Add-ons for the SIMATIC PCS 7 Process Control System
Catalog ST PCS 7.1 • 2010

SIMATIC PCS 7
Answers for industry.
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SIMATIC PCS 7
Add-ons for the SIMATIC PCS 7 Process Control System

Catalog ST PCS 7.1 · 2010

Supersedes:
Catalog ST PCS 7.1 · June 2008

The products contained in this catalog can also be found in the e-Catalog CA 01.
Order No.:
E86060-D4001-A500-C8-7600

Please contact your local Siemens branch

© Siemens AG 2010
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 is the only provider of an integrated basis for 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 in buildings requires integrated solutions. Our response: Totally Integrated Power. This means innovative and integrated, interface-optimized products and systems which have been optimally coordinated and complemented with communication and software modules that link power distribution to building automation or industrial automation. Totally Integrated Power accompanies power distribution projects from one end to the other. From A to Z. From the planning to the building’s use: Totally Integrated Power offers significant advantages in every project stage and to everyone involved in the project – the investors, electrical planning engineers, electricians, users and building facility managers.

Our portfolio comprises everything from engineering tools to the matching hardware: from switchgear and distribution systems for medium voltage to transformers, from switching and circuit-protection devices to low-voltage switchgear and busbar trunking systems, as far as to the small distribution board and the wall outlet. It goes without saying that both the medium-voltage switchgear, which requires no maintenance, and the low-voltage switchgear are type-tested, and their busbar connections, too. Comprehensive protection systems ensure the safety of man and machine at any time.
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:

Internet

The Catalog ST PCS7.1 can also be downloaded as a PDF file from the Internet.

The Information and Download Center of Siemens Industry Automation and Drive Technologies can be accessed from the SIMATIC PCS 7 web site or at: www.siemens.com/simatic/printmaterial

Additional information is available on the SIMATIC PCS 7 web site on the Internet at: www.siemens.com/simatic-pcs7
Much more than a catalog. The Industry Mall.

You have a catalog in your hands that will serve you well for selecting and ordering your products. But have you heard of the electronic online catalog (the Industry Mall) and all its benefits? Take a look around it sometime:

www.siemens.com/industrymall

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.

**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.
apenOne-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.

More information

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Fax: +49 621 456-3334
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You can find additional information in the Internet at:
www.siemens.com/mis-PCS7
Information and Management Systems

PCS 7 OCS: Open interface for connection of third-party applications

Overview

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.

Application

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

Design

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 V2.3**
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), 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

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<th>SIMATIC PCS 7 OCS V2.3</th>
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<td>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), 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</td>
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**SIMATIC PCS 7 OCS update**
Expansion of open communication server for SIMATIC PCS 7, V7.0 and higher
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”
On request from LeiKon GmbH

**More Information**

LeiKon GmbH
Kaiserstr. 100
52134 Herzogenrath
Germany

Phone: +49 2407 95 17 330
Fax: +49 2407 95 17 339
E-mail: contact@leikon.de

Additional information is available in the Internet under: www.leikon.de
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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EMSR-Ingenieurgesellschaft m.b.H.
Elektro-Mess-Regel-Steuerungs-Technik
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84489 Burghausen
Germany
Phone: +49 8677 884-725 (Mr. Fröhlich)
E-mail: Support: support.plsdoc@fi-wa.com
Information: info.plsdoc@fi-wa.com

Additional information is available in the Internet under: www.fi-wa.com
Overview

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.

Design

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

Design

ACRON evaluation | External evaluation
---|---
Reporter | Microsoft Excel
Graph1 | SAP
Alert | OPC server
OCX | ODBC server
Provider | Maintenance and servicing
Configuration | Process values
Data recording | Laboratory values
Compressed, calculated data | Manual values

ACRON evaluation

- **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

VIDEC GmbH
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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.

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.

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

You can find additional information in the Internet at:
www.versiondog.de
### Advanced Process Control

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</table>
Advanced Process Control

INCA MPC:
Model-predictive multi-variable controller

Overview

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

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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

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.

More information

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Overview

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.

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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.

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

<table>
<thead>
<tr>
<th>ADCO</th>
<th>SIMATIC PCS 7 V6.x or higher with AS 41x automation systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware requirements</td>
<td></td>
</tr>
<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>

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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

MATLAB/SIMULINK-DDE client: Online coupling for APC

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
- 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 “Adde” 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

| Order No. | 2XV9 450-1WC12-0LA0 | C) Subject to export regulations: AL: N, ECCN: EAR99S |

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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.
### Selection and Ordering Data

<table>
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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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<tr>
<td>Configuration tool, executes with Windows 2000 and XP, 2 languages (German, English), including MPI license, S7 blocks for one application, manual Engineering software, software class A</td>
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<td>Type of delivery: Software on CD/DVD and license key</td>
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<td><strong>FuzzyControl++ PCS 7 package</strong></td>
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<tr>
<td>CFC runtime module with face-plates for SIMATIC PCS 7 V7.0 + SP1 and higher</td>
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<td>Runtime software, software class A</td>
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<td>Type of delivery: Software on CD/DVD and license key</td>
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<tr>
<td><strong>FuzzyControl++ S7 and CFC copying license for further data blocks</strong></td>
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<td><strong>FuzzyControl++ communications package</strong> for loading the blocks and online monitoring via the PCS 7 Industrial Ethernet plant bus</td>
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<tr>
<td><strong>FuzzyControl++ CFC package</strong> with blocks and faceplate for PCS 7 V6</td>
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<td>Type of delivery: Certificate of License</td>
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C) Subject to export regulations: AL: N, ECCN: EAR99S

### More information

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Advanced Process Control

NeuroSystems: Configuration tool for neural networks

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

<table>
<thead>
<tr>
<th>NeuroSystems for SIMATIC PCS 7 V7 (V7.1 or V7.0 + SP1 and higher)</th>
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<tr>
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<td>Configuration tool for creating and testing neural networks under Windows 2000 and XP, two languages (German, English), including online help and manual as well as runtime module for SIMATIC S7, MPI registration for downloading the blocks and for online monitoring via MPI and S7 blocks (FBs) for one application</td>
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<td>Type of delivery: Software on CD/DVD and license key</td>
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<tbody>
<tr>
<td>CFC runtime module with faceplates for one application, SIMATIC PCS 7 V7.0 + SP1 and higher</td>
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### More information

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

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

#### Telecontrol
- **SIMATIC PCS 7 TeleControl:** Integration of widely distributed outstations
- **PCS 7 TeleControl Engineering Station**
- **PCS 7 TeleControl Operator System**

#### Telecontrol - SINAUT ST7
- **SINAUT ST7 telecontrol system**

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

#### 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

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).
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).

Selection and Ordering Data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6DL5436-8AX17-0XA0</td>
<td>CEMAT OSENG V7.1, Engineering software, software class A, 2 languages (German, English), executes with Windows Server 2003/XP Professional, single license for 1 installation Type of delivery: software and documentation on DVD, license key memory stick, certificate of license</td>
</tr>
<tr>
<td>6DL5438-8AA17-0XA0</td>
<td>CEMAT OSRT3 V7.1 (3 AS), 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 Type of delivery: software and documentation on DVD, license key memory stick, certificate of license</td>
</tr>
<tr>
<td>6DL5435-8AX17-0XA0</td>
<td>CEMAT MC V7.1, OS software Client Runtime, software class A, 2 languages (German, English), executes with Windows XP Professional, single license for 1 installation Type of delivery: software and documentation on DVD, license key memory stick, certificate of license</td>
</tr>
<tr>
<td>6DL5433-8AA17-0XA0</td>
<td>CEMAT RSRT3 V7.1 (3 AS), 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 Type of delivery: software and documentation on DVD, license key memory sticks, certificate of license</td>
</tr>
<tr>
<td>6DL5433-8AB17-0XA0</td>
<td>CEMAT RSRT6 V7.1 (6 AS), 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 Type of delivery: software and documentation on DVD, license key memory sticks, certificate of license</td>
</tr>
<tr>
<td>6DL5433-8AC17-0XA0</td>
<td>CEMAT RSRT9 V7.1 (9 AS), 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 Type of delivery: software and documentation on DVD, license key memory sticks, certificate of license</td>
</tr>
<tr>
<td>6DL5433-8AD17-0XA0</td>
<td>CEMAT RSRTU V7.1 (unlimited AS), 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 Type of delivery: software and documentation on DVD, license key memory sticks, certificate of license</td>
</tr>
<tr>
<td>6DL5430-8AX17-0XE0</td>
<td>CEMAT Software Upgrade V7.1, for upgrading existing CEMAT installations V6.1 and higher Engineering and runtime software, software class A, 2 languages (German, English), executes with Windows XP Professional/Server 2003, single license for 1 installation Type of delivery: software and documentation on DVD, license key memory stick for WinCC User Archive Upgrade, certificate of license Can only be used together with a valid CEMAT license.</td>
</tr>
</tbody>
</table>
Industry-specific applications

Cement industry

CEMAT: Software for the cement industry

Selection and Ordering Data

CEMAT V7.0 software packages

CEMAT OSENG V7.0
Engineering software, software class A, 2 languages (German, English), executes with Windows Server 2003/XP Professional, single license for 1 installation
Type of delivery: software and documentation on DVD, license key disk, certificate of license

Order No. 6DL5 436-8AX07-0XA0

CEMAT OS software for single station incl. AS runtime licenses (PLC)

CEMAT OSRT3 V7.0 (3 AS)
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
Type of delivery: software and documentation on DVD, license key disk, certificate of license

Order No. 6DL5 434-8AA07-0XA0

CEMAT OS software for client

CEMAT MC V7.0
OS software Client Runtime, software class A, 2 languages (German, English), executes with Windows XP Professional, single license for 1 installation
Type of delivery: software and documentation on DVD, license key disk, certificate of license

Order No. 6DL5 435-8AX07-0XA0

CEMAT OS software for redundant pair of servers incl. AS runtime licenses (PLC)

CEMAT RSRT3 V7.0 (3 AS)
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
Type of delivery: software and documentation on DVD, 2 license key disks, certificate of license

Order No. 6DL5 433-8AA07-0XA0

CEMAT RSRT6 V7.0 (6 AS)
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
Type of delivery: software and documentation on DVD, 2 license key disks, certificate of license

Order No. 6DL5 433-8AB07-0XA0

CEMAT RSRT9 V7.0 (9 AS)
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
Type of delivery: software and documentation on DVD, 2 license key disks, certificate of license

Order No. 6DL5 433-8AC07-0XA0

CEMAT RSRTU V7.0 (unlimited AS)
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
Type of delivery: software and documentation on DVD, 2 license key disks, certificate of license

Order No. 6DL5 433-8AD07-0XA0

CEMAT OS PowerPacks for redundant pair of servers

CEMAT OS PowerPack V7.0 for expansion of the AS runtime licenses
Software class A, 2 languages (German, English), executes with Windows Server 2003, single license for 2 installations
Type of delivery: software and documentation on DVD, license key disks, certificate of license

- CEMAT PRSRT6 V7.0 for expansion from 3 to 6 AS
- CEMAT PRSRT9 V7.0 for expansion from 6 to 9 AS
- CEMAT PRSRTU V7.0 for expansion from 9 to unlimited AS

Order No. 6DL5 433-8AB07-0XD0

Order No. 6DL5 433-8AC07-0XD0

Order No. 6DL5 433-8AD07-0XD0

More information

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Additional information is available on the Internet at:
www.siemens.com/cemat
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.
Industry-specific applications
Cement industry

ECS/CemScanner: Monitoring of temperature in kiln jacket

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/stopping 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

More information
FLSmidth Automation
Phone: +45 3618 2700
Fax: +45 3618 2799
E-mail: flsa@flsautomation.com
Additional information is available in the Internet under:
www.flsautomation.com
**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**

FLSmidth Automation
Phone: +45 3618 2700
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Additional information is available in the Internet under:

www.flsautomation.com
Industry-specific applications

Telecontrol

SIMATIC PCS 7 TeleControl: Integration of widely distributed outstations

Overview

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 (RTU) 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 to directly integrate the telecontrol center for the outstations into the process control system for the central areas of the plant. The superimposed integration level will become superfluous.

The SIMATIC PCS 7 TeleControl V7.1 products are suitable for integration of the telecontrol center into the process control and engineering of the SIMATIC PCS 7 V7.1 process control system. They support the linking of outstations in different manners (see graphic "Integration and communication options with SIMATIC PCS 7 TeleControl V7.1" and table "Current connection possibilities for widely distributed TeleControl outstations").

As far as the scope and performance of the automation functions are concerned, the requirements of the widely distributed plant sections are usually in the bottom to mid range, which means you can use automation stations of reduced dimensions for the outstations. SIMATIC PCS 7 TeleControl V7.1 particularly supports the following outstations for distributed automation on site:

- **Controller integrated in SIMATIC ET 200S**
  with the telecontrol protocols Modbus, IEC 870-5-101 and IEC 870-5-104; for cost-sensitive applications, up to ca. 200 information points

- **SIMATIC S7-300/S7-300F controller**
  with the telecontrol protocols SINAUT ST7, Modbus, IEC 870-5-101 and IEC 870-5-104; extremely flexible configuration, up to ca. 2,000 information points (with S7-317)

- **SIMATIC S7-400/S7-400F controller**
  with the telecontrol protocols SINAUT ST7, Modbus, IEC 870-5-101 and IEC 870-5-104; up to ca. 5,000 information points (with S7-416)

In the catalog sections "SINAUT ST7 telecontrol system" and "SIPLUS RIC telecontrol system" you can find information on the various telecontrol protocols, low-cost RTU bundles, possible operating modes, and special telecontrol configurations.

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

- SIMATIC PCS 7 TeleControl V7.1 cannot only integrate newly configured telecontrol outstations into SIMATIC PCS 7 V7.1, it can also migrate plant sections which already exist outdoors per Modbus or S7 EDC drivers.
- 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 homogeneous 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 while observing conformity with SIMATIC PCS 7 V7.1 at the same time. DBA considerably facilitates project-specific adaptation of the system and importing of existing configurations during migration. Extensions can be added during plant operation.

Application

Remote control and monitoring of distributed stations, data acquisition and transmission, e.g. in the industries:

- Water/wastewater
  - Well, pumping and sluice stations in water supply networks
  - Storm-water tanks and siphon stations in wastewater networks
- Oil/gas
  - Compression, pressure reduction, transfer and measuring 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
- Power, environment, transportation
  - Equipment for power generation and distribution
  - District heating
  - Traffic control systems
  - Tunnels
  - Railway stations

Design

The telecontrol center for the outstations (RTU) 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 used 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 telecontrol systems (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 outstations, SIMATIC PCS 7 TeleControl V7.1 uses the protocols SINAUT ST7 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).

Serial interfacing of the outstations is possible at low cost using SINAUT TIM communication modules (SINAUT ST7 telecontrol protocol) or TCP/IP serial converters (Modbus/IEC 870-5-101 telecontrol protocols) connected directly to the PCS 7 TeleControl OS (single station or server). Equipment from MOXA or Lantronix, for example, can be used as TCP/IP serial converters.

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 (telecontrol protocols SINAUT ST7/Modbus/IEC 870-5-104).

The following table shows the current connection possibilities depending on the type of outstation and type of communication.
Industry-specific applications

Telecontrol

SIMATIC PCS 7 TeleControl: Integration of widely distributed outstations

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>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>
</tr>
<tr>
<td><strong>Interface on the PCS 7 TeleControl OS</strong></td>
<td>TIM 4R-IE</td>
<td>TCP/IP WAN router or/and TIM 4R-IE</td>
<td>TCP/IP serial converter</td>
<td>TCP/IP WAN router</td>
</tr>
<tr>
<td><strong>RTU/ interface</strong></td>
<td>S7-300/ S7-300F (SINAUT ST7)</td>
<td>TIM 3V-IE</td>
<td>TIM 3V-IE</td>
<td>CP 341</td>
</tr>
<tr>
<td></td>
<td>S7-400/ S7-400F (SINAUT ST7)</td>
<td>TIM 4R-IE</td>
<td>TIM 4R-IE</td>
<td>CP 441</td>
</tr>
<tr>
<td>ET 200S with integral CPU (corresponds to S7-314)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>DP master module + 1 SI Modbus module + IM 151-7 CPU or IM 151-8 PN/DP CPU</td>
</tr>
<tr>
<td><strong>Third-party station</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Depends on type of station</td>
</tr>
<tr>
<td><strong>Dialup lines</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Dedicated lines and radio networks</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Master-slave</strong></td>
<td>–</td>
<td>–</td>
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<tr>
<td><strong>Peer-to-peer</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Mesh networks</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Time tagging in RTU</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>RTU time synchronization</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Data buffering in RTU</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>International standard</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

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

Current connection options for widely distributed telecontrol outstations

The telecontrol protocols used by SIMATIC PCS 7 TeleControl for remote communication are matched to the conditions of the widely distributed communication infrastructure.

Various transmission media are suitable for communication between the telecontrol center and the outstations:

- Classic WAN modes, e.g.
  - Dedicated lines
  - Private radio networks
  - Mobile radio network GSM
  - Analog or digital telephone networks
- TCP/IP based WAN modes (especially in new systems), e.g.
  - DSL or GPRS over Internet or public networks
  - Fiber-optic connections via SCALANCE X switches with optical ports (up to 120 km)
  - Radio network optimized for Ethernet on the basis of SCALANCE W industrial wireless LAN components

Classic and TCP/IP based WAN modes can also be combined within a project.

Migration of existing telecontrol systems

SIMATIC PCS 7 TeleControl V7.1 cannot only integrate new outstations 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.

Migration of an installed SINAUT LSX base

In addition, existing SINAUT LSX systems can also be migrated with SIMATIC PCS 7 TeleControl V7.1. The SIMATIC S7 controllers installed in the SINAUT LSX system with the EDC telecontrol protocol are integrated into SIMATIC PCS 7 TeleControl V7.1 per PCS 7 TeleControl S7 EDC drivers (for ordering data, refer to the previous catalog section SIMATIC PCS 7 TeleControl V7.1). 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.

Data from SIMATIC PCS 7 automation systems can be displayed together with data from the outstations of a telecontrol system on the OS clients in one process display.

When using separate servers for local plant sections and those connected per TeleControl, the multi-client architecture of the SIMATIC PCS 7 operator system allows an OS client to call data from different servers.

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).

With smaller quantity frameworks, it is also possible to use a PCS 7 TeleControl OS server with dual-channel functionality. This server is able to communicate with SIMATIC PCS 7 automation systems and outstations of a telecontrol system via two separate software channels.

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 are described, for example, in the catalog section "SINAUT ST7 telecontrol system".

**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 prompting 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 outstations per telecontrol protocol SINAUT ST7, IEC 870-5-101 or IEC 870-5-104, the raw data in the outstations is provided with a time stamp 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 is appropriate for the event-based principle of operation of the telecontrol protocol as well as the subsequent chronological processing of data buffered in the outstation.

The time of the outstations connected per SINAUT ST7, IEC 870-5-101 or IEC 870-5-104 can be synchronized by the PCS 7 TeleControl OS.

If there are increased reporting requirements for SIMATIC PCS 7 TeleControl archiving – e.g. for compliance with the ATV M260 standard for sewage treatment plants – we additionally recommend the ACRON software package, a further 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".

Additional information is available in the Internet under: [www.siemens.com/simatic-pcs7/telecontrol](http://www.siemens.com/simatic-pcs7/telecontrol)
Industry-specific applications

Telecontrol

PCS 7 TeleControl Engineering Station

Design

**PCS 7 TeleControl OS Engineering V7.1**

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.

The software package comprises 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**

**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 “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 software and a library with OS symbols, OS faceplates and OS diagnostics displays for outstations of a telecontrol system.

The OS Data Base Automation engineering software automatically generates the OS database with the display hierarchy, required variables, alarms, 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 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 line with the SIMATIC PCS 7 standard take into account the specific features of telecontrol applications. An example is the counter block which offers numerous possibilities for conditioning information concerning transported or processed quantities and volumes.

**Definition of new user blocks**

The powerful "Type Editor" allows definition of new user blocks in addition to the predefined library blocks. In addition to arrangement of information in a variable structure, the 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. The standard tools for SIMATIC PCS 7 OS engineering (Graphics Designer and Faceplate Designer) can be used to create the associated faceplates and symbols. During database generation, PCS 7 TeleControl OS DBA V7.1 treats the user blocks just like the predefined standard blocks.

Technical specifications

The following table lists the TeleControl block types which are currently supported by the function block library of PCS 7 TeleControl OS DBA V7.1 with OS faceplates and OS symbols. Each block type contains at least one faceplate and one symbol.

<table>
<thead>
<tr>
<th>Block</th>
<th>Function/function block</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter</td>
<td>Processing of count values</td>
</tr>
<tr>
<td>Measured Value</td>
<td>Processing of measured values</td>
</tr>
<tr>
<td>BitAlarm</td>
<td>Alarm</td>
</tr>
<tr>
<td>Setpoint</td>
<td>Processing of setpoints</td>
</tr>
<tr>
<td>Command</td>
<td>Processing of commands</td>
</tr>
<tr>
<td>Valve</td>
<td>Control of slide valves</td>
</tr>
<tr>
<td>Motor</td>
<td>Control of motors</td>
</tr>
<tr>
<td>Pump</td>
<td>Control of pumps</td>
</tr>
<tr>
<td>TIM</td>
<td>Diagnostics of SINAUT TeleControl interface modules</td>
</tr>
<tr>
<td>SINAUTRTU</td>
<td>Diagnostics of SINAUT outstations</td>
</tr>
<tr>
<td>MODBUSRTU</td>
<td>Diagnostics of Modbus outstations</td>
</tr>
<tr>
<td>IECRTU</td>
<td>Diagnostics of IEC 870-5-101/-104 outstations</td>
</tr>
<tr>
<td>EDCRTU</td>
<td>Diagnostics of S7 EDC outstations</td>
</tr>
</tbody>
</table>

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>6DL5 000-8AF17-0XA5</td>
<td>Software package with SIMATIC PCS 7 Engineering Software V7.1, unlimited POs (cannot be used as operator station for productive operation)</td>
</tr>
<tr>
<td>6DL5 000-8AF17-0XE5</td>
<td>To upgrade an existing SIMATIC PCS 7 Engineering Station V7.1 (unlimited POs) for PCS 7 TeleControl V7.1; software package without SIMATIC PCS 7 Engineering Software V7.1</td>
</tr>
</tbody>
</table>

**Type of delivery:**

- License key memory stick, certificate of license including terms and conditions
- SIMATIC PCS 7 Software Media Package V7.1
- CD "PCS 7 TeleControl Option V7.1"

**Type of delivery:**

- License key memory stick, certificate of license including terms and conditions
- SIMATIC PCS 7 Software Media Package V7.1
- CD "PCS 7 TeleControl Option V7.1"
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 of a telecontrol system into the process control.

Depend 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>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>SINAUT</td>
</tr>
<tr>
<td></td>
<td>Modbus</td>
</tr>
<tr>
<td></td>
<td>IEC 870-5-101/-104</td>
</tr>
<tr>
<td></td>
<td>S7 EDC</td>
</tr>
</tbody>
</table>

PCS 7 OS Software Client V7.1
See section “OS software” in chapter “Operator System” of ST PCS 7 catalog

SIMATIC PCS 7 OS Software PowerPacks (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 OS single station, PCS 7 TeleControl OS server or PCS 7 TeleControl client can be found in ST PCS 7 catalog (chapter “Industrial Workstation/PC”).
Industry-specific applications

Telecontrol

PCS 7 TeleControl Operator System

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 variables) 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, Modbus, IEC 870-5-101/-104, S7 EDC) per PCS 7 TeleControl OS single station and per PCS 7 TeleControl OS server.

Selection and Ordering Data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PCS 7 TeleControl OS Single Station V7.1 (250 POs)</th>
<th>PCS 7 TeleControl OS Server V7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6DL5 001-8AA17-0XAO</td>
<td>Software package with SIMATIC PCS 7 OS Software Single Station V7.1, 250 POs, including 512 archive variables; 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)</td>
<td>Type of delivery: • License key memory stick, certificate of license including terms and conditions • SIMATIC PCS 7 Software Media Package V7.1 • CD &quot;PCS 7 TeleControl Option V7.1&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PCS 7 TeleControl OS Redundant Server V7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6DL5 002-8BA17-0XAO</td>
<td>Software package with SIMATIC PCS 7 Server Redundancy V7.1, 250 POs, including 512 archive variables (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)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>PCS 7 TeleControl OS Runtime Component Option V7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6DL5 002-8AA17-0XE0</td>
<td>Software package without SIMATIC PCS 7 OS Software Server V7.1; Runtime software, 2 languages (German, English), software class A, executes with Windows XP Professional or Windows Server 2003, single license for 1 installation; Electronic documentation on CD, 2 languages (German, English)</td>
</tr>
</tbody>
</table>
### Selection and Ordering Data

<table>
<thead>
<tr>
<th>PCS 7 TeleControl</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINAUT Driver</td>
<td>6DL5 101-8AX00-0XB0</td>
</tr>
<tr>
<td>Modbus Driver</td>
<td>6DL5 101-8BX00-0XB0</td>
</tr>
</tbody>
</table>

**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 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

### Selection and Ordering Data

<table>
<thead>
<tr>
<th>PCS 7 TeleControl</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 870-5-101/-104 Driver</td>
<td>6DL5 101-8CX00-0XB0</td>
</tr>
<tr>
<td>S7 EDC Driver</td>
<td>6DL5 101-8DX00-0XB0</td>
</tr>
</tbody>
</table>

**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 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
SINAUT ST7 telecontrol system

Overview

SINAUT ST7 is a telecontrol system based on SIMATIC S7 (S7-300, S7-400 and SIMATIC PCS 7). It is used for fully-automatic monitoring and control of widely distributed process stations (outstations) which exchange data with each other and with one or more control centers over a wide variety of WAN (Wide Area Network) media.

SINAUT ST7 can be completely integrated into the SIMATIC environment, and thus into the uniform communications concept of Totally Integrated Automation (TIA). The modular design together with supporting of many different operating modes and types of network, including TCP/IP-based networks, allow the design of flexible network topologies, also with redundant interfacing.

The networks can be optimally adapted to the respective local conditions through use of versatile transmission media. These transmission media include e.g. dedicated line, radio, dial-up networks, mobile radio, DSL, etc.

The SINAUT ST7 engineering software and STEP 7 allow even highly complex networks and their extension to be configured simply and cost-effectively.

Migration of SINAUT ST1 stations based on SIMATIC S5

During the migration of existing systems, it is also possible to integrate outstations based on SIMATIC S5 into the SIMATIC PCS 7 process control system using SIMATIC PCS 7 TeleControl. In the process, the ST1 telecontrol protocol is converted into the ST7 protocol in the central TIM communication module.

Note:
SINAUT ST7 can be used together with SIMATIC PCS 7 TeleControl V7.1 and SIMATIC PCS 7 V7.1.

Benefits

The SINAUT ST7 telecontrol system supported by SIMATIC PCS 7 TeleControl V7.1 is particularly characterized by the following features:

- Seamless integration into HMI function of SIMATIC PCS 7 process control system
- Insensitive time response with regards to slow transmission links
- Good time resolution for all processing operations as result of local time stamping
- Data buffering in the outstation to protect against loss of important data (e.g. counter values) due to interferences or connection failures as may sporadically occur in radio networks, for example
- Reduction in data volume to be transmitted as result of event-controlled protocol function for alarms and analog values
- Supports a wide range of public and private communication links, including dedicated lines, dial-up connections (analog, ISDN, GSM), TCP/IP-based procedures (DSL, GPRS)
- Classic and TCP/IP-based WAN media can be combined as desired, including path redundancy
- Automatic monitoring and status control of all telecontrol stations including alarm output on failure of station or connection (remote diagnostics)
- Direct programming and parameterization of the outstations via the telecontrol connection, independent of the transmission medium used
Industry-specific applications

Telecontrol - SINAUT ST7

Design

SINAUT ST7 uses components of SIMATIC S7-300, S7-400 and the C7 compact control system as well as SIMATIC PCS 7, and supplements these by its own hardware and software components.

Hardware components belonging to the SINAUT range
- TIM communication modules
- MD modems modules
- Mobile radio components (GSM/GPRS)
- Dedicated line accessories
- Connecting cables

Software components belonging to the SINAUT range
- 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

Complete hierarchical telecontrol networks can be implemented with SINAUT ST7, and comprise outstations, submaster stations and control centers. These can be designed with star, line and node topologies, as well as mixed configurations of these basic topologies.

Classic types of WAN can be used, such as dedicated line, radio or dial-up networks as well as TCP/IP-based WAN types such as DSL, GPRS or Internet, and can be combined as desired within a project.

Classic WAN
- Dedicated copper line, private or rented
- Private radio network (optionally with time slot procedure)
- Analog telephone network
- Digital ISDN network
- Mobile radio network GSM

TCP/IP-based WAN
- Special radio network optimized for Ethernet, e.g. with SCALANCE W IWLAN components
- SCALANCE X switches with optical ports and fiber-optic cables for distances up to 70 km
- Public network and Internet via DSL or GPRS
- Broadband system such as OTN, PCM30, etc.

To achieve redundant data transmission, it is also possible to connect an outstation via two transmission paths to the SIMATIC PCS7 process control system or to a submaster station. It is irrelevant whether the two paths are of the same type or different, e.g. dedicated line with telephone network/ISDN plus GPRS.

A clear presentation of possible dedicated line, radio and dial-up network configurations with information on protocols and operating modes as well as examples of redundant network configurations can be found in the IPI PI Catalog in the introduction to the chapter "SINAUT Telecontrol", section "Topologies".

Function

The functionality of the SINAUT ST7 telecontrol system is particularly characterized by the following features:

- Data transmission only following changes
- The process data is only transmitted between the CPUs of the outstations and between the CPU of an outstation and the control center in SIMATIC PCS 7 when changes occur. Failures in connections, CPUs or the control center are indicated. Following elimination of a fault or starting-up of a CPU or the control center, a data update is automatically carried out for all communication peers involved.
- Date and time always correct
- All data message frames are already assigned a time stamp at their position of origin. Thus the SIMATIC PCS 7 process control system can archive the process data in the correct chronological sequence. The time of the SINAUT ST7 stations on the WAN can be synchronized via SIMATIC PCS 7 TeleControl – including summertime/wintertime switchover.
- Data storage on site
- A special feature of the TIM communication module used in the SINAUT ST7 system is its capability to save data which must not be lost should the connection or the partner fail. It provides a memory capacity for up to 56 000 message frames for this purpose.

In the case of dial-up networks, the storage capability saves charges. Different priorities can be assigned to the data to be transmitted. A dial-up connection is immediately established if the priority is high. If the priority is low, the data is first saved on the TIM. It is transmitted during the next connection to the peer. This can be, for example, if information with a high priority is to be transmitted or if the peer establishes a connection for data exchange.

The ability of the TIM module to save data temporarily and transmit it with a delay of several hours or even days places high demands on the processing of process data in the control center, especially with regards to the subsequent archiving. Archive compression, such as the generation of mean, hourly and daily values, can only be started when all data for the associated period has been received. A control center with the capabilities of the state-of-the-art SIMATIC PCS 7 process control system is particularly suitable in this case.

- Remote programming and diagnostics
- In the industries in which SINAUT is used, the stations are often widely distributed and are frequently located at positions that are difficult to access. Since the telecontrol protocol with the function "PG routing" allows remote programming and remote diagnostics over the WAN, this greatly facilitates engineering, maintenance and servicing, and avoids many complicated and expensive journeys. All diagnostics and programming functions made available by SIMATIC and SINAUT for station automation and WAN communication can be used beyond the telecontrol path – while transmission of process data is taking place. PG routing and data traffic divide the available bandwidth of the transmission path, where PG routing is assigned a higher priority. In this manner, uploads, downloads, remote diagnostics, firmware upgrades or modifications to the station automation are possible online from the control center in SIMATIC PCS 7.

- Alarm output per text message
- The CPUs of the outstations are able to send event-controlled text messages to a mobile telephone in order to alarm standby personnel. Receipt of the message can be acknowledged to the signaling CPU from the mobile phone. E-mail, fax or voice mail are also possible as alternatives to output of a text message. A prerequisite, however, is that the mobile phone provider offers these options for its text message service.
Operating modes in the classic WAN

- **Polling**: In polling mode, data exchange is controlled by the TIM module of the control center. It polls the connected stations (also submaster stations) in succession. Stations whose data has changed are included in each message frame. Information on the source and target addresses is included in each message frame. Up to 10,000 nodes can be addressed. The poll is unidirectional and not acknowledged. Data exchange with the control center is always via the polling TIM of the control center.

- **Polling with time slot procedure**: Polling mode with time slot procedure is used in a radio network in which the radio frequency assigned by the registration authority has to be shared with other users. Every user is usually assigned 6 seconds per minute to exchange data with his stations. He must then release the frequency for the next user. During the assigned time slot, operation is just like with normal polling. Slave-to-slave communication between the stations is also possible. Data exchange is always via the polling TIM of the control center. In order to exactly observe the time slot, the polling TIM of the control center must be equipped with a DCF77 or GPS radio clock.

- **Multimaster polling with time slot procedure**: The multimaster polling mode with time slot procedure is used if stations in the dedicated line or radio network have to communicate with more than one control center. Each of the connected control centers is assigned one or more defined time slots per minute for polling. The control centers then alternate within this minute when polling. This polling version functions similar to the polling mode with time slot procedure. In this case, however, a separate data buffer is present in the stations (also submaster stations) for each control center. Slave-to-slave communication between the stations is also possible. Data exchange is via the polling TIM of the active control center. Since several control centers are present, slave-to-slave communication can also be redundant, i.e. should the preferred control center fail, the alternative control center takes over the slave-to-slave communication. In order to exactly observe the time slots, each TIM of the involved control centers must also be equipped with a DCF77 or GPS radio clock in this mode.

- **Spontaneous mode**: For transmission in the TCP/IP-based network, a permanent S7 connection is established between two TIMs or between a TIM and the control center integrated in SIMATIC PCS 7 by means of SIMATIC PCS 7 TeleControl. With application of the TCP/IP transport protocol, the two TIMs or the TIM and the control center exchange the data packets specific to SINAUT ST7. Transmission is carried out with the S7 communication functions, were handling of spontaneous data exchange depends on whether the transmitted data quantity in the TCP/IP-based network requires payment or not.
  - Networks without data quantities requiring payment: When sending, all data is transmitted immediately to the respective peer, i.e. without intermediate storage. Transmission of the message frames with alarm priority is carried out first. The further sequence corresponds to the FIFO principle.
  - Networks with data quantities requiring payment: With a TCP/IP-based network in which the quantity of transmitted data has to be paid for, e.g. with the GPRS network, the priority of the individual data message frames (normal, high or alarm) is carried out as with a dial-up network. Data with normal priority are collected, and transmitted in larger blocks. The moment at which the blocks are transmitted depends on a certain block size or on the sequence of the set TCP/IP keep-alive interval. The transmission volume can be reduced by saving message frame overhead and acknowledgment message frames. Data with alarm priority and high priority is transmitted immediately, while data with alarm priority is sent first. Normal message frames which have already been buffered are then sent at the same time. The transmission sequence of the message frames with high and normal priority is also based here on the FIFO principle.

More information

Detailed information, ordering data and technical specifications of the SINAUT ST7 telecontrol system and the individual components of this system can be found in the chapter “SINAUT Telecontrol” of the IK PI Catalog.

Additional information is available in the Internet under: www.siemens.com/sinaut
Overview

Telecontrol connection of SIPLUS RIC outstations per Modbus or IEC 870-5-101/104

When using the SIPLUS RIC telecontrol system, the telecontrol center with SIMATIC PCS 7 TeleControl V7.1 can be integrated seamlessly into the SIMATIC PCS 7 V7.1 process control system.

Telecontrol communication between the control center and the SIPLUS RIC outstations is possible in serial mode and also over Ethernet TCP/IP communication connections – optionally with the telecontrol protocols

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

The telecontrol center is the master during communication with the SIPLUS RIC outstations. The SIPLUS RIC outstations are, on the one hand, slaves of the control center, but can additionally be the master for the telecontrol connection of subordinate outstations (IEC 870-5-101/-104/-103 slaves) with a protocol expansion SIPLUS RIC IEC on S7.

Design

SIPLUS RIC bundles

In addition to various libraries for telecontrol protocols, the product range of the SIPLUS RIC telecontrol system particularly comprises low-cost bundles for outstations which are based on SIMATIC ET 200S with integral CPU, SIMATIC S7-300 or SIMATIC S7-400.

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 Extrema", they are also suitable for operation under exceptional conditions, e.g. ambient temperatures from -25 °C to +70 °C, condensation or extraordinary medial loads.
Industry-specific applications

Telecontrol - SIPLUS RIC

Telecontrol connection
to control center in SIMATIC PCS 7

Scalable performance

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

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 automation system (S7-400/S7-300/ET 200S with CPU) then serves as a converter between the protection data protocol IEC 870-5-103 and the protocol IEC 870-5-101 or IEC 870-5-104.

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

Flexible communication options with SIPLUS RIC in a Wide Area Network (WAN)
Industry-specific applications
Telecontrol - SIPLUS RIC

Telecontrol connection to control center in SIMATIC PCS 7

Network topologies
SIPLUS RIC allows telecontrol networks with line and star topologies. To permit redundant data transmission, an outstation can be connected to the control center over two paths.

Various transmission media are suitable for communication between the telecontrol center and the outstations. Depending on the telecontrol protocol, both classic and TCP/IP-based communication modes can be selected. These modes can also be combined flexibly within a project.

Classic WAN communication
- Dedicated line via modem, e.g. SINAUT MD2
- Dedicated line via fiber-optic cables
- Private radio networks

TCP/IP-based WAN communication
- Ethernet networks, e.g. SCALANCE X with fiber-optic cables
- Industrial Wireless LAN with SCALANCE W
- Public networks and the Internet using DSL and/or GPRS
- Satellite communication, e.g. with Inmarsat

The materials required to design a telecontrol link, such as converter between TCP/IP and serial, dedicated line modem, media converter, TCP/IP router, switch, cable, etc. are accessories which are not included in this catalog.

Selection and Ordering Data

Order No.
SIPLUS RIC IEC on S7 bundles for telecontrol connection to control center in SIMATIC PCS 7

Bundles with SIMATIC ET 200S (CPU integrated) for up to 200 information points
Runtime software and electronic documentation, 2 languages (German, English), software class A, single license for 1 installation

Standard bundles with IEC 870-5-101 telecontrol protocol (serial)

SIPLUS RIC ET 200S Bundle IEC 870-5-101 Slave with SIMATIC IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232 interface
6AG6 003-5BA00-1BA0

SIPLUS RIC ET 200S Bundle IEC 870-5-101 Slave with SIMATIC IM 151-8 PN/DP CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232 interface
6AG6 003-5BA01-1BA0

Extreme bundles with IEC 870-5-101 telecontrol protocol (serial)

SIPLUS RIC ET 200S Extreme Bundle IEC 870-5-101 Slave with SIMATIC IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232 interface
6AG6 003-6BA00-1BA7

SIPLUS RIC ET 200S Extreme Bundle IEC 870-5-101 Slave with SIMATIC IM 151-8 PN/DP CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232 interface
6AG6 003-6BA01-1BA7

Standard bundles with IEC 870-5-104 telecontrol protocol (TCP/IP)

SIPLUS RIC ET 200S Bundle IEC 870-5-104 Slave with SIMATIC IM 151-8 PN/DP CPU incl. 128 KB Micro Memory Card
6AG6 003-5BB00-1BA0

Extreme bundles with IEC 870-5-104 telecontrol protocol (TCP/IP)

SIPLUS RIC ET 200S Extreme Bundle IEC 870-5-104 Slave with SIMATIC IM 151-8 PN/DP CPU incl. 128 KB Micro Memory Card
6AG6 003-6BB00-1BA7
Industry-specific applications

Telecontrol - SIPLUS RIC

Selection and Ordering Data

**Telecontrol connection to control center in SIMATIC PCS 7**

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bundles with SIMATIC S7-300 PLC for up to 2,000 information points</strong></td>
<td></td>
</tr>
<tr>
<td>Runtime software and electronic documentation, 2 languages (German, English), software class A, single license for 1 installation</td>
<td></td>
</tr>
<tr>
<td>Standard bundles with IEC 870-5-101 telecontrol protocol (serial)</td>
<td></td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 314 incl. 128 KB Micro Memory Card, CP 341 with RS 232 interface</td>
<td>6AG6 003-1BA01-1BA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 314 incl. 128 KB Micro Memory Card, CP 341 with RS 232 interface</td>
<td>6AG6 003-1BA01-4BA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 315-2 DP incl. 512 KB Micro Memory Card, CP 341 with RS 232 interface</td>
<td>6AG6 003-1BA02-4CA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 319-3 PN/DP incl. 2 MB Micro Memory Card, CP 341 with RS 232 interface</td>
<td>6AG6 003-1BA06-4DA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Extreme Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 314 incl. 128 KB Micro Memory Card, CP 340 with RS 232 interface</td>
<td>6AG6 003-2BA01-1BA7</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Extreme Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 315-2 DP incl. 512 KB Micro Memory Card, CP 341 with RS 232 interface</td>
<td>6AG6 003-2BA02-4CA7</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Extreme Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 317-2 PN/DP incl. 2 MB Micro Memory Card, CP 341 with RS 232 interface</td>
<td>6AG66003-2BA05-4DA7</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 314 incl. 128 KB Micro Memory Card, CP 340 with RS 232 interface</td>
<td>6AG6 003-1BB01-7BA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 315-2 DP incl. 128 KB Micro Memory Card, CP 343-1 Lean</td>
<td>6AG6 003-1BB02-7CA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 317-2 PN/DP incl. 512 KB Micro Memory Card, CP 343-1</td>
<td>6AG6 003-1BB03-8CA0</td>
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</tbody>
</table>

Extreme bundles with IEC 870-5-104 telecontrol protocol (TCP/IP)

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIPLUS RIC S7-300 Extreme Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 314 incl. 128 KB Micro Memory Card, CP 340 with RS 232 interface</td>
<td>6AG6 003-1BB11-0CA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Extreme Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 315-2 DP incl. 128 KB Micro Memory Card</td>
<td>6AG6 003-1BB05-0DA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-300 Extreme Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 317-2 PN/DP incl. 2 MB Micro Memory Card</td>
<td>6AG6 003-1BB06-0DA0</td>
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</tbody>
</table>

Standard bundles with SIMATIC S7-400 PLC for up to 5,000 information points

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard bundles with IEC 870-5-101 telecontrol protocol (serial)</td>
<td></td>
</tr>
<tr>
<td>SIPLUS RIC S7-400 Bundle 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>
<td>6AG6 003-3BA00-1BA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-400 Bundle IEC 870-5-101 Slave with SIMATIC S7-CPU 412-1 incl. 256 KB Memory Card, CP 441-2 with two RS 232 interfaces</td>
<td>6AG6 003-3BA00-4BA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-400 Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 414-3 PN/DP incl. 1 MB Memory Card, CP 443-1</td>
<td>6AG6 003-3BB01-7CA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-400 Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 414-3 PN/DP incl. 4 MB Memory Card</td>
<td>6AG6 003-3BB04-0EA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-400 Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 416-3 PN/DP incl. 16 MB Memory Card</td>
<td>6AG6 003-3BB07-0GA0</td>
</tr>
<tr>
<td>SIPLUS RIC S7-400 Extreme Bundle IEC 870-5-104 Slave with SIMATIC S7-CPU 416-3 PN/DP incl. 16 MB Memory Card</td>
<td>6AG6 003-4BB07-0GA4</td>
</tr>
</tbody>
</table>

B) Subject to export regulations: AL: N, ECCN: EAR99H
### Industry-specific applications

**Telecontrol - SIPLUS RIC**

### Telecontrol connection to control center in SIMATIC PCS 7

#### Selection and Ordering Data

<table>
<thead>
<tr>
<th>SIPLUS RIC Modbus bundles for telecontrol connection to control center in SIMATIC PCS 7</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard bundles with Modbus telecontrol protocol (serial)</strong></td>
<td></td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 422/RS 485 interface and Modbus protocol</td>
<td>6AG6 003-5BD00-2BA0</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC IM 151-8 PN/PDP CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 422/RS 485 interface and Modbus protocol</td>
<td>6AG6 003-5BD01-2BA0</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 422/RS 485 interface and Modbus protocol</td>
<td>6AG6 003-6BD00-2BA7</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC IM 151-8 PN/PDP CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 422/RS 485 interface and Modbus protocol</td>
<td>6AG6 003-6BD01-2BA7</td>
</tr>
<tr>
<td><strong>Extreme bundles with Modbus telecontrol protocol (serial)</strong></td>
<td></td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC IM 151-8 PN/PDP CPU incl. 128 KB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-5BE01-0BA0</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC IM 151-8 PN/PDP CPU incl. 128 KB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-6BE01-0BA7</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC S7-300 Bundle Modbus Slave with SIMATIC S7-CPU 317-2 PN/PDP incl. 2 MB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-1BE03-0CA0</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC S7-300 Extreme Bundle Modbus Slave with SIMATIC S7-CPU 319-3 PN/PDP incl. 2 MB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-1BE05-0DA0</td>
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<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC S7-300 Bundle Modbus Slave with SIMATIC S7-CPU 312-2 PN/PDP incl. 512 KB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-1BE06-0DA0</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC S7-300 Extreme Bundle Modbus Slave with SIMATIC S7-CPU 317-2 PN/PDP incl. 512 KB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-2BE03-0CA7</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC S7-300 Extreme Bundle Modbus Slave with SIMATIC S7-CPU 319-3 PN/PDP incl. 512 KB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-2BE05-0DA7</td>
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</table>

#### Selection and Ordering Data

<table>
<thead>
<tr>
<th>SIPLUS RIC Modbus bundles for telecontrol connection to SIMATIC ET 2005 (CPU integrated) for up to 200 information points</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard bundles with Modbus telecontrol protocol (serial)</td>
<td></td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 422/RS 485 interface and Modbus protocol</td>
<td>6AG6 003-0AC12-0AA0</td>
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<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC IM 151-8 PN/PDP CPU incl. 128 KB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-0AC02-0AA0</td>
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<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC IM 151-7 CPU incl. 128 KB Micro Memory Card, 1SI module with RS 232/RS 422/RS 485 interface and Modbus protocol</td>
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#### Selection and Ordering Data

<table>
<thead>
<tr>
<th>SIPLUS RIC Modbus bundles for telecontrol connection to SIMATIC ST-300 PLC for up to 2,000 information points</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard bundles with Modbus telecontrol protocol (TCP/IP)</td>
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</tr>
<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC S7-CPU 315-2 PN/PDP incl. 512 KB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-1BE05-0DA0</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC S7-CPU 319-3 PN/PDP incl. 2 MB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-1BE06-0DA0</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Bundle Modbus Slave with SIMATIC S7-CPU 317-2 PN/PDP incl. 2 MB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-2BE03-0CA7</td>
</tr>
<tr>
<td>SIPLUS RIC ET 2005 Extreme Bundle Modbus Slave with SIMATIC S7-CPU 319-3 PN/PDP incl. 2 MB Micro Memory Card, library S7-OPEN MODBUS/TCP PN-CPU, single license for 1 installation and registration code</td>
<td>6AG6 003-2BE05-0DA7</td>
</tr>
</tbody>
</table>
Industry-specific applications
Telecontrol - SIPLUS RIC

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)

Configuration examples of the telecontrol connection of SIMATIC PCS 7 automation systems of single station design with the IEC 870-5-101 and IEC 870-5-104 telecontrol protocols

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, cable, etc., are accessories which are not included in this catalog.

In the SIMATIC PCS 7 automation system, additive driver blocks from the SIPLUS RIC IEC on 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 IEC on S7 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 IEC on S7 library is independent of SIMATIC PCS 7 Tele-Control.
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.

Configuration example of the telecontrol connection of redundant SIMATIC PCS 7 AS 412H/AS 414H/AS 417H with the IEC 870-5-101 telecontrol protocol.
Telecontrol - SIPLUS RIC

Telecontrol connection to third-party control center

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

- 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.

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

Selection and Ordering Data

<table>
<thead>
<tr>
<th>SIPLUS RIC IEC on S7 library</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runtime software for one automation system, 2 languages (German, English), software class A, single license for 1 installation</td>
<td>6AG6 003-0BA11-0AA0</td>
</tr>
<tr>
<td>Type of delivery: Certificate as well as CD-ROM with software and electronic documentation (German/English)</td>
<td></td>
</tr>
<tr>
<td>Note: Software activation by phone</td>
<td></td>
</tr>
<tr>
<td>• For AS single station, IEC 870-5-101 slave protocol Function block library for S7-400, CP 441 interface</td>
<td>6AG6 003-0BA01-0AA0</td>
</tr>
<tr>
<td>• For AS redundant station, IEC 870-5-101 slave protocol Function block library for S7-400H, CP 340/341 interface</td>
<td></td>
</tr>
<tr>
<td>• For AS single or redundant station, IEC 870-5-104 slave protocol Function block library for S7-400/S7-400H, CP 443-1 interface</td>
<td>6AG6 003-0BB11-0AA0</td>
</tr>
</tbody>
</table>
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.

Application of PAT provides you with the following capabilities:

- 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
- Early initiation of control measures depending on the analytical results to guarantee the end product quality
- Guaranteeing of uniform product quality through adaptation of process when upscaling from laboratory operation to production mode or when changing the production quantities
- Validation of process in accordance with statutory directives

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 simply 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.

**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. Important advantages are already defined by the following targets of PAT:

- Expansion and deepening of knowledge concerning the complete process and internal relationships
- Product approval in real-time
- Guaranteed, uniformly high product quality
- Improvement in total performance of process
- Compliance with statutory directives through online quality control

Other numerous advantages can be 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
- Improved quality through integral quality control
  - Reduced risk of recalls
  - Reduction in 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

**Overview**

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

**Industry-specific applications**

**Process Analytical Technology**

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 V3.0 can be used together with SIMATIC PCS 7 V7.1.
Industry-specific applications

Process Analytical Technology

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

- Increased market share
  - Winning of market shares through faster product development and launching
  - Process patenting provides competitive advantages
- Image upgrading
  - Innovative product/production technologies
  - Minimization of risk of recalls, warning notifications or declarations of consent

**Application**

SIMATIC SIPAT V3.0 is preferably recommended 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 provided on the DVD with SIMATIC SIPAT V3.0 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+
- Umetrics SIMCA P+
- 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

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 V3.0 (see example of a distributed SIMATIC SIPAT architecture). The following table shows the hardware assignment of the software components for the recommended SIMATIC SIPAT V3.0 architecture:

<table>
<thead>
<tr>
<th>TCP/IP</th>
<th>SIMATIC SIPAT client station</th>
<th>SIMATIC SIPAT Database Server</th>
<th>SIMATIC SIPAT Web Server</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SIMATIC SIPAT collector stations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O modules</td>
<td>Instrument/ analyzer</td>
<td>SIMATIC SIPAT Base Station</td>
<td>SIMATIC SIPAT Chemometrics Server</td>
</tr>
</tbody>
</table>
Industry-specific applications
Process Analytical Technology

SIMATIC SIPAT: Optimization of product development and production

<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>
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<td></td>
<td>SIMATIC SIPAT Matlab Server</td>
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<tr>
<td>SIMATIC SIPAT Collector Station</td>
<td>SIMATIC SIPAT Productivity Pack</td>
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<td>SIMATIC SIPAT Watchdog Service</td>
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<td>SIMATIC SIPAT Workflow Service</td>
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<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 MATLAB Server</td>
<td>Alternative, customer-specific</td>
</tr>
</tbody>
</table>

Other possibilities for flexible adaptation to the technological process result from the license model which is fixed in the product range of SIMATIC SIPAT V3.0. It is defined as follows:

SIMATIC SIPAT Base Station
(full license: four simultaneously executed methods)

SIMATIC SIPAT Base Station is the PAT application for a production unit. It uses the data from one or more analyzers together with the data in the environment of existing systems (DCS, SCADA, MES, ERP, LIMS, or Historian) for the determination of “Qualitative Process Fingerprints” or the prediction of “Critical-to-Quality” parameters. To this end it collects run-time data from the various sources using configurable methods, matches these with each other, and carries out complex calculations.

All recorded production, configuration and Audit Trail data is saved together with user-specific context information in the SIMATIC SIPAT Central Database. The data can be used to improve understanding of the process and to optimize the process.

SIMATIC SIPAT Model Builder

The SIMATIC SIPAT Model Builder is typically used offline to process historical data and to transfer it to chemometric software. The SIMATIC SIPAT Model Builder carries out version assignment and administration (lifecycle) for the MVDA model determined by the chemometric software. It also supports validation and optimization of these models.

SIMATIC SIPAT Basic Package

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

SIMATIC SIPAT Basic Package Trial Version

The license of the SIMATIC SIPAT Basic Package Trial Version limits the duration of use of the SIMATIC SIPAT Basic Package to 90 days. It cannot be expanded by the SIMATIC SIPAT Basic Package PowerPack.

SIMATIC SIPAT Basic Package PowerPack

The SIMATIC SIPAT Basic Package PowerPack license expands the SIMATIC SIPAT Basic Package present in a SIMATIC SIPAT Basic Package 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
Industry-specific applications
Process Analytical Technology

SIMATIC SIPAT: Optimization of product development and production

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 V3.0:

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

The Model Builder is used to preprocess the product and process data recorded with SIMATIC SIPAT. It can be used to evaluate data and to design and validate models. SIMATIC SIPAT records data during runtime, preprocesses it, and 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.

The 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.

In contrast to other PAT systems which are usually limited to one 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 types

- **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.

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.

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

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 is based 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>Order No.</th>
<th>Selection and Ordering Data</th>
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</thead>
<tbody>
<tr>
<td>6DL5 422-8AB03-0BA0</td>
<td>SIMATIC SIPAT V3.0 software</td>
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<tr>
<td>6DL5 422-8X03-0BB0</td>
<td>SIMATIC SIPAT Model Builder V3.0</td>
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<tr>
<td>6DL5 422-1XA03-0BA0</td>
<td>SIMATIC SIPAT Basic Package (1 method) V3.0</td>
</tr>
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</table>

**SIMATIC SIPAT Base Station (4 methods) V3.0**

- for simultaneous use of up to 4 "typical" SIMATIC SIPAT methods on a distributed SIMATIC SIPAT Base Station
- Engineering and runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation
- Including 1 x SIMATIC SIPAT Productivity Pack Analyser Type V3.0 single license
- Electronic documentation on DVD "SIMATIC SIPAT V3.0", 1 language (English)
- Requirement: available only with a SIMATIC SIPAT support contract.
- Type of delivery:
  - Certificate of license incl. terms and conditions, product information
  - DVD "SIMATIC SIPAT V3.0"

**SIMATIC SIPAT Model Builder V3.0**

- for one simultaneous user per SIMATIC SIPAT database
- 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 Base Station (4 methods)
- Type of delivery:
  - Certificate of license incl. terms and conditions, product information
  - DVD "SIMATIC SIPAT V3.0"

**SIMATIC SIPAT Basic Package (1 method) V3.0**

- for simultaneous use of one "typical" SIMATIC SIPAT method on a distributed SIMATIC SIPAT Base Station
- Engineering and runtime software, 1 language (English), software class A, executes with Windows XP Professional / Server 2003, single license for 1 installation
- Including 1 x SIMATIC SIPAT Model Builder V3.0 single license
- Electronic documentation, 1 language (English), on DVD "SIMATIC SIPAT V3.0"
- Requirement: available only with a SIMATIC SIPAT support contract.
- Type of delivery:
  - Certificate of license incl. terms and conditions, product information
  - DVD "SIMATIC SIPAT V3.0"
## Selection and Ordering Data

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Type of delivery:
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Type of delivery:
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E) Subject to export regulations: AL: N, ECCN: 5D992
### Industry-specific applications

**Process Analytical Technology**

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

#### Selection and Ordering Data

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<td>6DL5 422-1XX03-1BA0</td>
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<td><strong>standard support</strong></td>
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<td>5 days/week (Monday to Friday)</td>
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<td>in one of the three following time</td>
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<td>Europe: 08:00 to 17:00 GMT</td>
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<tr>
<td>all SIMATIC SIPAT Base Stations</td>
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<tr>
<td>Including SIPAT Software Update Service (SUS)</td>
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<td>information</td>
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<tr>
<td>• DVD “Service &amp; Support Knowledge Base”</td>
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<td><strong>Silver Support</strong></td>
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<tr>
<td>24 hours per day on 5 days per week</td>
<td></td>
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<tr>
<td>(Monday 00:00 to Friday 24:00 GMT,</td>
<td></td>
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<tr>
<td>including holidays)</td>
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<td>• DVD “Service &amp; Support Knowledge Base”</td>
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<td><strong>SIMATIC SIPAT V3.0</strong></td>
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<tr>
<td>day on 7 days per week, including</td>
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<tr>
<td>holidays</td>
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### More information

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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

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Industry-specific applications
### Operator control and monitoring

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<td>5/19</td>
<td>Operator’s ToolSet</td>
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Operator control and monitoring

**OPD: Operator dialog with electronic signatures**

**Overview**

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](http://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" (previously: FunkServerPro) takes such requirements into account by sending SIMATIC PCS 7 error messages fully automatically to a wide range of possible receivers (SMS to mobile phone, fax, voice output, 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>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AE4 310-3BS01</td>
<td>Alarm Control Center &quot;Basic Edition&quot; Core system for local installation on a SIMATIC PCS 7 station</td>
</tr>
<tr>
<td>9AE4 310-3BS02</td>
<td>Alarm Control Center &quot;Professional Edition&quot; Core system for connection of several (max. 6) SIMATIC PCS 7 stations (also redundant systems)</td>
</tr>
<tr>
<td>9AE4 310-3BS03</td>
<td>Alarm Control Center &quot;Enterprise Edition&quot; Core system for connection of several (more than 6) SIMATIC PCS 7 stations (also redundant systems)</td>
</tr>
<tr>
<td>9AE4 310-3PW02</td>
<td>PCS 7 Agent for Alarm Control Center Connection of a (further) SIMATIC PCS 7 system to the Alarm Control Center via LAN (one license already included with each core system)</td>
</tr>
<tr>
<td>9AE4 310-3FG10</td>
<td>Alarm Control Center transmitter channel &quot;SMS via GSM modem, dual-band&quot; For direct sending of text messages in the GSM network with acknowledgment function (including dual-band hardware for use in Europe)</td>
</tr>
<tr>
<td>9AE4 310-3FG12</td>
<td>Alarm Control Center transmitter channel &quot;SMS via GSM modem, quad-band&quot; For direct sending of text messages in the GSM network with acknowledgment function (including quad-band hardware for global use)</td>
</tr>
<tr>
<td>9AE4 310-3FV10</td>
<td>Alarm Control Center transmitter channel &quot;Voice output&quot; Voice output (WAV files) to any phone, requires ISDN card</td>
</tr>
<tr>
<td>9AE4 310-3FE10</td>
<td>Alarm Control Center transmitter channel &quot;E-mail&quot; Sending of e-mail via SMTP server</td>
</tr>
</tbody>
</table>

PCS 7 Add-on fit for SIMATIC PCS 7 V7

E) Subject to export regulations: AL: N, ECCN: 5D992

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
Alarm Management Competence Center
Stuttgart
Phone: +49 711 137 2060
Fax: +49 711 137 2781
E-mail: info@alarmcc.com

You can find additional information in the Internet at:

www.siemens.de/alarmcc
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”, 70”, 80”</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”, 70”</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), &lt;br&gt;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”</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.
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 Sense6 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
Barco Control Rooms GmbH
An der Rossweid 5
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E-mail: sales.controlrooms@barco.com

USA (North America)
Phone: +1 678 4758000

Brazil (South America)
Phone: +55 11 3842-1656
E-mail: barco.ltda@terra.com.br

Dubai UAE (Middle East)
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Asia
Hong Kong
Phone: +852 23970752

Beijing
Phone: +86 10 65888951

Singapore
Phone: +65 62437610

Japan
Phone: +81 3 57628720

Additional information is available in the Internet under:
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.

---

**Application**

With the aid of the KVM extenders, the operating personnel can operate and monitor the process from the control room, while the computers are located in a secure and air-conditioned technology room separate from the operator panels.

---

**Design**

The KVM extenders DVIVision, CATVision, LwLVision, FIBREVision and DL-Compact each consist of a transmitter unit and a receiver unit in desktop or 19” design which are connected to one another by means of a CAT cable (5/6/7) or a fiber-optic cable. They are independent of the system platform and the operating system. An operator station can be set up on the transmitter and receiver (exception: KVM extender DL-Compact). On the KVM extender DL-Compact, an operator station can only be used at the receiver end.

The standard interfaces are used for the computer connection. Neither software settings nor computer adjustments are necessary.

With the exception of the DL-Compact, all KVM extenders support multi-channel operation with 2 (LwLVision) or up to 4 video signals. Depending on the multi-monitor graphic controller of the computer and the selected KVM extender, it is thus possible to use up to 4 process monitors on one operator station.

By means of an KVM switch, local maintenance by an administrator can be centralized in the control room.
### 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>
</tbody>
</table>

**Video**

- **Input**
  - Digital (single link)
  - Analog
  - Analog or digital (single link)
  - Digital (single link)
  - Digital (dual link)

- **Output**
  - Analog or digital
  - Analog
  - Analog or digital
  - Analog or digital
  - Digital

- **Maximum resolution**
  - 1920 x 1200 at 60 Hz
  - 1920 x 1440 at 75 Hz (depending on distance)
  - 1280 x 1024 at 75 Hz, 1920 x 1200 at 60 Hz
  - 1920 x 1200 at 60 Hz
  - 2560 x 1600 at 60 Hz, 2048 x 2048 at 60 Hz

- **Number of channels**
  - Up to 4
  - Up to 4
  - Up to 2
  - Up to 4
  - 1

**Expandability**

- With KVM switch
- With KVM switch
- With KVM switch
- With KVM switch
- With KVM switch

**Note:**

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

### More information

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Systementwicklung  
Dortmunder Str. 4a  
57234 Wilnsdorf  
Germany

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Fax: +49 27 39-89 01-120  
E-mail: sales@gdsys.de

You can find additional information in the Internet at:  
[www.gdsys.de/](http://www.gdsys.de/)
KVM matrix switches:
Flexible operator station administration

Overview

By using the compact KVM matrix switches, you can access several servers of a system from multiple 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.

Design

CATCenter NEO system

Architecture with KVM matrix switch CATCenter NEO (schematic representation)

The KVM matrix switch CATCenter NEO switches the VGA, keyboard, mouse and audio signals. It is designed for larger systems where the servers are accessed from several operator stations. The operator stations can also be distributed between different locations.

In addition to the KVM matrix switch, the CATCenter NEO system also comprises the additional modules required for connecting the servers and operator stations. You will need the following:
- Central unit: KVM matrix switch CATCenter NEO, versions for 4/32, 8/32 or 16/64 (operator stations/servers)
- Operator station unit: user console UCON, versions
- Server unit: server connection dongle CATpro2, versions

Modules of the CATCenter NEO system
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)

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

Modules of the CompactCenter X2 system

Detailed information on the CompactCenter X2 system and its components is available in the Internet at:

www.gdsys.de/CompactCenter.308.0.html
# KVM matrix switches: Flexible operator station administration

## 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></td>
<td></td>
</tr>
<tr>
<td>• Port</td>
<td>Standard VGA interface</td>
<td>Standard VGA interface</td>
</tr>
<tr>
<td>• Max. resolution</td>
<td>• 1920 x 1440 at 60 Hz</td>
<td>• 1920 x 1440 at 60 Hz</td>
</tr>
<tr>
<td>- Analog</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Digital (over IP)</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 or 1920 x 1200 at 60 Hz in accordance with VESA CVT-RB</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></td>
<td></td>
</tr>
<tr>
<td>• Interfaces to computer (CATpro2)</td>
<td>PS/2, USB, SUN-USB, VT100</td>
<td>PS/2, USB, SUN-USB, VT100</td>
</tr>
<tr>
<td>Interfaces to operator station (UCON)</td>
<td>PS/2, USB, SUN-USB</td>
<td>PS/2, USB, SUN-USB</td>
</tr>
<tr>
<td>Audio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Bandwidth</td>
<td>22 kHz</td>
<td></td>
</tr>
</tbody>
</table>

## 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  

Additional information is available in the Internet under:  
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
Operator control and monitoring

SIVICON:
Video web server for process monitoring

Selection and Ordering Data

<table>
<thead>
<tr>
<th>SIVICON basic system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>9AC9 311-4AA20</td>
</tr>
<tr>
<td>9AC9 311-4AA30</td>
</tr>
<tr>
<td>9AC9 311-4AA31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIVICON V400+19&quot; series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>9AC9 311-6AA20</td>
</tr>
<tr>
<td>9AC9 311-6AA30</td>
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<tr>
<td>9AC9 311-6AA31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIVICON V600+19&quot; series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>9AC9 311-8AA20</td>
</tr>
<tr>
<td>9AC9 311-8AA30</td>
</tr>
<tr>
<td>9AC9 311-8AA31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIVICON V800 series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>9AC9 311-10AA10</td>
</tr>
<tr>
<td>9AC9 311-10AA20</td>
</tr>
<tr>
<td>9AC9 311-10AA30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIVICON V1200 series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>9AC9 311-12AA00</td>
</tr>
<tr>
<td>9AC9 311-12AA10</td>
</tr>
<tr>
<td>9AC9 311-12AA20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIVICON V1600 series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>9AC9 311-16AA00</td>
</tr>
<tr>
<td>9AC9 311-16AA10</td>
</tr>
<tr>
<td>9AC9 311-16AA20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIVICON V4000 series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>9AC9 311-4AA00</td>
</tr>
<tr>
<td>9AC9 311-4AA10</td>
</tr>
<tr>
<td>9AC9 311-4AA20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<td>SIVICON video web server update from V4xx to V6xx</td>
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Selection and Ordering Data

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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: 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
Modular local operator stations for hazardous areas

Overview

The CHALLENGER Remote PC Terminal is a local operator station which is powered by an intrinsically-safe supply; it is appropriate for the extreme conditions encountered in the chemical, oil and gas industries, and simultaneously complies with the maximum requirements of the pharmaceutical industry (in accordance with GAMP, GMP, etc.). It can be operated in hazardous areas, Zone 1, 2, 21 or 22.

Each CHALLENGER Remote PC Terminal can be individually designed by configuring with different components for visualization, operation, and access control. Since all operation and visualization components are provided with an intrinsically-safe power supply, integration into specially customized enclosures/clean room panels is easy.

Design

The modular CHALLENGER Remote PC Terminal is a local operator station which replaces the standard display and operating components (keyboard, mouse, monitor) of the SIMATIC PCS 7 operator station. A transmitter unit (TCV2i) transmits the VGA, mouse (PS/2) and keyboard (PS/2) signals via twisted-pair cables (CAT 7) between the processing unit of the SIMATIC PCS 7 operator station (SIMATIC PCS 7 Industrial Workstation) and the CHALLENGER Remote PC Terminal.

Simple and low-cost installation is possible using commercially available cables between PC and transmitter unit and the CAT 7 cable to the CHALLENGER Remote PC Terminal.

The transmitter unit located together with the processing unit in the safe area can transmit signals over distances of up to 600 m without losses in quality.

An additional twisted-pair cable is required to connect an optional card reader/fingerprint or touch screen module.

Enclosure and mounting

- Ergonomic, industrial-design FHP enclosure (without dirt-catching edges)
- Simple mounting options for floor, wall, ceiling
- Customized special enclosure on request
Operator control and monitoring

Modular local operator stations for hazardous areas

**Function**

**Ex approval (depending on version)**
- II 2G / II 3D, EEx ib IIC T4

**International certificates (depending on version)**
- ATEX DMT 00, ATEX E 089
- UL Class I, Zone 1, AEx ib IIC T4
- C-UL Class I, Zone 1, Ex ib IIC T4
- IECEx BVS 05.0006
- GOST-R/GGTN:CTB No. POCC DE.TB04.B00777, EEx ib IIC T4
- TIIS
- NEPSI

**Modular components for use in hazardous areas (IP66/NEMA 4x at front)**
- TFT color display, 15" or 19"
- All display resolutions from 640 x 480 through 1280 x 1024 (with 19") are automatically displayed
- LED high brightness displays for natural-light viewing (max. brightness 1000 cd/m²)
- Touch screen as option (5-wire resistive)
- Transmission range up to 500 m
- For temperature ranges from -10 to +60 °C (expandable to -30 °C)

**Optional Ex components**
- Cable-linked and radio barcode scanners for Zones 1/2/21/22
- Video camera
- RS 232 interfaces
- Universal, intrinsically safe video input (PAL, NTSC, SECAM)

**Power supplies**
- 24 V DC (3 A)
- 100 to 240 V AC (typ. 2 A)

---

**More information**

GECMA Components GmbH
Heisenbergstrasse 26-40
50169 Kerpen
Germany

Phone: +49 2237 6996-0
Fax: +49 2237 6996-99
E-mail: info@gecma.com

Additional information is available in the Internet under:

[www.gecma.com](http://www.gecma.com)
Overview
VisuNet RM (Remote Monitor) are rugged operator stations from Pepperl+Fuchs GmbH for use in harsh, hazardous industrial environments or as GMP versions for regulated industrial sectors in which production procedures and environments are subject to special quality requirements.

The VisuNet RM designed with high IP66 protection (GMP version: IP65) replaces the usual monitor, keyboard and mouse used for display and operation with a SIMATIC PCS 7 industrial workstation. An operator station is thus available for process visualization and control where the processing unit is located in the safe area and spatially separated over standard Ethernet from the display and operation components in the hazardous area. The distance between the VisuNet RM operator station in the hazardous area and the SIMATIC PCS 7 industrial workstation in the safe area can be up to 90 m, or up to 2 km when using an additional glass-fiber extension.

Supplementary components for data transmission such as the KVM (Keyboard Video Mouse) amplifier are not required.

Changes to the architecture of the automation system can be carried out rapidly and easily.

The VisuNet RM product range is highly versatile. The functionality and assembly can thus be matched as required to the application. Versions with touch screen are available, as well as with various display sizes, keyboard layouts and types of mouse. These are available for floor, wall or ceiling mounting, also in versions for swiveling and tilting.

Application
The VisuNet RM operator stations are approved for hazardous areas of Zones 1 and 21 in accordance with the certifications IEC Ex (international), ATEX (Europe), NEPSI (China), GOST-R and GGTN (Russia). This means they are highly suitable for all sectors of the chemical, pharmaceutical and oil&gas industries.

The GMP version corresponds to the quality requirements of the Good Manufacturing Practice directives for regulated industries. It is exceptionally suitable for the pharmaceutical industry as well as for the F&B and fodder industries. Production of scents and flavorings or cosmetics are other possible fields of application.

Technical specifications
<table>
<thead>
<tr>
<th>Specification</th>
<th>VisuNet RM</th>
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<tbody>
<tr>
<td>Approvals</td>
<td>Zone 1 or 21; in accordance with ATEX, IEC Ex, NEPSI, GOST-R, GGTN (GOSGORTECHNADSOR)</td>
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<td>Degree of protection (housing)</td>
<td>IP66 (GMP version: IP65)</td>
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<td>Screen diagonals</td>
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<td>• 1280 x 1024 (19&quot;)</td>
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<td>Interfaces</td>
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<td>• USB, USBI</td>
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<td></td>
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</table>

More information
Pepperl+Fuchs Vertrieb Deutschland GmbH
Lilienthalstrasse 200
D-68307 Mannheim
Germany
Phone: +49 621-776-222
Fax: +49 621-776-27 2222
E-mail: pa-inforde.pepperl-fuchs.com

You can find additional information in the Internet at:
www.pepperl-fuchs.com/hmi
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
  - B5XXMP-XROHS (PS/2)
  - B5XUSB-XROHS (USB)
- Mouse-Trak Industrial for harsh environmental requirements
  (see figure)
  - BMPIND-XROHS (PS/2)
  - BUSBID-XROHS (USB)
The Siemens Fingerprint Mouse can be used as a logon device for SIMATIC Logon, the central user management function with access control for the system components of SIMATIC PCS 7. The driver software required to link the Siemens Fingerprint Mouse to SIMATIC Logon is included in the delivery. A USB port on the client or on the SIMATIC PCS 7 single station is required for the hardware connection.

Using the Siemens Fingerprint Mouse as a logon device for SIMATIC Logon enables quick and unambiguous identification of SIMATIC PCS 7 system operators with their fingerprint. The fingerprint information is stored in encrypted form in the database. The setup of a new user is menu-driven and takes only a few seconds.

**Note:** The Siemens Fingerprint Mouse can be used with SIMATIC PCS 7 V6 and V7 as a logon device for SIMATIC Logon.
Overview

The Operator’s ToolSet (OTS) is a collection of practical tools matched to one another. These tools increase the efficiency during commissioning, operation, maintenance and documentation of plants based on the SIMATIC PCS 7 process control system.

The OTS products OTS Suite, OTS Shift Book and OTS Document Management System can be used individually or in combination. Their features include:

- Redundancy
- Web capability
- Flexibility
- Adaptability

Its development was based on many years of practical experience gained from numerous customer projects in various industries, and considers the demands and requirements of many owners of process engineering plants. During the continuous development, we placed great importance on the intensive information exchange with plant owners.

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

Benefits

Comprehensive, user-specific information, an increase in fail-safety, and a reduction in downtimes enable plant owners to save valuable time without having to possess programming know-how or apply special knowledge. Mountains of paper belong to the past. Decisions can be made at an early point in time, and problems solved more rapidly and efficiently.

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 information system
2. Collect archive value (measuring point) using the curve collector
3. Add archive value (measuring point) to the curve group system
4. List of documents linked to the object

OTS Suite: Curve collector & curve group system – a source of plant safety

The curve collector is comparable with a shopping basket which can be filled with up to 10 measuring points from different parts of the plant. This step is simply carried out by clicking in the process image; it does not require any special SIMATIC PCS 7 knowledge.

The collected values can be subsequently displayed in the curve group system. The settings of the measuring point, e.g., name or measuring unit, are imported at the same time, and automatically considered in the curve display.

The curve group system expands the SIMATIC PCS 7 TrendControl by simple parameterization and configuration options, for example, and by a calendar function for fast calling of archive values. It is used for simple display and management of curve groups. In addition to the standard plant curves which are saved in the plant’s technological hierarchy, users can apply the curve collector or object finder to conveniently combine and open their own “private” curve groups. The priorities differ here depending on the task area and experience, and therefore the curve group system is appropriately flexible and offers different privilege levels.

The curve collector and curve group system increase plant safety and are very popular. Simultaneous display of trends for various measured values, fast opening of existing curve groups, and the creation of new curve groups depending on the situation enable operators to recognize in time that a plant component could fail.
Operator control and monitoring

Operator’s ToolSet

OTS Suite: Object finder
Fast navigation in the process images through:

• Project-wide search for objects and measuring points by entering a search term
• Fast overview of searched objects
• Changing to process image of a selected object by clicking with mouse
• Adding objects with linked archive tag (measuring point) to curve groups or to the curve collector
• Export of result list for documentation updating in HTML or CSV format

OTS shift book and object information system – for fast and simple information
Information is no longer passed on (as previously the case) using a written note directly on the equipment or in the control room. The object information system and the clear OTS shift book allows colleagues to be informed of all plant events much simpler and faster, to delegate tasks, and to track events. The recording and management of all information and instructions is carried out for all shifts together and throughout the company.

OTS shift book and object information system are directed to different target groups. Plant operators responsible for specific areas or equipment primarily use the object information system. Shift engineers and plant managers use the OTS shift book on the SIMATIC PCS 7 OS client or on their computer in the office to gain an up-to-date overview of the status of the complete plant.

The object information system allows intuitive recording of messages and reports directly on the object in the process image without special plant knowledge. Stored information can be called simply by clicking on the Info Object – in contrast to a written note, there is no time limit, a status ID is provided, and the information is suitable for printing. All important information is thus always available at the position it is required. Exceptional events can be communicated throughout the plant as "special information". Signaling is carried out both in the toolbar and in the process image. The operator is guided directly to the associated object in a manner similar to the loop-in-alarm function.

The shift book is a "knowledge database" in which all information is recorded uniformly and displayed in views with different structures. Information for troubleshooting or for additional optimization of working procedures can then be found rapidly when required.

Communication problems thus belong to the past, and technical problems can be solved more rapidly. In contrast to the object information system, reports on non-process objects or plant areas can also be created in the shift book, and selected reports can be printed and exported.

OTS Document Management System – documentation at the right location

Main window of the OTS document management system
The process-specific OTS Document Management System (OTS-DMS) puts a stop to mountains of paper and time-consuming searching for documents. It allows convenient organization of electronic documents of any type, and makes them easy to find again. The documents are available rapidly and reliably to every station in the network via central document servers.

Linking of the SIMATIC PCS 7 operator system allows assignments to be made to process objects so that the linked documents can be opened directly from the process image. The OTS-DMS can also be executed on computers which do not contain SIMATIC PCS 7 OS software.
Scope of functions of the OTS DMS:
- Management of documents in original format
- Archiving of documents in a freely-definable folder structure (analogous to Microsoft Windows Explorer)
- Creation of new documents, or adding of existing ones
- Creation of new templates, based on which new documents can be created
- Scanner function for digitization and addition of documents
- Various views
- Simple document searching or filtering, e.g. according to type, name, process object, contact or keyword
- Linking of documents, e.g. using keywords or process objects
- Opening of documents linked to process objects directly from the process image
- User privilege system provides access control as protection against unauthorized viewing
- Version management makes it easier to comprehend the complete document lifecycle

Technical specifications

System requirements
Operating system (alternatives)
- Windows 2000 Professional/2000 Server
- Windows XP Professional + SP1/SP2/SP3
- Windows 2003 Server/Windows 2003 Server R2 +SP2

Process control system
- SIMATIC PCS 7 V6 or V7

More information
GreyLogix GmbH
Conrad-Röntgen-Str. 1
24941 Flensburg
Germany
Phone: +49 461 50 54 87-998
Fax: +49 461 50 54 87-100
E-mail: info@operators-toolset.com

Additional information is available in the Internet under:
www.operators-toolset.com
6 Libraries/blocks/tools

| 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 |
| 6/6   | PST for SIMATIC PCS 7: Partial Stroke Test |
| 6/8   | AS-i block library for SIMATIC PCS 7 |
| 6/10  | Gas analysis library for SIMATIC PCS 7 |
| 6/11  | PumpMon for SIMATIC PCS 7: Condition monitoring for centrifugal pumps |
| 6/13  | IEC 61850 libraries for integration of protective equipment in 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 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 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 variable 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

Actemium
Controlmatic
Hegenheimer Str. 4
79576 Weil am Rhein
Germany

Phone: +49 7621 6603-0
E-mail: pcs7.mfl@actemium.de

You can find additional information in the Internet at:

www.actemium.de
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”.

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>Description</th>
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<tbody>
<tr>
<td>9AE4 210-1AA00</td>
<td>PTE400 V7.1 block library with process technology elements for SIMATIC PCS 7 V7.1. This includes function blocks and faceplates, electronic documentation, as well as engineering and runtime licenses for one AS 414, AS 416 or AS 417 automation system. The type of delivery is software and electronic documentation on CD, engineering and runtime license.</td>
</tr>
<tr>
<td>9AE4 210-2AB00</td>
<td>PTE400 block library - Project upgrade to V7.1. This block library includes function blocks and faceplates, as well as electronic documentation (ID No. of block library to be upgraded required). The engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation is also included. The type of delivery is software and electronic documentation on CD.</td>
</tr>
<tr>
<td>9AE4 200-8GB00-0DD0</td>
<td>PTE400 V6.1 block library with process technology elements for SIMATIC PCS 7 V6.1/V7.0. This includes function blocks and faceplates, electronic documentation, as well as engineering license for one project and runtime license for an AS 414, AS 416 or AS 417 automation system. The type of delivery is software and electronic documentation on CD, engineering and runtime license.</td>
</tr>
<tr>
<td>9AE4 200-2GB10-1DD0</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), this includes runtime software, software class A, 2 languages (German, English), single license for 1 installation. The type of delivery is runtime license.</td>
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<tr>
<td>9AE4 200-8GB04-0BD0</td>
<td>PTE400 block library - Project upgrade to V6.1/V7.0. This block library includes function blocks and faceplates, as well as electronic documentation (ID No. of block library to be upgraded required). The engineering and runtime software, software class A, 2 languages (German, English), single license for 1 installation is also included. The type of delivery is software and electronic documentation on CD.</td>
</tr>
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C) Subject to export regulations: AL: N, ECCN: EAR99S

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## More Information

Siemens AG  
Industry Sector  
Industry Solutions Division  
Industrial Technologies  
Karlsruhe  
Phone: +49 721 595-6380  
Fax: +49 721 595-6383  
E-mail: function.blocks.industry@siemens.com  
You can find additional information in the Internet at:  
[www.siemens.de/PTE400](http://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

Selection and Ordering Data

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.

More information

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Overview

Configuration example of the Partial Stroke Test

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.

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.
Partial Stroke Tests extend the interval between Full Stroke Tests from one year to two years.

**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.

**Selection and Ordering Data**

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

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

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Partial Stroke Test (PST) with S7-400FH and SIMATIC PCS 7 (V6.1, V7.0 or V7.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6BQ2 001-0CB11-0AA0</td>
<td>Runtime license for an additional AS, 1 language (English)</td>
</tr>
<tr>
<td></td>
<td>Runtime software, software class A</td>
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<tr>
<td></td>
<td>Type of delivery: Single License for 1 installation</td>
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</tbody>
</table>

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The AS-Interface 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 shielded 2-wire cable.

The AS-Interface (AS-i) is extremely easy to integrate in the SIMATIC PCS 7 process control system by using the SIMATIC PCS 7 AS-i block library. Significant advantages of the AS-i then come into effect, such as

• Easy installation
• Low wiring requirements even when using simple digital actuators and sensors with SIMATIC PCS 7

The AS-i 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 configuring.

Note:
You can use the AS-i block library in systems with SIMATIC PCS 7 V6.1 and V7.0.

AS-i block library for SIMATIC PCS 7

Overview

The AS-Interface operates according to the master/slave principle. The AS-i master module which can be used in an ET 200M remote I/O station on the PROFIBUS controls the slaves (sensors/actuators) connected per AS-i line.

Supported AS-i devices

AS-i master
The AS-i block library for SIMATIC PCS 7 supports the AS-i master CP 343-2 and CP 343-2P used in the ET 200M remote I/O station on the PROFIBUS.

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.

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.

Design

The SIMATIC PCS 7 AS-i block library 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.
### Selection and Ordering Data

<table>
<thead>
<tr>
<th>AS-i block library for SIMATIC PCS 7 V6.1 and V7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>3ZS1 635-1XX00-0YA0 (E)</td>
</tr>
</tbody>
</table>

**AS-i block library**
AS blocks and faceplate for integration of AS-Interface (digital AS-i slaves on the AS-i masters CP 343 2 and CP 343 2P) in SIMATIC PCS V6.1 and 7.0, 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

<table>
<thead>
<tr>
<th>AS runtime license for SIMATIC PCS 7 AS-i block library</th>
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</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
</tr>
<tr>
<td>3ZS1 635-2XX00-0YB0 (E)</td>
</tr>
</tbody>
</table>

for one automation system each (SIMATIC PCS 7 AS-i block library 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

---

**More information**

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You can find additional information in the Internet at:  
[www.siemens.de/as-interface](http://www.siemens.de/as-interface)

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E) Subject to export regulations: AL: N, ECCN: 5D992
Gas analysis library for SIMATIC PCS 7

Overview

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

Order No.

Gas analysis library for SIMATIC PCS 7 V6 and V7

Gas analysis library for SIMATIC PCS 7

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

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

9AE4 110-3AB00

C) Subject to export regulations: AL: N, ECCN: EAR99S

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You can find additional information in the Internet at:

www.siemens.de/PCS7_Treiberbausteine
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.
### PumpMon for SIMATIC PCS 7: Condition monitoring for centrifugal pumps

#### Selection and Ordering Data

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

C) Subject to export regulations: AL: N, ECCN: EAR99S

#### More information

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IEC 61850 libraries for integration of protective equipment in SIMATIC PCS 7

Overview

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. SİPROTEC 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.

Application

The 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. SİPROTEC. 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
## Selection and Ordering Data

<table>
<thead>
<tr>
<th>IEC 61850 communication block library for SIMATIC PCS 7</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 61850 communication block library for SIMATIC PCS 7</td>
<td>9AE4 110-1AA20</td>
</tr>
</tbody>
</table>

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. Engineering and runtime software, software class A, 2 languages (German, English), plant license (naming of plant is necessary). Type of delivery: Software and electronic documentation on CD, engineering and runtime license.

### IEC 61850 device library for SIMATIC PCS 7

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. Engineering and runtime software, software class A, 2 languages (German, English), plant license (naming of plant is necessary). Type of delivery: Software and electronic documentation on CD, engineering and runtime license.

<table>
<thead>
<tr>
<th>IEC 61850 device library for SIMATIC PCS 7</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>IEC 61850 device library for SIMATIC PCS 7</td>
<td>9AE4 110-2AA00</td>
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</tbody>
</table>

### More information

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C) Subject to export regulations: AL: N, ECCN: EAR99S
Distributed I/O on the PROFIBUS

7/2 Function blocks for SIWAREX weighing modules
7/3 Drive ES PCS 7: Function blocks for drives
7/5 PCS 7 SIMOCODE pro: Function block library for the motor management system
7/7 AddFEM: Redundant I/O module for fast response times
7/10 Field barrier "-FB-Ex4.": Intrinsically-safe distribution block
7/12 AirLINE Ex: Pneumatic block for integration into ET 200iSP
7/14 SIMATIC RF: RFID systems
7/15 KSB PumpDrive for SIMATIC PCS 7: Speed control for centrifugal pumps
Distributed I/O on the PROFIBUS

**Function blocks for SIWAREX weighing modules**

**Overview**

PCS 7 Add-on fit for SIMATIC PCS 7 V7

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 rational integration of the SIWAREX U/FTA/FTC weighing modules into the engineering system, but also 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 V6 (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**

**SIWAREX U configuration package**
Consisting of:
- Function block, faceplate, parameterizing software and manual, 2 languages (German, English), engineering license for SIWAREX U, single license for 1 installation
- Engineering and runtime software, software class A
- Type of delivery: Software and electronic documentation on CD, engineering license (certificate of license)
- For SIMATIC PCS 7 V7.0 and V7.1 suitable for 7MH4 950-1AA01 and 7MH4 950-2AA01
- For SIMATIC PCS 7 V6.0 and V6.1

<table>
<thead>
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<th>Order No.</th>
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<tbody>
<tr>
<td>7MH4 950-3AK61</td>
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</tbody>
</table>

**SIWAREX FTC configuration package**
Consisting of:
- Function block, faceplate, parameterizing software and manual, 2 languages (German, English), engineering license for SIWAREX FTA, single license for 1 installation
- Engineering and runtime software, software class A
- Type of delivery: Software and electronic documentation on CD, engineering license (certificate of license)
- For SIMATIC PCS 7 V7.0 and V7.1
- For SIMATIC PCS 7 V6.0 and V6.1

<table>
<thead>
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<th>Order No.</th>
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<tbody>
<tr>
<td>7MH4 900-2AK62</td>
</tr>
<tr>
<td>7MH4 900-2AK61</td>
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</tbody>
</table>

**SIWAREX FTC_B configuration package** (belt scales)
Consisting of:
- Function block, faceplate, parameterizing software and manual, 2 languages (German, English), engineering license for SIWAREX FTC, single license for 1 installation
- Engineering and runtime software, software class A
- Type of delivery: Software and electronic documentation on CD, engineering license (certificate of license)
- For SIMATIC PCS 7 V7.0 and V7.1
- For SIMATIC PCS 7 V6.0 and V6.1

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<th>Order No.</th>
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<tr>
<td>7MH4 900-3AK63</td>
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<tr>
<td>7MH4 900-3AK61</td>
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</tbody>
</table>

**SIWAREX FTC_L configuration package** (loss-in-weight scales)
Consisting of:
- Function block, faceplate, parameterizing software and manual, 2 languages (German, English), engineering license for SIWAREX FTC, single license for 1 installation
- Engineering and runtime software, software class A
- Type of delivery: Software and electronic documentation on CD, engineering license (certificate of license)

<table>
<thead>
<tr>
<th>Order No.</th>
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</thead>
<tbody>
<tr>
<td>7MH4 900-3AK64</td>
</tr>
</tbody>
</table>

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www.siemens.com/siwarex
Overview

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.

Application

Drive ES PCS 7 can integrate the following drive series into SIMATIC PCS 7:

- SIMOVERT MASTERDRIVES VC and MC
- MICROMASTER 3rd and 4th generation
- SIMOREG DC Master
- SINAMICS S120/150, G130/150, GM150 and GL150
- SINAMICS G120 (with CU240 V6.0/V6.1 and higher + SP2; with CU230 V7.0 SP1 and higher)

More details on supported CU and firmware versions of the listed drive series can be found in the current information on the associated Drive ES PCS 7 versions under Siemens Service&Support on the Internet.

MASTERDRIVES

The MASTERDRIVES series of converters is integrated and modular. The power range extends from 0.55 to 2 300 kW. All standard international line voltages from 200 to 690 V are covered. Four different enclosure versions are available, depending on the application and required performance: Compact Plus, compact device, built-in unit and cabinet unit. MASTERDRIVES converters are also suitable for demanding technological and dynamic applications.

Drive ES PCS 7: Function blocks for drives

MICROMASTER

MICROMASTER inverters are standard frequency converters in the power range from 0.12 to 250 kW and can be used in numerous variable-speed drive applications. They are especially suitable for applications with pumps, fans and in conveyor systems. Their large range of line voltages enables them to be used all over the world.

SIMOREG DC Master

The SIMOREG DC Master is a converter series for controlling DC motors designed for a power range from 6.3 to 2 000 kW and voltages from 400 to 830 V. They are very dynamic and can therefore also be used for demanding technical applications.

SINAMICS

SINAMICS is the new family of drives from Siemens for innovative and future-oriented drive solutions in a wide power range from 0.12 to 1 200 kW with line voltages from 380 to 690 V. Characteristic of the devices from the SINAMICS family which are based on a shared platform concept is their integrated functionality, high degree of flexibility, and facility for combination.

SINAMICS S

The SINAMICS S120 drive system is a modular system for high-performance applications in industrial machine construction and plant engineering. A wide range of matched designs, components and functions always allows an optimum solution to be found. SINAMICS S120 can be used to implement powerful single drives and coordinated drives (multi-axis applications) with vector or servo functionality.

SINAMICS S150 are designed as cabinet units for variable-speed drives in machine construction and plant engineering. They are particularly suitable for variable-speed drives with high requirements placed on dynamic response and speed accuracy, frequent braking cycles with high braking energies, and four-quadrant operation.

SINAMICS G

SINAMICS G single drives (AC/AC converters) are specialists for all applications where solid, liquid or gaseous materials have to be moved, transported, pumped or compressed through the use of conveyor belts, pumps, fans and compressors.

SINAMICS G120 can be used in all applications as a modular single drive for small to medium powers (0.37 to 90 kW). SINAMICS G130 built-in units and SINAMICS G150 cabinet units for powers from 75 to 800 kW round off the top power range.
Distributed I/O on the PROFIBUS

Drive ES PCS 7: Function blocks for drives

Selection and Ordering Data

**Drive ES PCS 7 and Drive ES Basic configuration software for SIMATIC PCS 7**

**Drive ES PCS 7**
Function blocks and faceplates for integration of SIMOVERT MASTERDRIVES, MICROMASTER, SIMOREG DC-MASTER, and SINAMICS S/G variable-speed drives into SIMATIC PCS 7; with electronic documentation (5 languages)
- Engineering license for one engineering station
- Runtime license for one automation system
Engineering and runtime software, software class A, 5 languages (German, English, French, Italian, Spanish), single license for 1 installation
Type of delivery: certificates of license; software and electronic documentation on CD
- For SIMATIC PCS 7 V7.1
  - 6SW1 700-7JD00-1AA0
- For SIMATIC PCS 7 V7.0
  - 6SW1 700-7JD00-0AA0
- For SIMATIC PCS 7 V6.1
  - 6SW1 700-6JD00-1AA0
- For SIMATIC PCS 7 V6.0
  - 6SW1 700-6JD00-0AA0

**AS runtime license Drive ES PCS 7 for SIMATIC PCS 7 V6.0, V6.1, V7.0 and V7.1**
For processing of function blocks in an automation system
Runtime software, software class A, 5 languages (German, English, French, Italian, Spanish), single license for 1 installation
Type of delivery: certificate of license

**Drive ES Basic configuration software**
Software package for easy parameterization, commissioning and diagnostics of all Siemens drives from a central engineering station; including routing beyond network boundaries; with electronic documentation (5 languages)
Engineering software, software class A, 5 languages (German, English, French, Italian, Spanish), floating license for 1 user
Type of delivery: certificate of license; software and electronic documentation on CD/DVD
- For SIMATIC PCS 7 V7.0 and V7.1 (DVD)
  - 6SW1 700-5JA00-4AA0
- For SIMATIC PCS 7 V6.0 and V6.1 (CD)
  - 6SW1 700-5JA00-3AA0

Selection and Ordering Data

**Upgrade and software update service**

**Drive ES PCS 7 upgrade**
- Engineering license for one engineering station
- Runtime license for one automation system
Engineering and runtime software, software class A, 5 languages (German, English, French, Italian, Spanish), single license for 1 installation
Type of delivery: certificates of license; software and electronic documentation on CD
- From V6.x/V7.0 to V7.1
  - 6SW1 700-7JD00-1AA4
- From V6.x to V7.0
  - 6SW1 700-7JD00-0AA4
- From V5.x/V6.0 to V6.1
  - 6SW1 700-6JD00-1AA4
- From V5.x to V6.0
  - 6SW1 700-6JD00-0AA4

**Software update service**
Contract for the delivery of all updates/upgrades for 1 year; if not canceled, the contract is automatically extended for one more year
Type of delivery: Written contract
- Drive ES PCS 7
  - 6SW1 700-0JD00-0AB2
- Drive ES Basic configuration software for SIMATIC PCS 7
  - 6SW1 700-0JA00-0AB2

More information

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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 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

**SIMATIC PCS 7 block library SIMOCODE pro**
AS modules and faceplates for integrating SIMOCODE pro into SIMATIC PCS 7 with:
- Engineering license for one engineering station
- Runtime license for one automation system

Engineering and runtime software, software class A, 3 languages (German, English, French), single license for 1 installation

Type of delivery: certificates of license; software and electronic documentation on CD

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3UF7 982-0AA00-0</td>
<td>V6.0 for SIMATIC PCS 7 V6.0</td>
</tr>
<tr>
<td>3UF7 982-0AA02-0</td>
<td>V6.1 for SIMATIC PCS 7 V6.1</td>
</tr>
<tr>
<td>3UF7 982-0AA10-0</td>
<td>V7.0 for SIMATIC PCS 7 V7.0/V7.1</td>
</tr>
<tr>
<td>3UF7 982-0AA13-0</td>
<td>Upgrade from V6.0/V6.1 to V7.0</td>
</tr>
</tbody>
</table>

**SIMATIC PCS 7 AS Runtime license SIMOCODE pro**
for execution of AS blocks for SIMOCODE pro in an automation system

Runtime software, software class A, 3 languages (German, English, French), single license for 1 installation

Type of delivery: certificate of license

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3UF7 982-0AA01-0</td>
<td>V6.x for SIMATIC PCS 7 V6.0/V6.1</td>
</tr>
<tr>
<td>3UF7 982-0AA11-0</td>
<td>V7.x for SIMATIC PCS 7 V7.0/V7.1</td>
</tr>
</tbody>
</table>

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### More information

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Fax: +49 911 895 5907
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Additional information is available on the Internet at: [www.siemens.com/simocode](http://www.siemens.com/simocode)
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.

In addition to the AddFEM basic version, the product range also comprises special product versions implemented with an intelligent front end function (FEF) (AddFEM SoE) or based on a stand-alone hardware (AddFEM HART):

- AddFEM SoE (Sequence of Event) has 31 digital inputs with highly accurate time tagging.
- AddFEM HART is a redundant I/O module for operation with sensors and actuators with HART capability.

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

Benefits

- The redundantly operable AddFEM has particularly fast response times for signal recording, processing and redundancy switching (switchover time less than 500 μs).
- The AddFEM has extended level ranges for analog signals and counters.
- The analog and digital areas are electrically isolated from one another.
- All outputs are monitored and can be switched in parallel with other outputs (redundancy, performance increase).
- Analog and digital outputs are permanently short-circuit-proof.

Design

Built into a rugged high-grade steel housing, which is in line with the SIMATIC ST 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

The AddFEM is equipped with the following process connections:

- 12 analog inputs
- 8 analog outputs
- 12 digital inputs
- 3 counter/timer inputs (can also be configured as digital inputs)
- 16 digital outputs (can also be configured as digital inputs)

The AddFEM SoE has:

- 31 digital inputs with time tagging

The AddFEM HART has:

- 24 analog inputs with HART capability
- 8 analog outputs with HART capability
- 8 power supplies for four-wire transmitters (can alternatively be used as digital outputs)

The various signal types are distributed across the process connections in such a way that small applications can be executed with a single module. 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 when using the AddFEM, e.g. for turbine controllers, 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.

The 24 analog inputs and 8 analog outputs of the AddFEM HART are recorded and output in a fast cycle of 833 μs. Transmission of additional signals via HART protocol and monitoring of the transmitters are carried out parallel to this in a 2-s cycle. The AddFEM HART is integrated in SIMATIC PDM and in the PCS 7 Asset Management.
### Technical specifications

**AddFEM/AddFEM SoE**

<table>
<thead>
<tr>
<th><strong>General data</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (H x W x D) in mm</td>
<td>295 x 75 x 209</td>
</tr>
<tr>
<td>Weight</td>
<td>2.8 kg</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Bridging of power failures</td>
<td>10 ms (minimum)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>20 W</td>
</tr>
</tbody>
</table>

**PROFIBUS DP interfaces**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of interfaces</td>
<td>2</td>
</tr>
<tr>
<td>Baud rate</td>
<td>12 Mbit/s</td>
</tr>
<tr>
<td>Max. cable length of a bus segment</td>
<td>100 m</td>
</tr>
<tr>
<td>Connectable load per interface</td>
<td>5 V, max. 80 mA</td>
</tr>
</tbody>
</table>

**Digital inputs (parameterizable)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>12</td>
</tr>
<tr>
<td>Type of input</td>
<td>Type 1 compliant with IEC 1131-2</td>
</tr>
<tr>
<td>Voltage range</td>
<td>-30 ... +33 V DC</td>
</tr>
<tr>
<td>0 signal level</td>
<td>-30 ... +5 V DC</td>
</tr>
<tr>
<td>1 signal level</td>
<td>+11 ... +30 V DC</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>3 groups of 4 digital inputs each</td>
</tr>
<tr>
<td>Display</td>
<td>LED in display panel</td>
</tr>
</tbody>
</table>

**Digital outputs (parameterizable)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>16</td>
</tr>
<tr>
<td>Type of output</td>
<td>Digital semiconductor outputs</td>
</tr>
<tr>
<td>Nominal output voltage</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Output voltage with 0 signal</td>
<td>&lt; 1 V</td>
</tr>
<tr>
<td>Output voltage with 1 signal</td>
<td>Power supply less 2 V</td>
</tr>
<tr>
<td>Rated output current</td>
<td>500 mA</td>
</tr>
<tr>
<td>Short-circuit proof</td>
<td>Yes</td>
</tr>
<tr>
<td>Short-circuit-to-ground monitoring</td>
<td>Yes (internal monitoring)</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>Yes (8 outputs each with same reference potential)</td>
</tr>
</tbody>
</table>

**Analogue inputs (parameterizable)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs, total</td>
<td>12</td>
</tr>
<tr>
<td>Current input (fixed)</td>
<td>6</td>
</tr>
<tr>
<td>Current/voltage input</td>
<td>6</td>
</tr>
<tr>
<td>Measuring range of current inputs (parameterizable)</td>
<td>0 ... 20 mA</td>
</tr>
<tr>
<td></td>
<td>4 ... 20 mA</td>
</tr>
<tr>
<td></td>
<td>-30 ... +30 mA</td>
</tr>
<tr>
<td>Measuring range of voltage input (parameterizable)</td>
<td>0 ... 10 V</td>
</tr>
<tr>
<td></td>
<td>-10 ... +10 V</td>
</tr>
<tr>
<td>Input impedance, current</td>
<td>41.8 Ω</td>
</tr>
<tr>
<td>Input impedance, voltage</td>
<td>100 kΩ</td>
</tr>
<tr>
<td>Max. faults (over the entire temperature range)</td>
<td>0.2% relative to full-scale value</td>
</tr>
<tr>
<td>Resolution of A/D converter</td>
<td>13 bit + sign</td>
</tr>
</tbody>
</table>

**AddFEM SoE**

### Analog outputs (parameterizable)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs, total</td>
<td>8</td>
</tr>
<tr>
<td>Current output range</td>
<td>0 ... 20 mA (500 Ω)</td>
</tr>
<tr>
<td>Unipolar</td>
<td>4 ... 20 mA (500 Ω)</td>
</tr>
<tr>
<td>Current output range</td>
<td>±20 mA (500 Ω)</td>
</tr>
<tr>
<td>Bipolar</td>
<td>±50 mA (300 Ω)</td>
</tr>
<tr>
<td>Max. faults (over the entire temperature range)</td>
<td>0.4%</td>
</tr>
<tr>
<td>Resolution of A/D converter</td>
<td>13 bit + sign</td>
</tr>
</tbody>
</table>

**Counting pulse input (parameterizable)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs</td>
<td>3</td>
</tr>
<tr>
<td>Type of input</td>
<td>Type 1/2 compliant with IEC 1131-2</td>
</tr>
<tr>
<td>Voltage range</td>
<td>±33 V DC</td>
</tr>
<tr>
<td>0 signal level</td>
<td>-28 ... +3V</td>
</tr>
<tr>
<td>1 signal level</td>
<td>+8 ... +28 V</td>
</tr>
<tr>
<td>Load</td>
<td>1 ... 3 kΩ</td>
</tr>
<tr>
<td>Input frequency (f_in)</td>
<td>0 ... 20 kHz</td>
</tr>
<tr>
<td>Counter resolution</td>
<td>1/80 000 referred to measured value</td>
</tr>
<tr>
<td>Updating interval</td>
<td>2 ms</td>
</tr>
</tbody>
</table>

**Digital inputs with time tagging:**

**AddFEM SoE**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>31</td>
</tr>
<tr>
<td>Time resolution</td>
<td>1 ms</td>
</tr>
</tbody>
</table>

### 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
**Technical specifications**

**AddFEM HART**

**General data**
- Dimensions (H x W x D) in mm: 295 x 75 x 209
- Weight: 2.8 kg
- Power supply: 24 V DC
- Power consumption: 20 W

**Profibus DP interfaces**
- Number of interfaces: 2
- Baud rate: 11 Mbit/s
- Max. cable length of a bus segment: 100 m
- Connectable load per interface: 5 V, max. 80 mA

**Power supply for transmitters with four-wire system**
- Quantity: 8
- 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 1 V
- Rated output current: 500 mA
- Rated output current with 100% demand factor: 250 mA

**Analog inputs (parameterizable)**
- Current inputs: 24
- Measuring range of current inputs (parameterizable): 0 ... 20 mA / 4 ... 20 mA
- Input impedance, current: 230 W
- Max. faults (over the entire temperature range): 0.25 % relative to full-scale value
- Resolution of A/D converter: 14 bit + sign
- Conversion method: Successive approximation

**Analog outputs (parameterizable)**
- Current outputs: 8
- Current output range: 0 ... 20 mA / 4 ... 20 mA
- Max. faults (over the entire temperature range): 0.4 %
- Resolution of D/A converter: 14 bit + sign

**HART protocol**
- HART specification: Rev 6.0

**Approvals/markings**
- cULus approval
- Underwriters Laboratories (UL) compliant with Standard UL 508
- CE marking (Compliant with EU directive 89/336/EEC "Electromagnetic compatibility"
- cULus hazardous locations approval
- FM approval
- ATEX certification
- ATEX certification Zone 2 to EN 50021 compliant with EU directive 94/9/EEC (explosion protection)
- Quality assurance: According to ISO 9001

**Selection and Ordering Data**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6DL3 100-8AC</td>
<td>Front End Module AddFEM Redundant PROFIBUS DP I/O module for fast response times, operable on automation systems of the SIMATIC PCS 7 V6/V7 process control system</td>
</tr>
<tr>
<td>6DL3 100-8AC03</td>
<td>Front End Module AddFEM SoE Redundant PROFIBUS DP I/O module for highly exact time stamping, operable on automation systems of the SIMATIC PCS 7 V6/V7 process control system</td>
</tr>
<tr>
<td>6DL3 200-8AA</td>
<td>Front End Module AddFEM HART Redundant PROFIBUS DP I/O module for AI/AO with HART capability, operable on automation systems of the SIMATIC PCS 7 V6/V7 process control system</td>
</tr>
<tr>
<td>6DL9 900-8AA</td>
<td>Connection elements for AddFEM Connector set</td>
</tr>
<tr>
<td>6DL9 901-8AA</td>
<td>Redundant connection Fiber-optic cable 1.6 m</td>
</tr>
</tbody>
</table>

**More information**

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Fax: +49 721 595-6525  
E-mail: addon_s2.aud@siemens.com
**Field barrier *-FB-Ex4.*: Intrinsically-safe distribution block**

**Overview**

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 [www.pepperl-fuchs.com/cps/dde/xchg/global/hs.xsl/454_fieldbarriers.htm](http://www.pepperl-fuchs.com/cps/dde/xchg/global/hs.xsl/454_fieldbarriers.htm)
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

Block diagram of "-FB-Ex4.*" field barrier

More information

Pepperl+Fuchs GmbH
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Germany
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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
Overview

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

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).
**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></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>
</tr>
<tr>
<td>Pressure range</td>
<td>0 … 8 bar</td>
</tr>
<tr>
<td>Ambient temperature in operation</td>
<td></td>
</tr>
<tr>
<td>• Horizontal installation</td>
<td>0 … 55 °C</td>
</tr>
<tr>
<td>• All other mounting positions</td>
<td>0 … 50 °C</td>
</tr>
<tr>
<td>Ambient temperature during storage</td>
<td>-40 … +70 °C</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP30</td>
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<tr>
<td>Approvals</td>
<td>ATEX, IEC, FM, CSA</td>
</tr>
<tr>
<td></td>
<td>II 2G Ex ia/ib IIC T4</td>
</tr>
<tr>
<td></td>
<td>Class 1 Div.2 ABCD T4</td>
</tr>
</tbody>
</table>
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.

**Design**
The SIMATIC RF RFID systems consist of matched individual components whose function and performance vary depending on the task:
- Mobile data carriers (tags)
- Read/write devices and mobile handheld terminals
- Antennas
- Interface modules for the connection to the automation system
- Software for system integration

Integration of the SIMATIC RF RFID systems into the SIMATIC PCS 7 process control system is possible in various manners. The RFID readers of the RF300, RF600, MOBY D/E/U systems are linked with the process control system using ASM 456 and ASM 475/ET 200M communication modules. ASM 456 and ASM 475/ET 200M communicate via PROFIBUS with the SIMATIC PCS 7 automation system.

**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**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6GT2 002-0ED00</td>
<td>ASM 456 communication module For connecting two read devices directly to PROFIBUS</td>
</tr>
<tr>
<td>6GT2 002-0GA10</td>
<td>ASM 475 communication module For SIMATIC S7-300 and ET 200M; for connecting two read devices</td>
</tr>
<tr>
<td>6GT2 080-2AA10</td>
<td>RFID Systems Software &amp; Documentation 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>
</tr>
</tbody>
</table>

B) Subject to export regulations: AL: N, ECCN: EAR99H

**More Information**
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Industry Sector
Industry Automation Division
Sensors and Communication
Nuremberg
Phone: +49 911 895 5775
Fax: +49 911 895 2725
E-mail: ac.sensors.simatic@siemens.com

You can find additional information in the Internet at: www.siemens.com/simatic-sensors/rfid
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
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
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<tbody>
<tr>
<td>8/2</td>
<td>Introduction</td>
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<tr>
<td>8/3</td>
<td>SIMBApro FAT:</td>
</tr>
<tr>
<td></td>
<td>Fieldbus simulation with</td>
</tr>
<tr>
<td></td>
<td>Factory Acceptance Test</td>
</tr>
<tr>
<td>8/6</td>
<td>SIMIT:</td>
</tr>
<tr>
<td></td>
<td>Simulation-based engineering</td>
</tr>
</tbody>
</table>
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.

**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
Simulation

SIMBApro FAT: Fieldbus simulation with Factory Acceptance Test

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

Function

SIMBApro FAT is able, with SIMBA Profinus, 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.

Design

SIMBA Profinibus comprises the following components:
- External SIMBA Profinibus module with 2, 4 or 8 channels
- Configuration and diagnostics software for standard PC
- Electronic documentation in HTML format

The SIMBA Profinibus 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 Profinibus 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 Profinibus modules over the standard Ethernet network interface. The software can be used to configure the SIMBA Profinibus modules and to implement simple simulation functions for equipment.

Technical specifications
- Baud rate of PROFIBUS DP: max. 12 Mbit/s
- SIMBA Profinibus 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 Profinibus 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
## Selection and Ordering Data

### SIMBA Profinet

<table>
<thead>
<tr>
<th>Order No.</th>
<th>2-channel for 2 PROFIBUS lines with max. 125 PROFIBUS DP slaves each</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AE4 122-1AA00 B)</td>
<td>- 2-channel SIMBA Profinet module&lt;br&gt;  - Configuration and diagnostics software, executes with Windows 2000 and XP, engineering software, software class A, 2 languages (German, English), single license for 1 installation&lt;br&gt;  - Electronic documentation, 2 languages (German, English)&lt;br&gt; Type of delivery: Software and electronic documentation on CD, certificate of license, module</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>4-channel for 4 PROFIBUS lines with max. 125 PROFIBUS DP slaves each</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AE4 122-1AB00 B)</td>
<td>- 4-channel SIMBA Profinet module&lt;br&gt;  - Configuration and diagnostics software, executes with Windows 2000 and XP, engineering software, software class A, 2 languages (German, English), single license for 1 installation&lt;br&gt;  - Electronic documentation, 2 languages (German, English)&lt;br&gt; Type of delivery: Software and electronic documentation on CD, certificate of license, module</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>8-channel for 8 PROFIBUS lines with max. 125 PROFIBUS DP slaves each</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AE4 122-1AC00 B)</td>
<td>- 8-channel SIMBA Profinet module&lt;br&gt;  - Configuration and diagnostics software, executes with Windows 2000 and XP, engineering software, software class A, 2 languages (German, English), single license for 1 installation&lt;br&gt;  - Electronic documentation, 2 languages (German, English)&lt;br&gt; Type of delivery: Software and electronic documentation on CD, certificate of license, module</td>
</tr>
</tbody>
</table>

### 24 V DC plug-in power supply unit

Order for supplying SIMBA PROFIBUS module with 24 V DC if a corresponding power supply is not available<br>
- Input voltage 230 V AC, 50 Hz<br>  - Output voltage 24 V DC, 2.5 A<br>  - Connection on the primary side: non-heating appliance socket<br>  - Connection on the secondary side: DC connector matching the SIMBA Profibus module

### Services for every aspect of simulation

- Support and consulting<br>  - Selection of simulation tools<br>  - Strategy for implementing the simulation<br>  - Creation of simulation solutions at fixed price

### More information

Siemens AG<br>  Industry Sector<br>  Industry Solutions Division<br>  Industrial Technologies<br>  Karlsruhe

Phone: +49 721 595-6380<br>  Fax: +49 721 595-6383

E-mail: simba.solutions@siemens.com

Additional information is available on the Internet at: [www.siemens.com/Simba](http://www.siemens.com/Simba)
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.
## Selection and Ordering Data

<table>
<thead>
<tr>
<th>OPC client coupling V5.4</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software module for linking SIMIT to servers with OPC capability</td>
<td>9AP1 432-2AA10 (C)</td>
</tr>
<tr>
<td>Electronic documentation, 2 languages (German, English), is part of the SIMIT Basic product</td>
<td></td>
</tr>
<tr>
<td>Engineering software, software class A, 2 languages (German, English), single license for 1 installation</td>
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<tr>
<td>Type of delivery: Certificate of license, license key on diskette</td>
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</table>

<table>
<thead>
<tr>
<th>PLC SIM coupling V5.4</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software module for linking SIMIT to S7-PLCSIM</td>
<td>9AP1 433-2AA10</td>
</tr>
<tr>
<td>Can only be used in conjunction with S7-PLCSIM Version 5.2 or higher.</td>
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</tr>
<tr>
<td>Electronic documentation, 2 languages (German, English), is part of the SIMIT Basic product</td>
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<td>Engineering software, software class A, 2 languages (German, English), single license for 1 installation</td>
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<td>Type of delivery: Certificate of license, license key on diskette</td>
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</table>

<table>
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<tr>
<th>PROFIBUS DP coupling V5.4</th>
<th>Order No.</th>
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</thead>
<tbody>
<tr>
<td>Software module for linking SIMIT to the PROFIBUS DP of SIMATIC S7 PLCs</td>
<td>9AP1 434-2AA10 (E)</td>
</tr>
<tr>
<td>Can only be used for and in conjunction with SIMIT interface modules 9AP2 423-2AA10 and 9AP2 424-2AA10</td>
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<tr>
<td>Electronic documentation, 2 languages (German, English), is part of the SIMIT Basic product</td>
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<td>Engineering software, software class A, 2 languages (German, English), single license for 1 installation</td>
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<tr>
<td>Type of delivery: Certificate of license, license key on diskette</td>
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</tbody>
</table>

C) Subject to export regulations: AL: N, ECCN: EAR99S

E) Subject to export regulations: AL: N, ECCN: 5D992
**Selection and Ordering Data**

### TME V5.4
Trend & Message Editor, SIMIT expansion module for graphic display of signal trends and messages
- 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
- Order No.: 9AP1 443-2AA10

### SMD V5.4
Structured Model Diagrams, SIMIT expansion module for generation of models from templates and tables (PCS 7 Import/Export Assistant)
- 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
- Order No.: 9AP1 444-2AA10

### FlowNet V5.4
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
- Order No.: 9AP1 450-2AA10

### Documentation
Complete SIMIT documentation in electronic form (PDF files) on CD is part of the SIMIT Basic product.

**More Information**

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Erlangen

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You can find additional information in the Internet at:
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**E) Subject to export regulations: AL: N, ECCN: 5D992**
## Diagnostics

<table>
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<th>Page</th>
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<td>BANY: Bus analysis for SIMATIC Ethernet and PROFIBUS networks</td>
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<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.).
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

**Order No.**

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>BANYnet Ethernet: Bus analysis and diagnostics for SIMATIC Ethernet networks</td>
<td>9AE4 100-1DA00</td>
</tr>
<tr>
<td>Program package for PC/PG, 2 languages (German, English), executes with Microsoft Windows NT/2000/XP</td>
<td>9AE4 100-1DB00</td>
</tr>
<tr>
<td>Engineering and runtime software, software class A</td>
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</tr>
<tr>
<td>Type of delivery: Software and electronic documentation on CD as well as license key dongle</td>
<td></td>
</tr>
<tr>
<td>■ Software protection by means of parallel/serial dongle</td>
<td></td>
</tr>
<tr>
<td>■ Software protection by means of USB dongle</td>
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</tr>
</tbody>
</table>

**BANY PROFIBUS: Bus analysis and diagnostics for 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

<table>
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<tbody>
<tr>
<td>9AE4 100-1DE00</td>
<td>C)</td>
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</table>

**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

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>9AE4 100-1DF00</td>
<td>C)</td>
</tr>
</tbody>
</table>

**Network planning, plant analysis/diagnostics on site and BANY training**

<table>
<thead>
<tr>
<th>Order No.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>auf Anfrage</td>
<td></td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Order No.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9AE4 100-1DA00</td>
<td>C)</td>
</tr>
</tbody>
</table>

C) Subject to export regulations: AL: N, ECCN: EAR99S

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**More information**

Siemens AG
Industry Sector
Industry Solutions Division
Industrial Technologies
Karlsruhe

Phone: +49 721 595-6380
Fax: +49 721 595-6383
E-mail: bany.solutions@siemens.com
The bus monitor Amprolyzer V3.2 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.

---

### Overview

**PCS 7 Add-on**

**fit for SIMATIC PCS 7 V7**

---

### Function

**Essential functions of Amprolyzer V3.2**

- Message frame recording with trigger and filter options relating to events and message frame contents, including timestamp
- 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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Fax: +49 911 750-2100
E-mail: ComDeC@fthw.siemens.de

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. 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. Via the SIMATIC PCS 7 Maintenance Station, SIMATIC PCS 7 V6.1 and higher also offers uniform maintenance information and functions for the system components of the plant (assets). In addition to intelligent field devices, I/O modules, fieldbuses and controllers, this includes network components and plant bus as well as server and clients of the operator systems. See Catalog ST PCS 7 for details.
Diagnostics

System diagnostics via PROFIBUS

**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>Order No.</th>
<th>System diagnostics for PROFIBUS DP/PA slaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>2XV9 450-1SD12</td>
<td>Software and electronic documentation, 2 languages (German, English); additional languages can be configured by the user</td>
</tr>
<tr>
<td></td>
<td>Engineering and runtime software, software class A, single license for 1 installation</td>
</tr>
<tr>
<td></td>
<td>Type of delivery: Software on CD and license on diskette</td>
</tr>
<tr>
<td></td>
<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>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>System diagnostics for S7-400 CPUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2XV9 450-1SD08</td>
<td>Software and electronic documentation, 2 languages (German, English); additional languages can be configured by the user</td>
</tr>
<tr>
<td></td>
<td>Engineering and runtime software, software class A, single license for 1 installation</td>
</tr>
<tr>
<td></td>
<td>Type of delivery: Software on CD and license on diskette</td>
</tr>
<tr>
<td></td>
<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>
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</table>

C) Subject to export regulations: AL: N, ECCN: EAR99S

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## More information

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Industry Sector
Industry Solutions Division
Industrial Technologies
Erlangen
Phone: +49 9131 7-46111
Fax: +49 9131 7-44757
E-mail: it4industry@siemens.com

Additional information is available on the Internet at:
[www.siemens.com/systemdiagnostics_profinbus-slaves](http://www.siemens.com/systemdiagnostics_profinbus-slaves)
**Overview**

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-Analyser via MPI, CP/PG 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**

**ibaPDA-V6**

- Simple user interface with online signal visualization
- Language versions with automatic adaptation to the operating system installation
- Bar chart, digital and plot representation
- Various viewer functions, e.g. chart recorder substitute, instruments, top view, etc.
- Input of basic measurement clock from 50 μs (standard: 1 ms)
- Client/server architecture, .net compatibility
- Separation between configuration and measurement
- Central configuration dialog with integral online diagnostics
- Flexible module structure
- More than 2048 signals possible
- Several recordings in parallel (expandable)
- More Techno-Strings
- OPC variables (OPC server and OPC client functionalities)
- Virtual signals (formula editor)
- Signal groups
- Complex trigger frequencies
- Digital output signals (alarm messages)
- Timer control via DCF-77
- Look & feel similar to ibaAnalyzer

**ibaAnalyzer**

- Graphic user interface with intuitive operation
- Automatic scaling
- Report generator for automatic generation of graphic and tabular reports
- OLE technology
- Powerful mathematical formulae and operations
- Views: Y/T, X/Y, FFT, Y/length, 2D plan, 3D false colors and 3D grid
- Mathematically generated "virtual signals"
- Graphical digital filter editor
- Data export in ASCII format
- Automatic presentation of measurement files (slide show)
- Generation of analysis guidelines for use on several measurement files
- Combination of signals on a shared scale or on different scales
- Simultaneous consideration of analog and digital signals
- X/Y zoom, infinitely variable
- Special functions for length representations

**ibaAnalyzerDB**

- Data extraction of time-based and/or length-based measurement segments via ODBC in a database (e.g. Microsoft SQL Server, Microsoft Access, Oracle)
- Database query wizard (Query Builder)
- Database analysis with full scope of ibaAnalyzer instructions
Diagnostics

ibaPDA/ibaAnalyzer:
Fault tracking log - recording and analysis

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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Germany
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Fax: +49 911-97282-33
E-mail: sales@iba-ag.com

Additional information is available in the Internet under: 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.

Example configuration of PM-MAINT in a client/server architecture

PM-MAINT is scalable, and grows with your requirements. It can be used as a local single-user system or also as a distributed multi-user system in a client/server architecture. PM-MAINT can be installed in addition to the SIMATIC PCS 7 OS software on an operator station of version Single Station, Server or Client.

The PM-MAINT system software is structured as follows:
- Type S for Single Station (single-user system) or Server (multi-user system)
  - "Compact" version for up to 100 maintenance jobs
  - "Standard" version for up to 300 maintenance jobs
  - "Professional" version for more than 300 maintenance jobs
- Type C for Client (multi-user system)

PM-MAINT: Flexible maintenance management for SIMATIC PCS 7

**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>Order No.</th>
<th>PM-MAINT system software for SIMATIC PCS 7 V6 and V7</th>
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<tr>
<td>9AE7 104-2SS10-1AA0</td>
<td><strong>PM-MAINT system software</strong> Type S 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</td>
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<tr>
<td>9AE7 104-2SS20-1AA0</td>
<td><strong>&quot;Compact&quot; version</strong> for up to 100 maintenance jobs</td>
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<tr>
<td>9AE7 104-2SS30-1AA0</td>
<td><strong>&quot;Standard&quot; version</strong> for up to 300 maintenance jobs</td>
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<tr>
<td>9AE7 104-5CS00-1AA0</td>
<td><strong>&quot;Professional&quot; version</strong> for more than 300 maintenance jobs</td>
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<tr>
<th>Order No.</th>
<th>PM-MAINT system software Type C 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</th>
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<tr>
<td>9AE7 104-5SC00-1AA0</td>
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**More information**

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Industry Solutions Division
WinCC Competence Center Mannheim
Phone: +49 621 456 3269
Fax: +49 621 456 3334
E-mail: WinCCAddon.automation@siemens.com

Additional information is available on the Internet at:
www.siemens.de/process-management
Laboratory automation

SIMATIC PCS 7 LAB: Compact control system for the laboratory automation

Overview

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. The simple and universal SIMATIC PCS 7 LAB is explicitly tailored to these specific requirements. Ready-to-use solution proposals for typical laboratory applications, e.g. for dosing, temperature control or inertization processes, significantly assist the laboratory personnel in their work with the integrated control technology.

SIMATIC PCS 7 LAB not only allows autonomous automation of the laboratory. Integration in a SIMATIC PCS 7 plant network permits both efficient exchange of information and simple transfer of laboratory results to the production department.

Design

The basic components for configuration of a SIMATIC PCS 7 LAB are five rugged modules which can be integrated into any laboratory as a result of their compact design:

- PC module
- ET 200M I/O module
- ET 200pro I/O module
- POWER module for ET 200pro
- SER module

It is then possible to implement an extremely flexible centralized or distributed design in various environments. Mobile use at changing locations is also possible.

The following module combinations are offered as standard configurations:

- SIMATIC PCS 7 LAB ET 200M, consisting of PC module and ET 200M I/O module
- SIMATIC PCS 7 LAB ET 200pro, consisting of PC module, ET 200pro I/O module and POWER module

These can also be expanded by the optional SER module.

Further configurations and solutions are also possible. If your requirements cannot be solved using the standard configurations offered, please contact the address specified in the section "Further information" to obtain an alternative offer.

PC module

The PC module provides the functionalities for automation, engineering and HMI. It is technically comparable with the integral SIMATIC PCS 7 BOX 416 (see Catalog ST PCS 7, section "Compact systems and basic packages, SIMATIC PCS 7 BOX 416"). On the front there are:

- 2 Industrial Ethernet connections
- 2 PROFIBUS DP connections
- 4 USB interfaces (2 x high current, 2 x for mouse and keyboard)
- 1 serial COM1 interface

A DVI-I interface at the rear permits the connection of a suitable monitor (not included in the scope of supply). A monitor with VGA interface can also be connected via an adapter.

Also at the rear are 2 ECOFAST interfaces for the PROFIBUS DP connection of the I/O modules and the SER module.

The SIMATIC PCS 7 engineering software AS/OS, including 250 PO AS/OS runtime license for productive operation, is pre-installed on the PC module. Its functions can be expanded by optional software from the SIMATIC PCS 7 product range, e.g. by SIMATIC BATCH or SIMATIC Route Control.
I/O modules

Depending on the environment of use and the technical conditions, you can choose between two preconfigured I/O modules with selected modules from the ET 200M or ET 200pro distributed I/O systems.

ET 200M I/O module

The ET 200M I/O module contains the following components:
- 100 ... 240 V AC/24 V DC power supply (10 A)
- IM 153-2 High Feature PROFIBUS DP interface
- CP341 serial interface module (2 x RS 232C)
- 6 ET 200M I/O modules from the following range:
  - SM 331 analog input module for current measurements: AI I 8 x 0/4 ... 20 mA
  - SM 331 analog input module for voltage measurements: AI U 8 x ±10 V
  - SM 331 analog input module for temperature measurements: AI RTD 4 x Pt100
  - SM 321 digital input module: DI 16 x 24 V DC
  - SM 322 digital output module: DO 16 x 24 V DC/0.5 A

The I/O modules are wired on the front panels using color-coded safety laboratory sockets (4 mm) for DI, DO, AI, AO and functional ground. These plug connections allow fast and flexible connection to sensors and actuators, and are extremely advantageous when frequent modification or conversion is necessary. The two serial interfaces of the CP 334 are connected to two 9-pole sub-D connectors.

ET 200pro I/O module

The ET 200pro I/O module with high IP65/IP66/IP67 degree of protection can be installed directly in the laboratory equipment. The following components are mounted side by side on the module carrier:
- IM 154-2 High Feature PROFIBUS DP interface
- 7 ET 200M I/O modules from the following range:
  - EM 144 analog input module for current measurements: AI I 4 x ±20 mA
  - EM 144 analog input module for voltage measurements: AI U 4 x ±10 V
  - EM 144 analog input module for temperature measurements: AI RTD 4 x Pt100
  - EM 141 digital input module: DI 8 x 24 V DC
  - 2 x EM 142 digital output module: DO 4 x 24 V DC/2 A

The actuators and sensors are connected to the terminal modules of the electronic modules by means of 5-pin M12 connectors.

POWER module for ET 200pro

The POWER module is used for the external 24 V DC supply of the ET 200pro I/O module. The 24 V DC infeed is via the ECO-FAST hybrid cable of the PROFIBUS DP. The PROFIBUS DP is looped through on the POWER module.
SER module

The SER module is equipped with four CP 341 and provides a total of 8 serial RS 232C interfaces for connecting external devices. These interfaces are connected to 9-pole sub-D connectors arranged in pairs on the front of the module.

Function

An example project including hardware and bus configurations is installed on the SIMATIC PCS 7 LAB. This can be used for acquaintance purposes and to test the inputs and outputs. The hardware and bus configurations can be used as the basis for own applications.

Software equipment modules are additionally available free of charge for the following laboratory-specific applications:
- Agitation (stirring)
- Pressure (aerating and venting)
- Discharge (delivery/transfer)
- Dosing by means of a modulating valve
- Analysis
- Temperature (temperature adjustment)
- Dosing of solids
- Dosing with open/closed valve

Please contact:
Siemens AG
IIA AS PA PM3
Siemensallee 84
76187 Karlsruhe
Germany

Technical specifications

<table>
<thead>
<tr>
<th>SIMATIC PCS 7 LAB module</th>
<th>Dimensions (W x H x D) in mm</th>
<th>Weight in kg</th>
<th>Degree of protection</th>
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</thead>
<tbody>
<tr>
<td>PC module</td>
<td>585 x 300 x 332</td>
<td>21</td>
<td>IP20</td>
</tr>
<tr>
<td>ET 200M I/O module</td>
<td>585 x 300 x 332</td>
<td>19</td>
<td>IP20</td>
</tr>
<tr>
<td>ET 200pro I/O module</td>
<td>500 x 180 x 85</td>
<td>5,5</td>
<td>IP65/IP66/IP67</td>
</tr>
<tr>
<td>POWER module for ET 200pro</td>
<td>370 x 300 x 316</td>
<td>12</td>
<td>IP20</td>
</tr>
<tr>
<td>SER module</td>
<td>585 x 300 x 332</td>
<td>19</td>
<td>IP20</td>
</tr>
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</table>

Selection and Ordering Data

Order No. SIMATIC PCS 7 LAB ET 200M Compact process control system for laboratory automation, without monitor; operating system and SIMATIC PCS 7 software preinstalled

Type of delivery:
- 1 x PC module
- 1 x ET 200M I/O module
- 1 x mouse (USB)
- 1 x keyboard (USB)
- 2 x power cable “Europe”
- 1 x backup battery for WinAC Slot 416
- 2 x ECOFAST cable, 10 m
- 2 x ECOFAST bus termination connector
- 1 x restore DVD and license for Microsoft Windows XP Professional
- 1 x SIMATIC PCS 7 engineering software for AS/OS, including 250 PO AS/OS runtime license for productive operation, floating license for 1 user
- 1 x license for SIMATIC PCS 7 SFC Visualization, floating license for 1 user
- 1 x CD with software and documentation for WinAC Slot 412/416
- 1 x CD for CP 341
- 1 x documentation for SIMATIC PCS 7 LAB and SIMATIC Box PC 627B

Order No. 6DL3 902-1BA00

E) Subject to export regulations: AL: N, ECCN: 5D992
Labary automation

SIMATIC PCS 7 LAB: Compact control system for the laboratory automation

Notes:
SIMATIC PCS 7 LAB is based on the software of the current SIMATIC PCS 7 V7 process control system. SIMATIC PCS 7 LAB can be extended by supplementary and expansion components for the SIMATIC PCS 7 BOX 416 (see Catalog ST PCS 7, Section "Compact systems and basic packages").

More information
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Industry Sector
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E-mail: addon_s2.aud@siemens.com

You can find additional information in the Internet at:
www.siemens.com/simatic-pcs7-lab

<table>
<thead>
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<td>SIMATIC PCS 7 LAB ET 200pro</td>
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<tr>
<td>Compact process control system for laboratory automation, without monitor; operating system and SIMATIC PCS 7 software preinstalled</td>
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</tr>
<tr>
<td>Type of delivery:</td>
<td></td>
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<tr>
<td>• 1 x PC module</td>
<td></td>
</tr>
<tr>
<td>• 1 x ET 200pro I/O module</td>
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</tr>
<tr>
<td>• 1 x POWER module</td>
<td></td>
</tr>
<tr>
<td>• 1 x mouse (USB)</td>
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<tr>
<td>• 1 x keyboard (USB)</td>
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<tr>
<td>• 1 x backup battery for WinAC Slot 416</td>
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<tr>
<td>• 1 x ECOFAST cable, 10 m</td>
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<tr>
<td>• 1 x ECOFAST cable, 5 m</td>
<td></td>
</tr>
<tr>
<td>• 2 x ECOFAST bus termination connector</td>
<td></td>
</tr>
<tr>
<td>• 2 x power cable “Europe”</td>
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<tr>
<td>• 1 x restore DVD and license for Microsoft Windows XP Professional</td>
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<tr>
<td>• 1 x SIMATIC PCS 7 engineering software for AS/OS, including 250 PO AS/OS runtime license for productive operation, floating license for 1 user</td>
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<tr>
<td>• 1 x license for SIMATIC PCS 7 SFC Visualization, floating license for 1 user</td>
<td></td>
</tr>
<tr>
<td>• 1 x CD with software and documentation for WinAC Slot 412/416</td>
<td></td>
</tr>
<tr>
<td>• 1 x documentation for SIMATIC PCS 7 LAB and SIMATIC Box PC 627B</td>
<td></td>
</tr>
</tbody>
</table>

Option
SER module for SIMATIC PCS 7 LAB
Module with eight RS 232C serial interfaces for connection of external devices
| Type of delivery: |
| • 1 x SER module |
| • 1 x power cable “Europe” |
| • 1 x ECOFAST cable, 10 m |
| • 1 x ECOFAST bus termination connector |
| • 1 x CD for CP 341 |

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
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<tr>
<td>Accessories</td>
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<tr>
<td>Power cable, 3 m</td>
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</tr>
<tr>
<td>• For Great Britain</td>
<td></td>
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<tr>
<td>6ES7 900-0BA00-0XA0</td>
<td></td>
</tr>
<tr>
<td>• For Switzerland</td>
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<tr>
<td>6ES7 900-0CA00-0XA0</td>
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<tr>
<td>• For the USA</td>
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<td>6ES7 900-0DA00-0XA0</td>
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<tr>
<td>• For Italy</td>
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</tr>
<tr>
<td>6ES7 900-0EA00-0XA0</td>
<td></td>
</tr>
<tr>
<td>• For China</td>
<td></td>
</tr>
<tr>
<td>6ES7 900-0FA00-0XA0</td>
<td></td>
</tr>
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</table>

B) Subject to export regulations: AL: N, ECCN: EAR99H
E) Subject to export regulations: AL: N, ECCN: 5D992

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### Power management

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/2</td>
<td>SIMATIC PCS 7 powerrate: Power data evaluation and energy management</td>
</tr>
<tr>
<td>11/4</td>
<td>SENTRON 3WL/3VL block library for SIMATIC PCS 7</td>
</tr>
<tr>
<td>11/5</td>
<td>SENTRON PAC3200 block library for SIMATIC PCS 7</td>
</tr>
</tbody>
</table>
SIMATIC PCS 7 powerrate provides transparency for energy consumption – from the infeed up to the consumer. Energy data are continuously recorded, archived and processed further by SIMATIC PCS 7 powerrate. Exact knowledge of the consumption profile allows efficient energy importing as well as identification of saving potentials, and thus helps you to effectively reduce your energy costs. Through monitoring of the supply limit agreed in a contract you are able to fully utilize your limit without unnecessarily high supply prices or penalties becoming due.

SIMATIC PCS 7 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 PCS 7 powerrate without problem.

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

Design
SIMATIC PCS 7 powerrate consists of the following components:
- Blocks for recording and conditioning energy data
- Faceplates for displaying and processing energy data
- Excel macro for assignment of energy data to cost centers
- Blocks for implementing load management (trend calculation, limit monitoring, connection/disconnection of consumers)
- Faceplates for displaying results and configuration of load management
- Excel macro for determining the load duration curve as the decision basis for load management

Function

Recording and conditioning energy data
Using predefined blocks, you are able to record the energy data of any devices with PROFIBUS capability. The data can be present on the blocks in the form of counted pulses, counted values or supply values. The blocks calculate the average supply values from this data, as well as the work values for a defined period. You can also enter counted values manually.

The data is stored in the PCS 7 tag logging archive. In addition, a predicted end value is calculated for each period. Following storage in the PCS 7 tag logging archive, SIMATIC PCS 7 can access this data.

To simulate customized calculations, an example function (heat calculation) is available which can be adapted to customer requirements at any time over open interfaces.

Manually recorded counter data can be entered directly into the system and then used for further evaluations.

Displaying energy data

The currently recorded energy data is displayed as average supply values or work values for an interval. A load curve permits evaluation of archived energy data and its presentation in tables.

Further processing of data

You can also directly export the archived data from the SIMATIC PCS 7 operator system to Microsoft Excel. Exported energy data can be processed further in line with customer requirements.

Predefined macros provide you with support for generating typical reports:
- Cost center report
  Assignment of consumption to various cost centers as well as cost calculations based on defined tariffs. The results can be output in reports as tables or bar graphs.
- Load duration curve
  How frequently a certain mean supply value occurs within a defined period is evaluated on the basis of the archived average supply values. This characteristic can be used to rapidly detect short-term supply peaks.
**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.

**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 may become necessary. Using cyclic trend calculations, the load management function of SIMATIC PCS 7 powerrate permits early recognition of limit violations, and signals these by means of warnings/alarm. Depending on the configuration, loads are also switched off directly in the event of an imminent limit violation. To avoid unnecessary switching operations, the load management function can be simply and conveniently adapted to the current process conditions by a wide range of parameters directly on the keypad.

Loads distributed among different automation systems are linked into the load management by SIMATIC PCS 7 powerrate through AS-AS communication blocks.

**Note:**

The following block libraries are supplied free of charge with the products "SIMATIC PCS 7 powerrate V3.0" and "SIMATIC PCS 7 powerrate Upgrade V2.0 to V3.0":

- SENTRON 3VL/3WL (Order No. 3ZS2782-1CC10-0YG0)
- SENTRON PKC3200 (Order No. 3ZS2781-1CC10-0YG0)

Further information on these block libraries is available in Chapter "Energy Management" of this catalog in separate articles.
Power management

SENTRON 3WL/3VL block library for SIMATIC PCS 7

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

Order No.

SENTRON 3WL/3VL block library for SIMATIC PCS 7 V6.1 (SP1 and higher), V7.0 and V7.1

SENTRON 3WL/3VL V1.0 block library for SIMATIC PCS 7

AS blocks and faceplates for integration of SENTRON circuit-breakers 3WL/3VL in SIMATIC PCS 7 V6.1 (SP1 and higher), V7.0 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

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)

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

More information

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Industrial Automation Systems
Technical Assistance
Nuremberg
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E-mail: technical-assistance@siemens.com

Additional information is available on the Internet at: www.siemens.com/sentron
Overview

The SENTRON PAC3200 block library permits seamless integration of the SENTRON PAC3200 multi-function measuring device operated on the PROFIBUS DP 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 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 multi-function measuring device in the operator station of the process control system. They permit display and operation of technologically-relevant values and functions using SIMATIC PCS 7 objects.

Bidirectional communication links between the faceplates and the blocks as well as between the blocks and the SENTRON PAC3200 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 (SP1 and higher in each case) and V7.1. It supports all operating systems of these system versions.

Function

- Total integration of the SENTRON PAC3200 into the SIMATIC PCS 7 process control system via PROFIBUS DPV1 with certified SIMATIC PCS 7 add-on block library SENTRON 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

Order No.

SENTRON PAC3200 block library for SIMATIC PCS 7 V6.1, V7.0 (SP1 and higher in each case) and V7.1

SENTRON 3PAC3200 V1.0 block library for SIMATIC PCS 7

AS blocks and faceplates for integration of the SENTRON PAC3200 multi-function measuring device in SIMATIC PCS 7 V6.1, V7.0 (SP1 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

AS runtime license for SENTRON PAC3200 block library V1.0 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

E) Subject to export regulations: AL: N, ECCN: 5D992

More information

Siemens AG
Industry Sector
Industry Automation Division
Industrial Automation Systems
Nuremberg

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E-mail: support.automation@siemens.com

Additional information is available on the Internet at:
www.siemens.de/powermanagementsystem
Power management
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.

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.
## Cabinet construction

### Cabinets for SIMATIC PCS 7

#### Selection and Ordering Data

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<thead>
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<th>Cabinet design</th>
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<td>6DL2 800-</td>
</tr>
<tr>
<td>Cabinet design</td>
<td></td>
</tr>
<tr>
<td><strong>Cabinet with 19” mounting frame, crane lifting lugs, twist lever handle, pocket for circuit diagram</strong></td>
<td></td>
</tr>
<tr>
<td>Dimensions HxWxD in mm, degree of protection:</td>
<td></td>
</tr>
<tr>
<td>• Cabinet with single-wing door 2000 x 800 x 400, IP40</td>
<td>1 A</td>
</tr>
<tr>
<td>• Cabinet with single-wing door 2000 x 800 x 400, IP20</td>
<td>1 B</td>
</tr>
<tr>
<td>• Cabinet with single-wing door 2000 x 800 x 600, IP40</td>
<td>2 A</td>
</tr>
<tr>
<td>• Cabinet with single-wing door 2000 x 800 x 600, IP20</td>
<td>2 B</td>
</tr>
<tr>
<td>• Cabinet with double-wing door 2000 x 1000 x 400, IP40</td>
<td>3 E</td>
</tr>
<tr>
<td>• Cabinet with double-wing doors on front and back 2000 x 1000 x 600, IP40</td>
<td>4 G</td>
</tr>
<tr>
<td>• Cabinet with single-wing door 2200 x 800 x 400, IP20</td>
<td>2 A</td>
</tr>
<tr>
<td>• Cabinet with single-wing doors on front and back 2200 x 800 x 600, IP20</td>
<td>6 K</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Base</th>
<th>Dimensions WxD in mm:</th>
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<tbody>
<tr>
<td>• Without base</td>
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<tr>
<td>• Base 800 x 400</td>
<td>A</td>
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<tr>
<td>• Base 800 x 600</td>
<td>B</td>
</tr>
<tr>
<td>• Base 1000 x 400</td>
<td>C</td>
</tr>
<tr>
<td>• Base 1000 x 600</td>
<td>D</td>
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<table>
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<th>Dimensions HxD in mm:</th>
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<tr>
<td>- 2000 x 400</td>
<td>1</td>
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<tr>
<td>- 2000 x 600</td>
<td>3</td>
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<td>- 2200 x 400</td>
<td>5</td>
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<tr>
<td>- 2200 x 600</td>
<td>7</td>
</tr>
<tr>
<td>• Side panel on left and right</td>
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<td>- 2000 x 400</td>
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<tr>
<td>- 2000 x 600</td>
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<td>- 2200 x 400</td>
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#### Infeed

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<td>6DL2 800-</td>
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<tr>
<td>• No infeed</td>
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<tr>
<td>• 24 V DC with</td>
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</tr>
<tr>
<td>- 4 x Siemens circuit-breakers</td>
<td>1 A</td>
</tr>
<tr>
<td>- 8 x Siemens circuit-breakers</td>
<td>1 B</td>
</tr>
<tr>
<td>- 12 x Siemens circuit-breakers</td>
<td>1 C</td>
</tr>
<tr>
<td>- 6 x ICE circuit-breakers with aux. contact</td>
<td>1 E</td>
</tr>
<tr>
<td>- 12 x ICE circuit-breakers with aux. contact</td>
<td>1 H</td>
</tr>
<tr>
<td>• 24 V DC redundant with</td>
<td></td>
</tr>
<tr>
<td>- 4 x Siemens circuit-breakers</td>
<td>2 A</td>
</tr>
<tr>
<td>- 8 x Siemens circuit-breakers</td>
<td>2 B</td>
</tr>
<tr>
<td>- 12 x Siemens circuit-breakers</td>
<td>2 C</td>
</tr>
<tr>
<td>- 6 x ICE circuit-breakers with aux. contact</td>
<td>2 E</td>
</tr>
<tr>
<td>- 12 x ICE circuit-breakers with aux. contact</td>
<td>2 H</td>
</tr>
<tr>
<td>• 120/230 V AC with</td>
<td></td>
</tr>
<tr>
<td>- 4 x Siemens circuit-breakers</td>
<td>3 A</td>
</tr>
<tr>
<td>- 8 x Siemens circuit-breakers</td>
<td>3 B</td>
</tr>
<tr>
<td>- 12 x Siemens circuit-breakers</td>
<td>3 C</td>
</tr>
<tr>
<td>- 6 x ICE circuit-breakers with aux. contact</td>
<td>3 E</td>
</tr>
<tr>
<td>- 12 x ICE circuit-breakers with aux. contact</td>
<td>3 H</td>
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#### Installation of system unit

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</tr>
<tr>
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<td>X</td>
</tr>
<tr>
<td>• 1x bundle with UR2 or UR1</td>
<td>A</td>
</tr>
<tr>
<td>• 2x bundles with UR2 or UR1</td>
<td>B</td>
</tr>
<tr>
<td>• 3x bundles with UR2 or UR1</td>
<td>C</td>
</tr>
<tr>
<td>• 4x bundles with UR2 or UR1</td>
<td>D</td>
</tr>
<tr>
<td>• 1x bundle with UR2 or UR1, with OLM or OSM</td>
<td>E</td>
</tr>
<tr>
<td>• 2x bundles with UR2 or UR1, with OLM or OSM</td>
<td>F</td>
</tr>
<tr>
<td>• 3x bundles with UR2 or UR1, with OLM or OSM</td>
<td>G</td>
</tr>
<tr>
<td>• 4x bundles with UR2 or UR1, with OLM or OSM</td>
<td>H</td>
</tr>
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</table>

#### Documentation

<table>
<thead>
<tr>
<th>Documentation</th>
<th>Order No.</th>
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<tbody>
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<td>6DL2 800-</td>
</tr>
<tr>
<td>• Without documentation</td>
<td>0</td>
</tr>
<tr>
<td>• General description of cabinet</td>
<td></td>
</tr>
<tr>
<td>- German</td>
<td>1</td>
</tr>
<tr>
<td>- English</td>
<td>2</td>
</tr>
<tr>
<td>• Cabinet-specific documentation with AutoCAD drawings</td>
<td></td>
</tr>
<tr>
<td>- German</td>
<td>3</td>
</tr>
<tr>
<td>- English</td>
<td>4</td>
</tr>
<tr>
<td>• General description and cabinet-specific documentation with AutoCAD drawings</td>
<td></td>
</tr>
<tr>
<td>- German</td>
<td>5</td>
</tr>
<tr>
<td>- English</td>
<td>6</td>
</tr>
</tbody>
</table>
### Selection and Ordering Data

<table>
<thead>
<tr>
<th>ET 200M I/O station</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFINET</td>
<td>6DL2 801-</td>
</tr>
<tr>
<td>PROFINET DP in copper, for IM 153-1</td>
<td>1</td>
</tr>
<tr>
<td>PROFINET DP in copper, for redundant IM 153-2</td>
<td>2</td>
</tr>
<tr>
<td>PROFINET DP in fiber-optic, for IM 153-1</td>
<td>3</td>
</tr>
<tr>
<td>PROFINET DP in fiber-optic, for redundant IM 153-2</td>
<td>4</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 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 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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**Cabinets for SIMATIC PCS 7**

### Selection and Ordering Data

**ET 200M I/O station**

<table>
<thead>
<tr>
<th>Installation of the I/O modules</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Without installation of the I/O modules</td>
<td>6DL2 802-</td>
</tr>
<tr>
<td>• Without installation of the I/O modules, prepared with isolating element and partition in cable duct for Ex(i) design</td>
<td>0</td>
</tr>
<tr>
<td>• Installation of 4 I/O modules, connect L+ and M supply, test and parameterize modules</td>
<td>1</td>
</tr>
<tr>
<td>• Installation of 8 I/O modules, connect L+ and M supply, test and parameterize modules</td>
<td>2</td>
</tr>
<tr>
<td>• Installation of 4 I/O modules for Ex(i), connect L+ and M supply, test and parameterize modules, cable guide for L+ I/O module supply, isolating element between non-hazardous and hazardous areas, partition in cable duct, cable duct marked in blue</td>
<td>3</td>
</tr>
<tr>
<td>• Installation of 8 I/O modules for Ex(i), connect L+ and M supply, test and parameterize modules, cable guide for L+ I/O module supply, isolating element between non-hazardous and hazardous areas, partition in cable duct, cable duct marked in blue</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tests</th>
<th></th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DP/PA coupler</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Installation, wiring and bus connection of up to 4 DP/PA couplers on 19” DIN rails without individual protection of the I/O modules</td>
<td>6DL2 803-1AA00</td>
</tr>
<tr>
<td>• Installation, wiring and bus connection of up to 4 DP/PA couplers on 19” DIN rails with individual protection of the I/O modules</td>
<td>6DL2 803-1AA10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DP/PA link</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation, wiring and bus connection of IM 157 and up to 4 DP/PA links/couplers on 19” DIN rails without individual protection of the I/O modules</td>
<td>6DL2 803-1BA00</td>
</tr>
<tr>
<td>Installation, wiring and bus connection of IM 157 and up to 4 DP/PA links/couplers on 19” DIN rails with individual protection of the I/O modules</td>
<td>6DL2 803-1BA10</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

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Time synchronization
Time synchronization

SICLOCK time synchronization

Overview

- SICLOCK TC 400/TC 100 or SICLOCK TS 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
  - Significantly extended redundancy functions
  - 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/TC 100 and SICLOCK TS 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 or SICLOCK TS 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 DCF57 is a low-cost alternative to DCF77 synchronization directly over an S7 digital input.

Design

SICLOCK TC 400/TC 100 and SICLOCK TS 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/TC 100 and SICLOCK TS central plant clocks support the synchronization of CPs 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 and PTP.

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 brother” 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 (Industrial) Ethernet.

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.
**SICLOCK TS**

SICLOCK TS 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 individually parameterizable outputs for point-to-point connections and IRIG A and B.

If the antenna of a radio clock fails, all SICLOCK central plant clocks continue to provide reliable timekeeping 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**

**SICLOCK TC 400 central plant clock**

<table>
<thead>
<tr>
<th>SICLOCK TC 400 preferred package</th>
<th>2XV9 450-2AR10 A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package comprises</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TC 400</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK GPS1000 system with</td>
<td></td>
</tr>
<tr>
<td>antenna frame</td>
<td></td>
</tr>
<tr>
<td>• Lightning protection for GPS</td>
<td></td>
</tr>
<tr>
<td>Complete solution, e.g. for use</td>
<td></td>
</tr>
<tr>
<td>in PCS 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SICLOCK TC 400 DCF77</th>
<th>2XV9 450-2AR20</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK TC 400 central plant</td>
<td></td>
</tr>
<tr>
<td>clock with Ethernet interface</td>
<td></td>
</tr>
<tr>
<td>+ DCFRS radio clock, industrial</td>
<td></td>
</tr>
<tr>
<td>version, package comprises</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TC 400</td>
<td></td>
</tr>
<tr>
<td>• Active DCF77 antenna with TTY</td>
<td></td>
</tr>
<tr>
<td>output (20 mA line current) and</td>
<td></td>
</tr>
<tr>
<td>antenna frame</td>
<td></td>
</tr>
<tr>
<td>• Junction box</td>
<td></td>
</tr>
<tr>
<td>• 1 m connecting cable mounted,</td>
<td></td>
</tr>
<tr>
<td>extendable to 1000 m</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SICLOCK TC 400 single device</th>
<th>2XV9 450-2AR01</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK TC 100 single device</td>
<td>2XV9 450-2AR22</td>
</tr>
</tbody>
</table>

**SICLOCK TS central plant clock**

<table>
<thead>
<tr>
<th>SICLOCK TS GPS1000</th>
<th>2XV9 450-1AR54</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK TS central plant clock</td>
<td></td>
</tr>
<tr>
<td>with Ethernet interface and</td>
<td></td>
</tr>
<tr>
<td>IRIG A and B + GPS1000 radio</td>
<td></td>
</tr>
<tr>
<td>clock, package comprises</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TS in stainless steel</td>
<td></td>
</tr>
<tr>
<td>housing for rail mounting</td>
<td></td>
</tr>
<tr>
<td>• GPS1000 radio clock with</td>
<td></td>
</tr>
<tr>
<td>antenna frame</td>
<td></td>
</tr>
<tr>
<td>• Junction box</td>
<td></td>
</tr>
<tr>
<td>- with SICLOCK TS</td>
<td></td>
</tr>
<tr>
<td>24 ... 110 V DC</td>
<td>2XV9 450-1AR55</td>
</tr>
<tr>
<td>- with SICLOCK TS</td>
<td></td>
</tr>
<tr>
<td>90 ... 230 V AC/DC</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SICLOCK TS single device</th>
<th>2XV9 450-1AR52</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICLOCK TS central plant clock</td>
<td></td>
</tr>
<tr>
<td>with Ethernet interface and</td>
<td></td>
</tr>
<tr>
<td>IRIG A and B in stainless</td>
<td></td>
</tr>
<tr>
<td>steel housing for rail</td>
<td></td>
</tr>
<tr>
<td>mounting</td>
<td></td>
</tr>
<tr>
<td>• SICLOCK TS 24 ... 110 V DC</td>
<td>2XV9 450-1AR53</td>
</tr>
<tr>
<td>• SICLOCK TS 90 ... 230 V AC/DC</td>
<td></td>
</tr>
</tbody>
</table>

A) Subject to export regulations: AL: N, ECCN: 7A994A

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**DCF radio clocks**

**SICLOCK DCFRS, radio clock, industrial version**

2XV9 450-1AR21

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.

- Active DCF77 antenna with TTY output (20 mA line current) and antenna frame
- TTY/RS232 converter
- Plug-in power supply
- Two junction boxes
- 1 m connecting cable mounted, extendable to 1000 m
- DCF77 receiving service for Windows

**SICLOCK DCFEMP, receiver with TTY interface**

2XV9 450-1AR61

DCF receiver for connection to existing HF cable system in the plant for DCF77 time signals for time synchronization of individual PCs or servers at distances of up to 1000 m.

- Active DCF77 receiver with mounting bracket and TTY interface
- 1 m connecting cable mounted

**SICLOCK DCFS7**

2XV9 450-1AR36

Low-cost solution for time synchronization of SIMATIC S7-300/400 over DCF77 over one digital input.

- SICLOCK DCFRS, radio clock with RS232 interface
- Mounting bracket
- 20 m connecting cable mounted
- DCF77 receiving service for Windows

**Accessories for SICLOCK DCFS7**

**SICLOCK DCFS7 interface + receiving service**

2XV9 450-1AR30

(STEP 7 function block for integration in S7 software)

**SICLOCK DCFS7 receiving service**

2XV9 450-1AR32

(STEP 7 function block for integration in S7 software)
<table>
<thead>
<tr>
<th>GPS radio clocks</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SICLOCK WINGPS, radio clock for Windows</strong></td>
<td><strong>Set of materials for SICLOCK TM/TS</strong></td>
</tr>
<tr>
<td>GPS radio clock for the time synchronization of</td>
<td>• for desktop housing</td>
</tr>
<tr>
<td>individual PCs in industrial environments with high</td>
<td>• for 19&quot; mounting frame (4 HU)</td>
</tr>
<tr>
<td>levels of interference, package comprises</td>
<td></td>
</tr>
<tr>
<td>• GPS antenna with antenna frame</td>
<td></td>
</tr>
<tr>
<td>• WINGPS decoder with power supply</td>
<td></td>
</tr>
<tr>
<td>• 22 m coax antenna cable (max. length 70 m, see</td>
<td></td>
</tr>
<tr>
<td>accessories)</td>
<td></td>
</tr>
<tr>
<td>• 20 m PC connection cable WINGPS</td>
<td></td>
</tr>
<tr>
<td>• DCF77 receiving service for Windows</td>
<td></td>
</tr>
<tr>
<td><strong>SICLOCK GPSDEC, radio clock for Windows</strong></td>
<td><strong>Lightning protection for antenna cable</strong></td>
</tr>
<tr>
<td>GPS radio clock for the time synchronization of the</td>
<td>• Lighting protection for coaxial antenna cable</td>
</tr>
<tr>
<td>SICLOCK TS central plant clocks or programmable</td>
<td>(SICLOCK GPSDEC/WINGPS)</td>
</tr>
<tr>
<td>controllers in industrial environments with high</td>
<td>• Lighting protection for TTY connecting cable</td>
</tr>
<tr>
<td>levels of interference, package comprises</td>
<td>(SICLOCK GPS1000/DCFRS industrial version)</td>
</tr>
<tr>
<td>• GPS antenna with antenna frame</td>
<td>• Lighting protection for RS232 antenna cable</td>
</tr>
<tr>
<td>• GPSDEC decoder with power supply</td>
<td>(SICLOCK DCF57/DCFRS with RS232 interface)</td>
</tr>
<tr>
<td>• 22 m coax antenna cable (max. length 70 m, see</td>
<td></td>
</tr>
<tr>
<td>accessories)</td>
<td></td>
</tr>
<tr>
<td>• 5 m RS232 connecting cable</td>
<td></td>
</tr>
<tr>
<td>• Parameterization program</td>
<td></td>
</tr>
<tr>
<td><strong>GPS1000 + power supply, radio clock for Windows</strong></td>
<td><strong>Coaxial antenna cable</strong></td>
</tr>
<tr>
<td>GPS radio clock for time synchronization of PCs,</td>
<td><strong>SICLOCK GPSDEC/WINGPS</strong></td>
</tr>
<tr>
<td>programmable controllers as well as SICLOCK TC</td>
<td>• 30 m</td>
</tr>
<tr>
<td>TC 400/TC 100 and SICLOCK TS central plant clocks</td>
<td>2XV9 450-1AR12</td>
</tr>
<tr>
<td>in industrial environments with high levels of</td>
<td>• 70 m</td>
</tr>
<tr>
<td>interference, package comprises</td>
<td>2XV9 450-1AR07</td>
</tr>
<tr>
<td>• GPS1000 antenna head with antenna frame</td>
<td></td>
</tr>
<tr>
<td>• GPS1000 power supply</td>
<td></td>
</tr>
<tr>
<td>• Junction box</td>
<td></td>
</tr>
<tr>
<td>• 5 m RS232 connecting cable</td>
<td></td>
</tr>
<tr>
<td>• DCF77 receiving service for Windows</td>
<td></td>
</tr>
</tbody>
</table>

A) Subject to export regulations: AL: N, ECCN: 7A994A

**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 ... 110 V DC**
  - 2XV9 450-1AR72
- **SICLOCK EOPC 90 ... 230 V AC/DC**
  - 2XV9 450-1AR73

**SICLOCK PCON**

Single-channel electrical/optical pulse converter for industrial applications

- **SICLOCK PCON 24 ... 230 V AC/DC, with multi-mode fiber-glass connection, 820 nm**
  - 2XV9 450-1AR63-1SA3
- **SICLOCK PCON 24 ... 230 V AC/DC, long distance, with multi-mode fiber-glass connection, 1310 nm**
  - 2XV9 450-1AR63-1MA3

**SICLOCK DCFHF**

HF modulator for DCF77 signals for industrial applications

- 2XV9 450-1AR64

**More information**

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You can find more information in the Internet at:

www.siemens.com/siclock
Process Services

14/2 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"
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.

Design

All Premium Services have identical structures. They consist of three modules which build upon each other, can be ordered individually, and provide clearly defined results:

Module 1: Determination of optimization 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
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.

Selection and Ordering Data

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More information

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Additional information is available on the Internet at:
www.siemens.de/ec
**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.

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D) Subject to export regulations: AL: N, ECCN: EAR99T

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www.siemens.de/ec
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.

**Overview**

**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

**Design**

The Premium Service "Material flow optimization" consists of three modules which build upon each other and which can be ordered individually:

**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.
### Selection and Ordering Data

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### More Information

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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
  - 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.
S7 SmartLabel: Generation of I/O labeling strips

Overview

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, symbol 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 pin-point 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

Order No.

S7-SmartLabel V3.0
for SIMATIC PCS 7 V6/V7
Engineering software, software class A, 2 languages (German, English), single license for one installation
Type of delivery: Software CD and license key on USB stick
Order No.: 2XV9 450-1SL03-0YX0 C)

Upgrade S7-SmartLabel to V3.0
Engineering software, software class A, 2 languages (German, English), single license for one installation
Type of delivery: Software CD and license key on USB stick
Order No.: 2XV9 450-1SL03-0YX4 C)

Label sheets

• Centralized I/O for SIMATIC PCS 7

See under Accessories in chapter "S7-400" of Catalog ST 70

• Distributed I/O for SIMATIC PCS 7

See the respective distributed I/O modules in the chapter "Distributed I/O" of Catalog IK PI

More information

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Additional information is available on the Internet at: www.siemens.de/s7-smartlabel
## Appendix

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Appendix
Online Services

Information and Ordering
in the Internet and on DVD

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
http://www.siemens.com/automation
you will find everything you need to know about products, systems and services.

Product Selection Using the Offline Mall of Industry

Detailed information together with convenient interactive functions:
The Offline Mall 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 Offline Mall CA 01 can be found in the Internet under
http://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:
http://www.siemens.com/industrymall
Our Service & Support accompanies you worldwide in all concerns related to the automation and drive technology of Siemens. In more than 100 countries directly on site and covering all phases of the life cycle of your machines and plants. Round the clock.

An experienced team of specialists with their combined know-how is ready to assist you. Regular training courses and a close contact of our employees among each other - also across continents - assure a reliable service for multifaceted scopes.

**Online Support**

The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the Shop.

http://www.siemens.com/automation/service&support

**Technical Support**

Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

http://www.siemens.com/automation/support-request

**Engineering Support**

Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project.

**Field Service**

With Field Service, we offer services for startup and maintenance essential for ensuring system availability.

**Spare Parts and Repairs**

In the operating phase of a machine or automation system, we provide a comprehensive repair and spare parts service ensuring the highest degree of plant availability.

**Optimization and Upgrading**

After startup or during the operating phase, additional potential for increasing productivity or for reducing costs often arises. For this purpose, we offer you high-quality services in optimization and upgrading.

You find contact details in the Internet under:

http://www.siemens.com/automation/service&support
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:
http://www.siemens.com/automation/service&support

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
Siemens Solution Partner
Automation, Power Distribution and PLM

Overview

Solution Partner Finder
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 database 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.

The following search criteria are possible:
- Country
- Technology
- Sector
- Company
- Zip code

Once you have located a partner, you are only one small step from contacting them.

You can locate the Solution Partner Finder as follows:
http://www.siemens.com/automation/partnerfinder

Additional information on the Siemens Solution Partner Program is available online at:
http://www.siemens.com/automation/solutionpartner

Siemens Solution Partner
Solution Partner Automation, Power Distribution and PLM

The products and systems from Siemens Industry Automation and Drive Technologies offer the ideal platform for all automation applications.

Under the name Siemens Solution Partner, selected system integrators operate around the world as uniformly qualified solution providers for the portfolio of Siemens automation, power distribution and product lifecycle management products. 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 Solution Partner emblem is a guarantee of quality.
The basis for this is to be found in four defined quality features:
- Solution quality:
  A good result in every case based on proven solution know-how.
- Expert quality:
  Certified technical competence guarantees maximum efficiency.
- Project quality:
  Straight to the goal with proven project experience.
- Product range quality:
  Comprehensive portfolio for state-of-the-art solutions from a single source.
Software Licenses

Overview

Software types
Software requiring a license is categorized into types. The following software types have been defined:

- Engineering software
- Runtime software
- ServicePack
- PowerPack
- Factory license
- Certificate of license
- Downgrading
- Delivery versions
- Single license
- Floating license
- Rental license
- Trial license

Engineering software
This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Runtime software
This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

License types
Siemens Industry Automation & Drive Technologies offers various types of software license:

- Single license
- Floating 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.

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).

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.

- PowerPack
- Upgrade

ServicePack
ServicePacks are used to debug existing products. Service Packs 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.

- 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).

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Appendix

Conditions of sale and delivery
Export regulations

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| E   | Export Classification Number

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for Industry Automation, Drive Technologies and Low Voltage Distribution

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D 11.1
Standard Inverters
SINAMICS G110D, SINAMICS G120D
Distributed Inverters
D 11
SINAMICS G130 Drive Converter Chassis Units
SINAMICS G150 Drive Converter Cabinet Units
D 12
Medium-Voltage Converters
SINAMICS S120 Chassis Format Units and Cabinet Modules
SINAMICS S150 Converter Cabinet Units
D 13.1
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SIMOTION, SINAMICS S120 and Motors for Production Machines
SINAMICS S110
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IEC Squirrel-Cage Motors
MOTOX Geared Motors
Automation Systems for Machine Tools SIMODRIVE
• Motors
• Converter Systems SIMODRIVE 611/POSMO
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• Motors
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SINUMERIK & SINAMICS
Equipment for Machine Tools
SIMOTION, SINAMICS S120 and Motors for Production Machines
SINAMICS S110
The Basic Positioning Drive
Low-Voltage Controls and Distribution –
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