder, a comprehensive online platform that showcases the profiles of all our solution partners. You can convince yourself of the competence of the respective Solution Partner by means of the references provided. Various search criteria are available for this purpose.

Once you have located a partner, you are only one small step away from contacting them.

Find the right partner here for your specific task and convince yourself of the solution competence provided:

http://www.siemens.com/automation/partnerfinder

Additional information on the Siemens Solution Partner Program is available online at:

http://www.siemens.com/automation/solutionpartner
Software Licenses

Overview

Software types
Software requiring a license is categorized into types. The following software types have been defined:
- Engineering software
- Runtime software

Engineering software
This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.
Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

Runtime software
This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.
The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.
You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.
Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery can be found in the readme file supplied with the relevant product(s).

License types
Siemens Industry Automation & Drive Technologies offers various types of software license:
- Floating license
- Single license
- Rental license
- Trial license

Floating license
The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.
A license is required for each concurrent user.

Single license
Unlike the floating license, a single license permits only one installation of the software.
The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per device, per axis, per channel, etc.
One single license is required for each type of use defined.

Rental license
A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific number of hours (the operating hours do not have to be consecutive).
One license is required for each installation of the software.

Trial license
A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Factory license
With the Factory License the user has the right to install and use the software at one permanent establishment only. The permanent establishment is defined by one address only. The number of hardware devices on which the software may be installed results from the order data or the Certificate of License (CoL).

Certificate of license
The Certificate of License (CoL) is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading
The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Delivery versions
Software is constantly being updated.
The following delivery versions
- PowerPack
- Upgrade
can be used to access updates.
Existing bug fixes are supplied with the ServicePack version.

PowerPack
PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade
An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.
The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.
A separate upgrade must be purchased for each original license of the software to be upgraded.

ServicePack
ServicePacks are used to debug existing products.
ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key
Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.
The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).
The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).
Detailed explanations concerning license conditions can be found in the "Terms and Conditions of Siemens AG" or under http://www.siemens.com/industrymall (Industry Mail Online-Help System)
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