Add-ons for the SIMATIC PCS 7 process control system

Catalog ST PCS 7.1 • June 2008
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### **A&D Mall**

*Internet: [www.siemens.de/automation/mall](http://www.siemens.de/automation/mall)*

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1) Available in German only. See your local Siemens representative for further information.
Supersedes: Catalog ST PCS 7.1 · April 2007

The products contained in this catalog can also be found in the e-Catalog CA 01. Order No.:
E86060-D4001-A100-C7-7600 (CD-ROM)
E86060-D4001-A500-C7-7600 (DVD)

Please contact your local Siemens branch

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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.
Add-ons for SIMATIC PCS 7

As a process control system within the company-wide automation concept Totally Integrated Automation (TIA), SIMATIC PCS 7 with its integrated data storage, communication and configuration offers an open basis for modern, future-oriented and economical automation solutions in all sectors of the processing industry as well as in the production and hybrid industries (combination of continuous/batch processes and discrete manufacture).

In the TIA network, SIMATIC PCS 7 can not only assume the usual process-control tasks, but can also automate secondary processes (e.g. filling, packaging) or incoming/outgoing goods logistics (e.g. material feeding, storage) for a production site. By connecting the automation level to the IT world, the process data is available throughout the company for the evaluation, planning, coordination and optimization of operating sequences, production and business processes.

With its future-oriented design, modular and open architecture based on the latest SIMATIC technology, the consistent use of industrial standards and the control system functionality combined with high performance, the SIMATIC PCS 7 process control system permits the cost-effective implementation and economic operation of instrumentation and control systems in all phases and taking into account the following aspects: from planning, engineering, commissioning, training, to maintenance and repair, right up to expansion and retrofitting.

The modularity, flexibility, scalability and openness of SIMATIC PCS 7 offer ideal conditions for integrating additional components and solutions into the process control system and completing and extending their functionality in this way.
Since SIMATIC PCS 7 was launched on the market, we at Siemens as well as our external partners have developed a host of supplementary components that we refer to in short as PCS 7 add-ons.

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

This catalog will make it easier for you to find the right products for your specific solution.
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 "Further 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 detailed addresses with fax and e-mail details can be found in the annex 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 "Further 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 is not responsible for the contents of these web sites, nor does Siemens adopt these web sites and their contents as their own, as Siemens does not control the linked information and cannot be held responsible for the contents and information they contain. You therefore use these links at your own risk.

Pricing information

Pricing information for the products with order numbers in this catalog can be obtained via the interactive CD-ROM Catalog CA 01, the A&D 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 "Further information".

Marking for SIMATIC PCS 7 V7

The add-on products offered in this catalog are specified for the SIMATIC PCS 7 Versions 5, 6 and 7. Some of the products can only be used in conjunction with one SIMATIC PCS 7 version, while others can be used with all versions. The possible application is specified for each product. All products that can be used for SIMATIC PCS 7 V7 are additionally identified by the following logo:

PCS 7 Add-on fit for SIMATIC PCS 7 V7

Internet

The Catalog ST PCS7.1 can also be downloaded from the Internet. The download can be found at the SIMATIC PCS 7 web site: www.siemens.com/simatic-pcs7
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A plant information system (PIMS) is an information system for company/plant-independent short-term/long-term archiving and for evaluation and display of process and production data.

The products described here (interfaces and tools) support cost-effective collaboration between SIMATIC PCS 7 including SIMATIC BATCH and the plant information systems:

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

The interfaces and tools for optimum combination of PI System and aspenOne with SIMATIC PCS 7 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 addresses, 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 variables cyclically from SIMATIC PCS 7, and save these in the PI long-term archive. The PI-CONNECT @PCS 7 interface uses the following interfaces for communication with SIMATIC PCS 7:

- @PCS 7 system interface
- PI-CONNECT OPC+ interface
- OpenPCS 7 interface
- OPC interface

The two interfaces are operated on a separate interface PC on the OS-LAN (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

PI-CONNECT @PCS 7 and PI-CONNECT OPC+ can be used together with SIMATIC PCS 7 V5, V6 and V7.

**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 V5, V6 and V7.

**PI-CONNECT TREND tool**

Process data from the PI archive can be output using PI-CONNECT TREND as clear and informative trend views in SIMATIC PCS 7 OS process displays. Independent of the plant or plant section, you can then display an additional information concern the process (based on the PI long-term archives) directly on the operator system of the process control system.

PI-CONNECT TREND can be used together with SIMATIC PCS 7 V5, V6 and V7.

**PI-CONNECT CONFIG tool**

PI-CONNECT CONFIG works together with PI CONNECT @PCS 7, PI-CONNECT OPC+ and the OPC interface of OSIsoft. The tool provides convenient support for creation and easy updating of the PI system project for the SIMATIC PCS 7 link. 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 V5, V6 and V7.
aspenOne-PCS 7-CONNECT

IP.21-CONNECT OPC+ interface

The IP.21 CONNECT OPC+ interface reads the process variables cyclically from SIMATIC PCS 7 and saves these in the IP.21 long-term archive. The IP.21 CONNECT OPC+ operated on a separate interface PC on the OS-LAN of the SIMATIC PCS 7 process control system supports:

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

IP.21 CONNECT OPC+ can be used together with SIMATIC PCS 7 V5, V6 and V7.

IP.21-CONNECT BATCH interface

The IP.21 CONNECT BATCH interface transfers data from SIMATIC BATCH to the IP.21 archive. Together with the IP.21 CONNECT OPC+ interface, reports and evaluations based on batch data and process data can be implemented in the IP.21 system. Further functionalities of IP.21 CONNECT BATCH include:

- Archive recovery
- Microsoft Excel add-in for reports

IP.21 CONNECT BATCH can be used together with SIMATIC BATCH V6 and V7 (SIMATIC PCS 7 V6, V6.1 or V7).

More information

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http://www.siemens.com/mis-pcs7
PCS 7 OCS is an open interface by means of which other applications can easily access data and data structures of SIMATIC PCS 7 from a wide variety of application areas via a network. The interface is based on the open, platform-independent communications standard ACPLT/KS. The data are transmitted by TCP/IP without using the Windows basic technologies COM and DCOM. In this manner it is possible to achieve extremely stable and firewall-compatible communication throughout the network.

**Function**

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 respective OS server is necessary. In the case of redundant systems, PCS 7 OCS must be installed on both OS servers of a server pair.

Using PCS 7 OCS, the applications can read and write configuration and process variables and also read all process value archives of the TagLogging and alarm logs of the AlarmLogging. Using inquiry functions it is additionally possible to search for data objects with specific properties of the same type (e.g. types of function block, parameter types, etc.). Since the interfacing is implemented by autoconfiguration, the applications need not be specifically configured for the interface connection.

**Standard client applications**

The following standard client applications are available:

- **System browser KS Magellan Pro**
  Using KS Magellan Pro it is possible to search and read the complete PCS 7 OCS database via Internet from a PC workstation. KS Magellan Pro is versatile in its application: for the function test during commissioning as well as for online queries of process values, process archives and alarm logs during operation.

- **Database coupler KSHistBuilder**
  The KSHistBuilder can be used to cyclically transfer archives or online data from SIMATIC PCS 7 to an SQL database. No configurations are required to transfer archives. Existing archives are automatically discovered, and transferred without gaps to the database, even if the communication fails briefly. In addition to trends, it is possible to read alarm logs and to transfer these to an open database or operating data acquisition system.

- **Excel add-in**
  Using this Microsoft Excel expansion, it is possible to read process values, process archives and alarm logs from SIMATIC PCS 7 manually or cyclically into Excel.

- **SAP coupling**
  The SAP coupling permits simple transfer of data from SIMATIC PCS 7 to SAP. The SAP coupling can be used, for example, to continuously transfer runtime meter data and fault messages to the SAP PlantMaintenance (PM) module. Furthermore, all other SAP modules can be coupled to SIMATIC PCS 7.

- **Web server with dynamically generated HTML sites**
  The web server is used to provide individually designed web sites with up-to-date data directly from the process control system.

The PCS 7 OCS interface is exceptionally suitable for linking external applications to SIMATIC PCS 7 using autoconfiguration functions or simply to read data from the process control system. A PCS 7 OCS license allows use of the following functions:

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

Data exchange between the OS server and the application is extremely powerful. It is based on the TCP/IP communications protocol, an open standard supported by the vendors of many control systems.

By omitting Windows communications technologies such as COM/DCOM, PCS 7 OCS can also be used without problem in distributed networks connected through firewall functions. No configuration operations are required to install PCS 7 OCS.
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### More information

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http://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 matches the plant documentation to the current data of the process control system without delay, and records any changes in change logs.

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 V5, V6 and V7.

**Benefits**
- Standardized documentation of process objects
- Fast and correct comparison of data in process control system and feature specification: Changes to customized parameters are completely documented, e.g.: limit values, 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 for the support engineers

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

**Technical specifications**

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

**More information**
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ACRON is a product for system optimization, 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

- **Reporter:**
  - Convenient operator interface for printing of reports and logs with input facility for laboratory values

- **Graph:**
  - User-friendly presentation and analysis of measured values and statistical values in trends

- **Fault and maintenance module:**
  - Generation of all required fault and message reports as well as comprehensive statistics

- **AC Job:**
  - Administration module for automatic printing of reports including sending by e-mail

- **Data Collect:**
  - Combination of any values from various ACRON applications

- **Excel Add-In:**
  - Convenient access to all data

- **AC Mirror:**
  - Up to 8-fold database redundancy

**More information**

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Overview

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

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

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

By carefully applying advanced modern control procedures (Advanced Process Control, APC), the process industry has real leverage available for reducing costs and increasing quality. Of all the modern control procedures, Model Predictive Control (MPC) has emerged as the most suitable approach in numerous applications. MPC simplifies the handling of complex plant dynamics, permits the early elimination of faults, takes into consideration the plant limitations, and allows complex process control strategies.

The use of Advanced Process Control extends SIMATIC PCS 7 with the function of "process optimization”. This creates a link between the planning and scheduling functions of the execution level and the process control functions of the control level.

INCA

This procedure is also used by INCA, a multi-variable controller of the latest generation. INCA 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 (or GlassExpert) software itself runs on a separate PC under the Windows NT/2000/XP operating system.

Note: INCA can be used together with SIMATIC PCS 7 V5, V6 and V7.

Application

INCA for the glass industry

Preconfigured solutions based on INCA are available specially 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 for the chemical industry, application examples

- Ammonia plants
  - Increase in throughput by up to 1%
  - Increase in steam export by up to 1%
  - Reduction in specific gas consumption by up to 1%
  - Increased plant availability
  - Less sensitive to changes in gas condition
- Polymer plants
  - More flexible operation (faster change of product)
  - Production on request

More information

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Overview

Online determination of quality variables

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

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

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

Presto: Soft sensors for non-measurable quality variables

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.

Presto 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:
Presto can be used together with SIMATIC PCS 7 V5, V6 and V7.

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.)

Presto sets new standards for the permanent plant-wide optimization and control of non-linear processes. Presto 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.

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

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Additional information is available in the Internet under:
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Overview

The PCS 7 PID Tuner is offered as an option for the CFC Editor and 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 RaPID 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. RaPID can run on standard PCs with the Windows NT/2000/XP 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 capable of processing the file formats of Microsoft Access, Microsoft Excel, MATLAB and INCATest, as well as all types of ASCII files. RaPID 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:
RaPID can be used together with SIMATIC PCS 7 V5, V6 and V7.

Function

RaPID differs from other controller setting packages as follows:
- 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 RaPID, 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, e.g. using INCA.

More information

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Additional information is available in the Internet under:
http://www.ipcos.com
Overview

In practice, conventional PID controllers are often operated in the manual mode because the control quality achieved does not match the expectations. The reason for this is that the controllers are either badly adjusted or the processes are difficult to control with PID controllers, e.g. temperature systems, processes with any proportion of dead time component, or processes that change depending on time or operating point. In addition, the optimum setting of PID controllers demands special experience and is very time-consuming.

A recommended alternative for solving these problems is the adaptive ADCO controller. It works on the basis of a process model that is determined in the background during the setting procedure. With the aid of this process model, ADCO can predict the consequences of an intervention in the process (predictive controller), e.g. what effect the opening of a steam valve up to a certain extent has on the process temperature. Conversely, it is also in a position to determine the valve setting required for achieving or maintaining a defined temperature. With the process model, ADCO has more process information at its disposal than conventional controllers and uses this to improve the quality of control.

Multi-range controller for non-linear systems

ADCO is also available as a multi-range controller (ADMR). The special feature of this type of controller is that the control range can be divided into as many as 8 zones which can be individually optimized. The switchover between the zones can be automatic or event-based.

Application

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

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

Note:
The adaptive controller ADCO can be used together with SIMATIC PCS 7 V5, V6 and V7.

Technical specifications

ADCO

- Hardware requirements
  SIMATIC PCS 7 V5.x or higher with AS 41x automation systems
- Memory requirement
  21 KB (once only) + 5 KB (per controller)
- Computing time
  Approx. 2 ms (S7-416)

More information

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Fax: +49 69 950418-19
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Additional information is available in the Internet under:
http://www.ipas-systeme.de
Overview

MATLAB/SIMULINK is a universal mathematical software tool with a host of functions for control engineering, information processing, model creation, optimization, and 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 V5, V6 and V7.

Application

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

Typical procedures in developing Advanced Process Control solutions:

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

<table>
<thead>
<tr>
<th>Order No.</th>
<th>MATLAB/SIMULINK-DDE client for SIMATIC PCS 7 V5, V6 and V7</th>
</tr>
</thead>
<tbody>
<tr>
<td>2XV9 450-1WC12-0LA0</td>
<td>C)</td>
</tr>
</tbody>
</table>
Overview

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

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

Note: FuzzyControl++ can be used together with SIMATIC PCS 7 V5, V6 and V7.

Application

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

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

Function

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

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

Selection and Ordering Data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>FuzzyControl++ for SIMATIC PCS 7 V7 (V7.0 + SP1 and higher)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2XV9 450-1WC10-0AA1</td>
<td>Configuration tool running under Windows 2000 and XP, MPI license, S7 blocks for one application, manual, German and English</td>
</tr>
<tr>
<td>2XV9 450-1WC10-0PA0</td>
<td>FuzzyControl++ PCS 7 package CFC runtime module with faceplates, SIMATIC PCS 7 V7.0 + SP1 and higher</td>
</tr>
<tr>
<td>2XV9 450-1WC11-4XA0</td>
<td>FuzzyControl++ S7 and CFC copying license for further data blocks</td>
</tr>
</tbody>
</table>

More information

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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, are capable of learning, and can organize themselves. Their parallel structure additionally results in very fast operation.

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 (V7.0 + SP1 and higher)</th>
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</thead>
<tbody>
<tr>
<td>NeuroSystems D+E basic license V5.1</td>
</tr>
<tr>
<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 over MPI, S7 blocks (FBs) for one application</td>
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<tr>
<th>NeuroSystems SIMATIC PCS 7 package</th>
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<tr>
<td>CFC runtime module with face-plates for one application, SIMATIC PCS 7 V7.0 + SP1 and higher</td>
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<td>2XV9 450-1WC15-0PA0</td>
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<tr>
<th>NeuroSystems S7 and CFC copy license for further SIMATIC PCS 7/S7 applications</th>
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<tr>
<td>2XV9 450-1WC16-4XA0</td>
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(C) Subject to export regulations: AL: N, ECCN: EAR99S

### More information

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Additional information is available in the Internet under:  
http://www.siemens.com/neurosystems
Industry-specific applications

4/2  Cement industry
4/2  CEMAT: Software for the cement industry
4/5  ECS/CemScanner: Monitoring of temperature in kiln jacket
4/6  ECS/ProcessExpert: Specialized for process optimization

4/7  Telecontrol
4/7  SIMATIC PCS 7 TeleControl: Integration of widely distributed outstations
4/10 PCS 7 TeleControl Engineering Station
4/11 PCS 7 TeleControl Operator System
4/13 SIPLUS RIC Compact: Modular telecontrol outstations
4/17 SIPLUS RIC IEC on S7: AS coupling to a host control center
4/20 SINAUT ST7: Telecontrol system based on SIMATIC S7
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
- 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).

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

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

Notes on delivery

CEMAT can be supplied in two versions:

- CEMAT V7.0 (current version; for new plants), can be used on system platform SIMATIC PCS 7 V7.0
- CEMAT V6.1 (alternative, particularly for plant expansions), can be used on system platform SIMATIC PCS 7 V6.1

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>CEMAT V7.0 software packages</th>
</tr>
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<tbody>
<tr>
<td>6DL5 436-8AX07-0XA0</td>
<td>CEMAT OSENG V7.0</td>
</tr>
<tr>
<td>6DL5 434-8AA07-0XA0</td>
<td>Engineering software, 2 languages (German, English), executes with Windows Server 2003/XP Professional, Single License for 1 installation</td>
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<tr>
<td>6DL5 434-8AB07-0XA0</td>
<td>Type of delivery: software and documentation on CD, license key disk, Certificate of License</td>
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<table>
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<tr>
<th>Order No.</th>
<th>CEMAT OS software for single station incl. AS runtime licenses (PLC)</th>
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<tbody>
<tr>
<td>6DL5 434-8AA07-0XA0</td>
<td>CEMAT OSRT3 V7.0 (3 AS)</td>
</tr>
<tr>
<td>6DL5 434-8AB07-0XA0</td>
<td>OS software Single Station Runtime incl. 3 runtime licenses for AS (PLC), 2 languages (German, English), executes with Windows Server 2003/XP Professional, Single License for 1 installation</td>
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<tr>
<td>6DL5 434-8AC07-0XA0</td>
<td>Type of delivery: software and documentation on CD, license key disk, Certificate of License</td>
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<tr>
<td>6DL5 434-8AX07-0XA0</td>
<td>CEMAT OSRT6 V7.0 (6 AS)</td>
</tr>
<tr>
<td>6DL5 435-8AX07-0XA0</td>
<td>OS software Single Station Runtime incl. 6 runtime licenses for AS (PLC), 2 languages (German, English), executes with Windows Server 2003/XP Professional, Single License for 1 installation</td>
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<tr>
<td>6DL5 433-8AD07-0XA0</td>
<td>Type of delivery: software and documentation on CD, license key disk, Certificate of License</td>
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<th>Order No.</th>
<th>CEMAT OS Power Packs for redundant pair of servers</th>
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<tbody>
<tr>
<td>6DL5 433-8AC07-0XD0</td>
<td>CEMAT PRSRT6 V7.0 for expansion from 3 to 6 AS</td>
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<tr>
<td>6DL5 433-8AD07-0XD0</td>
<td>CEMAT PRSRTU V7.0 for expansion from 9 to unlimited AS</td>
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<tr>
<td>6DL5 434-8AX07-0XA0</td>
<td>CEMAT RSRT9 V7.0 (9 AS)</td>
</tr>
<tr>
<td>6DL5 433-8AD07-0XA0</td>
<td>OS software Runtime for redundant pair of servers incl. runtime licenses for 9 AS (PLC), 2 languages (German, English), executes with Windows Server 2003, Single License for 2 installations</td>
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<tr>
<td>6DL5 434-8AB07-0XA0</td>
<td>Type of delivery: software and documentation on CD, license key disk, Certificate of License</td>
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<tr>
<th>Order No.</th>
<th>CEMAT BOX 416 Runtime System V7.0 (3 AS)</th>
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<tbody>
<tr>
<td>6DL5 433-8AC07-0XD0</td>
<td>CEMAT MC V7.0</td>
</tr>
<tr>
<td>6DL5 433-8AD07-0XD0</td>
<td>OS software Client Runtime, 2 languages (German, English), executes with Windows XP Professional, Single License for 1 installation</td>
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<td>6DL5 433-8AB07-0XA0</td>
<td>Type of delivery: software and documentation on CD, license key disk, Certificate of License</td>
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<tr>
<td>6DL5 433-8AAA07-0XA0</td>
<td>CEMAT RSRT3 V7.0 (3 AS)</td>
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<tr>
<td>6DL5 433-8AB07-0XA0</td>
<td>OS software Runtime for redundant pair of servers incl. runtime licenses for 6 AS (PLC), 2 languages (German, English), executes with Windows Server 2003, Single License for 2 installations</td>
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<th>Order No.</th>
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<tr>
<td>6DL5 433-8AA07-0XA0</td>
<td>CEMAT RSRT6 V7.0 (6 AS)</td>
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<tr>
<td>6DL5 433-8AC07-0XD0</td>
<td>OS software Runtime for redundant pair of servers incl. runtime licenses for 6 AS (PLC), 2 languages (German, English), executes with Windows Server 2003, Single License for 2 installations</td>
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<tr>
<td>6DL5 433-8AD07-0XD0</td>
<td>Type of delivery: software and documentation on CD, license key disk, Certificate of License</td>
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Subject to export regulations: AL: N, ECCN: 5D992B1
# Industry-specific applications

## Cement industry

**CEMAT: Software for the cement industry**

### Selection and Ordering Data

<table>
<thead>
<tr>
<th>CEMAT V6.1 software packages</th>
<th>Order No.</th>
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</thead>
<tbody>
<tr>
<td>CEMAT engineering software</td>
<td></td>
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</tbody>
</table>

**CEMAT OSENG V6.1**
Engineering software, 2 languages (German, English), executes with Windows 2000 Professional/XP Professional, Single License for 1 installation

Type of delivery: software and documentation on CD, license key disk, Certificate of License

Order No.: 6DL5 436-8AX16-0XA0

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**CEMAT OSRT3 V6.1 (3 AS)**
OS software Single Station Runtime incl. 3 runtime licenses for AS (PLC), 2 languages (German, English), executes with Windows 2000 Professional/XP Professional, Single License for 1 installation

Type of delivery: software and documentation on CD, license key disk, Certificates of License

Order No.: 6DL5 434-8AA16-0XA0

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**CEMAT MC V6.1**
OS software Client Runtime, 2 languages (German, English), executes with Windows 2000 Professional/XP Professional, Single License for 1 installation

Type of delivery: software and documentation on CD, license key disk, Certificate of License

Order No.: 6DL5 435-8AX16-0XA0

### More information

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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 V5 and V6.

Benefits

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

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

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

Application

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

Special features of the ECS/CemScanner system:
- Refractory control:
  Graphic display and management of lining for kiln maintenance
- Brick thickness:
  Online calculation and graphic display of brick and lining thickness
- Live ring migration:
  Exact calculation and online monitoring of distance between ring and kiln jacket
- Fan control:
  Automatic starting/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

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Additional information is available in the Internet under:
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Industry-specific applications

Cement industry

ECS/ProcessExpert: Specialized for process optimization

Overview

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

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

Note:
ECS/ProcessExpert can be used together with SIMATIC PCS 7 V5 and V6.

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
Fax: +45 3618 2799
E-mail: fls@flsautomation.com

Additional information is available in the Internet under:
http://www.flsautomation.com
**Overview**

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

With many SIMATIC PCS 7 projects, especially in the water & wastewater and oil & gas industries, the high requirements placed on local automation are supplemented by the necessity to integrate the automation of widely distributed plant sections into the process control system using telecontrol protocols.

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, meaning that small automation stations can be used. SIMATIC PCS 7 TeleControl particularly supports the following outstations:

- SINAUT ST7 on the basis of SIMATIC S7-300/S7-400
- SIPLUS RIC (Remote Interface Controller)

These two types are presented separately in other sections of this catalog.

**Note:** SIMATIC PCS 7 TeleControl can be used together with SIMATIC PCS 7 V7.

**Benefits**

As a result of its high level of integration, automation based on SIMATIC PCS 7 offers decisive advantages compared to previous automation solutions with telecontrol engineering. The uniform SIMATIC PCS 7 software platform allows high efficiency during operation, and results in low costs for training, configuration and servicing. The homogenous GUI for local and remote processes simplifies operation and simultaneously reduces the risk of an operator error.

The engineering tool "Data Base Automation" (DBA) efficiently supports engineering while ensuring conformity with SIMATIC PCS 7 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.

The SINAUT ST7 telecontrol protocol supported by SIMATIC PCS 7 TeleControl is particularly characterized by the following features:

- Tolerant with regards to slow transmission links
- Good time resolution for all process events 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 through use of event-driven protocol scheme 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)
- Automatic monitoring and status control of all telecontrol stations including alarm output on failure of station or connection
- Direct programming and parameterization of the outstations via the telecontrol connection, independent of the transmission medium used

Plant sections located outdoors and possessing a Modbus infrastructure can be integrated into SIMATIC PCS 7 using the Modbus protocol over serial lines or TCP/IP connections, and thus migrated.

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

The SIMATIC PCS 7 TeleControl architecture with local and widely distributed automation stations...
Industry-specific applications

Telecontrol

SIMATIC PCS 7 TeleControl:
Integration of widely distributed outstations

Application

Water/wastewater industry
• Well, pumping and valve stations in water supply networks
• Rain-overflow basin and draw works in wastewater networks

Oil/gas industry
• 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

Further industries (power, environment, transportation)
• Monitoring and control of small distributed stations, data recording and transmission

Design

The SIMATIC PCS 7 TeleControl range includes the following products:

• PCS 7 TeleControl OS Engineering V7.0 (unlimited POs)
  for OS engineering, comprising:
  - SIMATIC PCS 7 Engineering Software V7.0
  - PCS 7 TeleControl OS DBA V7.0 Software
  - Library with PCS 7 TeleControl OS faceplates and symbols

• PCS 7 TeleControl OS Engineering Upgrade V7.0
  (unlimited POs)
  for extending an existing SIMATIC PCS 7 Engineering Station V7.0 for PCS 7 TeleControl, comprising:
  - PCS 7 TeleControl OS DBA V7.0 Software
  - Library with PCS 7 TeleControl OS faceplates and symbols

• PCS 7 TeleControl OS Single Station V7.0 (250 POs)
  for an OS single station, comprising:
  - SIMATIC PCS 7 OS Software Single Station V7.0
  - PCS 7 TeleControl Runtime Software
  - Library with PCS 7 TeleControl OS faceplates and symbols

• PCS 7 TeleControl OS Server V7.0 (250 POs)
  for a single OS server, comprising:
  - SIMATIC PCS 7 OS Software Single Station V7.0
  - PCS 7 TeleControl Runtime Software
  - Library with PCS 7 TeleControl OS faceplates and symbols

• PCS 7 TeleControl OS Redundant Server V7.0 (250 POs)
  for a redundant pair of OS servers, comprising:
  - SIMATIC PCS 7 Server Redundancy V7.0
  - PCS 7 TeleControl Runtime Software
  - Library with PCS 7 TeleControl OS faceplates and symbols

• PCS 7 TeleControl OS Server Upgrade V7.0
  for extending an existing SIMATIC PCS 7 OS V7.0 (server/single station) for PCS 7 TeleControl, comprising:
  - PCS 7 TeleControl Runtime Software
  - Library with PCS 7 TeleControl OS faceplates and symbols

• PCS 7 TeleControl SINAUT Driver
  for use of the SINAUT protocol driver together with the PCS 7 TeleControl Runtime Software on a server or single station

• PCS 7 TeleControl Modbus Driver
  for use of the Modbus protocol driver together with the PCS 7 TeleControl Runtime Software on a server or single station

Further drivers to support the standardized IEC 870-5-101, IEC 870-5-104 and DNP V3 protocols will be available soon.

Multi-client and double-channel functionality

Data from SIMATIC PCS 7 automation systems can be viewed 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.

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

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

No additional automation system for conditioning and connecting the TeleControl-specific data need be planned in the SIMATIC PCS 7 system.

Serial interfacing of the outstations can be implemented at low cost using SINAUT TIM communication modules (SINAUT ST7 communication protocol) or TCP/IP serial converters (Modbus communication protocol) connected directly to the PCS 7 TeleControl OS (single station or server).

The outstations can also be connected per Ethernet TCP/IP to the SIMATIC PCS 7 plant bus, either directly or via TCP/IP WAN router.

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

<table>
<thead>
<tr>
<th>Type of outstation</th>
<th>SINAUT ST7</th>
<th>SIPLUS RIC</th>
<th>Existing third-party station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of communication</td>
<td>Serial</td>
<td>Ethernet TCP/IP</td>
<td>Serial</td>
</tr>
<tr>
<td>Communication protocol</td>
<td>SINAUT ST7</td>
<td>SINAUT ST7</td>
<td>Modbus</td>
</tr>
<tr>
<td>Interface on the PCS 7 TeleControl OS</td>
<td>SINAUT TIM</td>
<td>SINAUT TIM</td>
<td>Integral Modbus interface</td>
</tr>
<tr>
<td>Interface of outstation</td>
<td>SINAUT TIM</td>
<td>SINAUT TIM</td>
<td>TCP/IP converter - serial</td>
</tr>
</tbody>
</table>

Current connection possibilities for widely distributed automation systems (TeleControl outstations)

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

Many media – e.g. dedicated lines, dial-up connections or radio systems – are suitable for communication between the supervisory control system (telecontrol center integrated in SIMATIC PCS 7 through SIMATIC PCS 7 TeleControl) and the outstations.

TCP/IP-based technologies such as DSL or GPRS are frequently used in new plants.

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.

**Function**

SIMATIC PCS 7 TeleControl supports the SINAUT ST7 and Modbus protocols via both serial and TCP/IP connections. Support for further protocol standards such as IEC 670-5-101/-104 or DNP V3 will be available soon.

When linking SINAUT ST7 stations, 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 times of the SINAUT outstations can be synchronized by PCS 7 TeleControl OS.

In the case of larger plants, the PCS 7 TeleControl OS servers can also have a redundant design. All internally generated information (e.g. alarm states and results of calculations) are matched in a redundant pair of PCS 7 TeleControl OS servers.

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 by new script-based block types specific to the project.

**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: [http://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 V7.0**

The PCS 7 TeleControl OS Engineering V7.0 software package is required to configure a SIMATIC PCS 7 TeleControl engineering station on a SIMATIC PCS 7 industrial workstation, single station version (SIMATIC PCS 7 ES/OS 547B BCE WXP or SIMATIC PCS 7 ES/OS 547B IE WXP).

It consists of the following components:

- SIMATIC PCS 7 Engineering Software V7.0 for OS, unlimited POs (see section “ES Software” in chapter “Engineering System” of the current Catalog ST PCS 7)
- PCS 7 TeleControl OS DBA V7.0
  - Engineering package for creating PCS 7 TeleControl OS applications; contains the TeleControl OS block library for SIMATIC PCS 7.
- SIMATIC PCS 7 Engineering PowerPacks and further 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 Catalog ST PCS 7 for SIMATIC PCS 7 V7.0.
- SIMATIC PCS 7 industrial workstations suitable as basic hardware for a SIMATIC PCS 7 TeleControl engineering station can be found in the Catalog ST PCS 7 for SIMATIC PCS 7 V7.0, chapter “Engineering System”, section “ES Hardware”.

**PCS 7 TeleControl OS DBA V7.0**

PCS 7 TeleControl OS DBA V7.0 is an OS engineering package 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 automatically positions the type-specific block symbols, e.g. controller or analog input (AI), in the process displays. These symbols are linked to the corresponding function blocks and faceplates using the database. Manual configuration is basically limited to the design and positioning of static graphic elements, e.g. pipes 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.

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. PCS 7 TeleControl OS DBA treats the user blocks just like the predefined standard blocks during database generation.

**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 V7.0 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>MeasuredValue</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</td>
</tr>
<tr>
<td>SINAUTRTU</td>
<td>TeleControl interface modules</td>
</tr>
<tr>
<td>MODBUSRTU</td>
<td>Diagnostics of Modbus substations</td>
</tr>
</tbody>
</table>

**Selection and Ordering Data**

<table>
<thead>
<tr>
<th>Order No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6DL5 000-8AF07-0XA5</td>
<td>PCS 7 TeleControl OS Engineering V7.0 (Software package with SIMATIC PCS 7 Engineering Software V7.0, unlimited POs (cannot be used as operator station for productive operation))</td>
</tr>
<tr>
<td></td>
<td>One language (English), executes with Windows XP Professional/Server 2003, Floating License for 1 user</td>
</tr>
<tr>
<td></td>
<td>Electronic documentation, two languages (German, English), on CD “PCS 7 TeleControl Add On V7.0” and PCS 7 Toolset DVD</td>
</tr>
<tr>
<td></td>
<td>Type of delivery:</td>
</tr>
<tr>
<td></td>
<td>• License Key Disk, Certificate of License, Terms and Conditions</td>
</tr>
<tr>
<td></td>
<td>• PCS 7 V7.0 Toolset DVDs, Microsoft SQL Server 2005 including EULA, as well as supplementary CDs/DVDs (e.g. Microsoft ServicePacks and tools)</td>
</tr>
<tr>
<td></td>
<td>• CD “PCS 7 TeleControl Add On V7.0”</td>
</tr>
<tr>
<td>6DL5 000-8AF07-0XE5</td>
<td>PCS 7 TeleControl OS Engineering Upgrade V7.0 (To upgrade an existing SIMATIC PCS 7 Engineering Station V7.0 for PCS 7 TeleControl; software package without SIMATIC PCS 7 Engineering Software V7.0)</td>
</tr>
<tr>
<td></td>
<td>One language (English), executes with Windows XP Professional/Server 2003, Floating License for 1 user</td>
</tr>
<tr>
<td></td>
<td>Electronic documentation, two languages (German, English), on CD “PCS 7 TeleControl Add On V7.0”</td>
</tr>
<tr>
<td></td>
<td>Type of delivery:</td>
</tr>
<tr>
<td></td>
<td>• License Key Disk, Certificate of License, Terms and Conditions</td>
</tr>
<tr>
<td></td>
<td>• CD “PCS 7 TeleControl Add On V7.0”</td>
</tr>
</tbody>
</table>
Overview

The PCS 7 TeleControl OS software packages offered for OS runtime mode are tailored to the architecture of the SIMATIC PCS 7 operator system. 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.

PCS 7 TeleControl faceplate for one count value (extended display with 4 divided windows: continuous and interval-based values, alarm summary, parameter settings, trend display)

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.

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

### Software 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 V7.0</td>
<td>x</td>
</tr>
<tr>
<td>PCS 7 TeleControl OS Server V7.0</td>
<td></td>
</tr>
<tr>
<td>PCS 7 TeleControl OS Redundant Server V7.0</td>
<td></td>
</tr>
<tr>
<td>PCS 7 TeleControl Driver (alternative) SINAUT</td>
<td>x</td>
</tr>
<tr>
<td>Modbus</td>
<td>x</td>
</tr>
</tbody>
</table>

PCS 7 OS Software Client V7.0

See section "OS Software" in chapter "Operator System" of ST PCS 7 Catalog for SIMATIC PCS 7 V7.0

SIMATIC PCS 7 OS Software PowerPacks (single station/server) and further SIMATIC PCS 7 OS software components for the PCS 7 TeleControl operator systems can be ordered in the chapter "Operator System", section "OS Software", of the ST PCS 7 Catalog for SIMATIC PCS 7 V7.0.

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 the ST PCS 7 Catalog for SIMATIC PCS 7 V7.0, chapter "Operator System", section "OS Hardware".

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 (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
- Library with PCS 7 TeleControl OS faceplates and symbols

In addition, a PCS 7 TeleControl Driver license is required for each communications protocol used (e.g. SINAUT/Modbus) per PCS 7 TeleControl OS single station and per PCS 7 TeleControl OS server.
## Selection and Ordering Data

### PCS 7 TeleControl Operator System

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Order No.</th>
<th>Type of Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS 7 TeleControl OS Single Station V7.0</td>
<td>6DL5 001-8AA07-0XA0</td>
<td>License Key Disk, Certificate of License, Terms and Conditions; Electronic documentation, two languages (German, English), on CD &quot;PCS 7 TeleControl Add On V7.0.&quot;</td>
</tr>
<tr>
<td>PCS 7 TeleControl OS Server V7.0</td>
<td>6DL5 002-8AA07-0XA0</td>
<td>License Key Disk, Certificate of License, Terms and Conditions; PCS 7 V7.0 Toolset DVDs, Microsoft SQL Server 2005 including EULA, as well as supplementary CDs/DVDs (e.g. Microsoft ServicePacks and tools); CD &quot;PCS 7 TeleControl Add On V7.0.&quot;</td>
</tr>
<tr>
<td>PCS 7 TeleControl OS Redundant Server V7.0</td>
<td>6DL5 002-8BA07-0XA0</td>
<td>2 License Key Disks, Certificate of License, Terms and Conditions; PCS 7 V7.0 Toolset DVDs, Microsoft SQL Server 2005 including EULA, as well as supplementary CDs/DVDs (e.g. Microsoft ServicePacks and tools); CD &quot;PCS 7 TeleControl Add On V7.0.&quot;</td>
</tr>
<tr>
<td>PCS 7 TeleControl SINAUT Driver V7.0</td>
<td>6DL5 101-8AX07-0XB0</td>
<td>License Key Disk, Certificate of License, Terms and Conditions; Electronic documentation, two languages (German, English), on CD &quot;PCS 7 TeleControl Add On V7.0.&quot;</td>
</tr>
<tr>
<td>PCS 7 TeleControl Modbus Driver V7.0</td>
<td>6DL5 101-8BX07-0XB0</td>
<td>License Key Disk, Certificate of License, Terms and Conditions; Electronic documentation, two languages (German, English), on CD &quot;PCS 7 TeleControl Add On V7.0.&quot;</td>
</tr>
</tbody>
</table>
Overview

Telecontrol systems for controlling and monitoring widely distributed plants usually consist of a supervisory control system (telecontrol center) and one or more outstations connected over large distances for the automation of distributed plant sections. These are primarily used in the oil & gas, water & wastewater, power generation & distribution, and transportation sectors. The outstations are sometimes exposed to extreme climatic conditions.

In the configuration examples of telecontrol systems, the outstations are implemented using SIPLUS RIC (Remote Interface Control). The telecontrol center is integrated seamlessly into the SIMATIC PCS 7 process control system using SIMATIC PCS 7 TeleControl. SIPLUS RIC Compact outstations can communicate with the control center by means of the Modbus protocol over a serial telecontrol connection configurable using various media (electrical/optical). Further modes of communication (Ethernet TCP/IP) and communication protocols (e.g. IEC 870-5-101 or IEC 870-5-104) will be available soon.

The materials required to design a telecontrol link, e.g. converter between TCP/IP and serial, media converter FO, dedicated line modem, electrical or optical dedicated line, are accessories which are not included in this catalog.

SIPLUS RIC Compact is a rugged and modular system with integral process input/outputs whose design and functions are matched to operation as an outstation of a telecontrol system. It is exceptionally suitable for on-site control of small plant sections with small to medium amounts of data.

Note:
SIPLUS RIC Compact can be used together with SIMATIC PCS 7 V7 and SIMATIC PCS 7 TeleControl.
Industry-specific applications

Telecontrol

SIPLUS RIC Compact: Modular telecontrol outstations

Application

SIPLUS RIC Compact can be used as an outstation of a telecontrol system for data management as well as for controlling and monitoring widely distributed processes. The fields of application particularly cover the following sector-specific tasks:

Water & wastewater sector
- Control and monitoring of springs, storage reservoirs and pumping stations
- Management of process and functional data

Oil & gas sector
- Control and monitoring of valve stations
- Communication for compressor stations
- Control of gas/oil wells and gas/water injection plants
- Control and monitoring of refineries and tank farms

Power supply sector
- Remote control and monitoring of power supply
- Control of switch disconnectors

Transportation sector
- Control and monitoring of traffic control systems
- Tunnel monitoring
- Remote control and monitoring of railway stations

Design

The SIPLUS RIC Compact designed with IP20 protection is based on a main module A or D whose integral process inputs/outputs can be flexibly expanded by up to 4 submodules (DI16/AI8/CO16) depending on the application. The modules designed for installation in a housing or cabinet are mounted side-by-side on a DIN rail. The I/O bus of the main module is looped through via supplied connecting cables to the submodules mounted to the right of the main module.

Exceptional features:
- Compact design with varying-voltage power supply and integral inputs/outputs
- Module with rugged stainless steel enclosure, insensitive to electromagnetic irradiation and corrosion
- Electrical (RS 232) or optical connections (main module FO) for linking to control center
- High voltage resistance up to 3.5 kV on the process side
- Can be operated in temperature range from -40 to +70 °C
- LED status displays
- MTBF: 130,000 h

Since the SIPLUS RIC Compact is highly resistant to extreme climatic conditions, cabinet heating and air-conditioning can be omitted. This allows a space-saving design with compact housings in association with small UPS systems or solar panels for the local power supply.

Main modules

SIPLUS RIC Main LAN (left) and SIPLUS RIC Main FO (right) modules
The SIPLUS RIC Main LAN (left) and SIPLUS RIC Main FO modules have the same dimensions: 140 x 240 x 83 (HxWxD in mm). Main differences:

<table>
<thead>
<tr>
<th>Features</th>
<th>SIPLUS RIC Main LAN</th>
<th>SIPLUS RIC Main FO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply:</td>
<td>24 ... 110 V DC</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>110 ... 230 V AC</td>
<td>No</td>
</tr>
<tr>
<td>Integral inputs/outputs</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Relay outputs for command</td>
<td>16 x 1-pole/8 x 2-pole; switching current up to 8 A</td>
<td>16 x 1-pole/8 x 2-pole; switching current up to 8 A</td>
</tr>
<tr>
<td>Analog inputs</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>RS 232 for modem</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fiber-optic</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Ethernet RJ45 (10/100)</td>
<td>1</td>
<td>No</td>
</tr>
<tr>
<td>I/O bus for submodules</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>RS 232 for service</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Selection-relevant differences between SIPLUS RIC Main LAN and FO

### Submodules

SIPLUS RIC Sub CO16 (left), DI16 (center) and AI8 (right)

The SIPLUS RIC Main LAN and SIPLUS RIC Main FO modules can be expanded by the following submodules:

- **SIPLUS RIC Sub DI16**: 16 digital inputs 24 ... 110 V DC, isolated in 2 groups of 8
  - Message recording with 1 ms resolution
  - Message types: Single message, double message, fleeting contact message, slow count value recording
  - Adjustable parameters for each type of message, e.g. chatter disabling
  - Adjustable filter times for further processing of incoming signals: 1/2/4/8/16/32/64 ms

- **SIPLUS RIC Sub AI8**: 8 analog inputs for current measurements (0 ... 20 mA), isolated, self-calibrating
  - Parameterizable input range: ± 2.5 mA, ± 5 mA, ± 10 mA,
  - ± 20 mA or 4 ... 20 mA
  - Resolution 12 bit + sign
  - Accuracy at ± 25 °C: ± 0.25%
  - Open-circuit detection in range 4 ... 20 mA

- **SIPLUS RIC Sub CO16**: 16 relay outputs for command output, isolated
  - Pulse/continuous commands
  - 16 bit setpoint output
  - Switching current up to 5 A

All submodules listed have the same dimensions: 140 x 60 x 83 (H x W x D in mm)

### Function

As an outstation of a telecontrol system, SIPLUS RIC Compact supports serial data exchange with the supervisory control system (control center) via an electrical or optical WAN dedicated line connection per Modbus protocol. The control center, represented by SIMATIC PCS 7 TeleControl, is the Modbus master. At the same time, the SIPLUS RIC Compact outstation is:

- A Modbus slave for communication with the control center
- A Modbus master for communication with up to 32 subordinate outstations (only with SIPLUS RIC Main FO).

Conversion of Modbus over TCP/IP to Modbus serial as well as conversion of the medium (electrical/optical) are carried out using corresponding converters.

SIPLUS RIC Compact convinces as a telecontrol outstation due to:

- Telecontrol functions complying with standards
- Secure data processing and transmission via Modbus
- Simple parameterization for flexible adaptation of data quantity
## Industry-specific applications

### Telecontrol

#### SIPLUS RIC Compact: Modular telecontrol outstations

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main modules</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SIPLUS RIC Main LAN</strong></td>
<td>6AG6 000-0AB02-0AA0</td>
</tr>
<tr>
<td>Power supply 24 to 110 V DC</td>
<td></td>
</tr>
<tr>
<td>• Integral inputs/outputs</td>
<td></td>
</tr>
<tr>
<td>- 16 digital inputs 24 ... 110 V DC, isolated in 2 groups of 8</td>
<td></td>
</tr>
<tr>
<td>- 16 relay outputs for command output (16 x 1-pole or 8 x 2-pole); switching current up to 8 A/up to 16 A (with isolating relay)</td>
<td></td>
</tr>
<tr>
<td>• Integral interfaces</td>
<td></td>
</tr>
<tr>
<td>- 1 x RS 232 for modem</td>
<td></td>
</tr>
<tr>
<td>- 1 x Ethernet, RJ45 (10/100 Mbit/s)</td>
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</tr>
<tr>
<td>- 1 x I/O bus for submodules</td>
<td></td>
</tr>
<tr>
<td>- 1 x RS 232 for service</td>
<td></td>
</tr>
<tr>
<td>• Voltage resistance 3.5 kV</td>
<td></td>
</tr>
<tr>
<td>• Temperature range: -40 ... +70 °C</td>
<td></td>
</tr>
<tr>
<td><strong>SIPLUS RIC Main FO</strong></td>
<td>6AG6 000-0AC11-0AA0</td>
</tr>
<tr>
<td>Power supply 110 to 230 V AC</td>
<td></td>
</tr>
<tr>
<td>• Integral input/outputs:</td>
<td></td>
</tr>
<tr>
<td>- 16 digital inputs 24 ... 110 V DC, isolated in 2 groups of 8</td>
<td></td>
</tr>
<tr>
<td>- 16 relay outputs for command output (16 x 1-pole or 8 x 2-pole); switching current up to 8 A/up to 16 A (with isolating relay)</td>
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</tr>
<tr>
<td>- 4 analog inputs for current measurement, resolution 12 bit + sign</td>
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<td>• Integral interfaces:</td>
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<tr>
<td>- 1 x RS 232 for modem</td>
<td></td>
</tr>
<tr>
<td>- 2 x fiber-optic</td>
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</tr>
<tr>
<td>- 1 x I/O bus for submodules</td>
<td></td>
</tr>
<tr>
<td>- 1 x RS 232 for service</td>
<td></td>
</tr>
<tr>
<td>• Voltage resistance 3.5 kV</td>
<td></td>
</tr>
<tr>
<td>• Temperature range: -40 ... +70 °C</td>
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#### Submodules

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
<th>Order No.</th>
</tr>
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<tbody>
<tr>
<td><strong>SIPLUS RIC Sub DI16</strong></td>
<td>6AG6 000-1AA00-0AA0</td>
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<tr>
<td>I/O submodule for SIPLUS RIC Compact main module</td>
<td></td>
</tr>
<tr>
<td>• 16 digital inputs 24 ... 110 V DC, isolated in 2 groups of 8</td>
<td></td>
</tr>
<tr>
<td>• Message recording with 1 ms resolution</td>
<td></td>
</tr>
<tr>
<td>• Voltage resistance 3.5 kV</td>
<td></td>
</tr>
<tr>
<td>• Temperature range: -40 ... +70 °C</td>
<td></td>
</tr>
<tr>
<td><strong>SIPLUS RIC Sub AI8</strong></td>
<td>6AG6 000-1AB00-0AA0</td>
</tr>
<tr>
<td>I/O submodule for SIPLUS RIC Compact main module</td>
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</tr>
<tr>
<td>• 8 analog inputs for current measurements, isolated, self-calibrating</td>
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</tr>
<tr>
<td>• Parameterizable input range: ± 2.5 mA, ± 5 mA, ± 10 mA, ± 20 mA or 4 ... 20 mA</td>
<td></td>
</tr>
<tr>
<td>• Resolution 12 bit + sign</td>
<td></td>
</tr>
<tr>
<td>• Accuracy at ± 25 °C: ± 0.25%</td>
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<tr>
<td>• Open-circuit detection in range 4 ... 20 mA</td>
<td></td>
</tr>
<tr>
<td>• Voltage resistance 3.5 kV</td>
<td></td>
</tr>
<tr>
<td>• Temperature range: -40 ... +70 °C</td>
<td></td>
</tr>
<tr>
<td><strong>SIPLUS RIC Sub CO16</strong></td>
<td>6AG6 000-1AC10-0AA0</td>
</tr>
<tr>
<td>I/O submodule for SIPLUS RIC Compact main module</td>
<td></td>
</tr>
<tr>
<td>• 16 relay outputs for command output, floating; switching current up to 5 A</td>
<td></td>
</tr>
<tr>
<td>• Pulse/continuous commands</td>
<td></td>
</tr>
<tr>
<td>• 16 bit setpoint output</td>
<td></td>
</tr>
<tr>
<td>• Voltage resistance 3.5 kV</td>
<td></td>
</tr>
<tr>
<td>• Temperature range: -40 ... +70 °C</td>
<td></td>
</tr>
</tbody>
</table>

### Options

As a specialist for complete solutions in the product and system business, we can also offer you turnkey outstations on the basis of SIPLUS RIC Compact, installed in wall enclosures, cabinets or containers. We would be pleased to advise you concerning the configuration and the selection of accessories (for contact addresses, see "Further information").

### More information

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

Additional information is available in the Internet under:

http://www.siemens.com/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.

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

In this case, the IEC 870-5-101 supports classic WAN connections over modems and dedicated lines. Using the IEC 870-5-104 protocol, TCP/IP-based WAN connections such as Internet/DSL or GPRS can be used. 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.

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. For the telecontrol configurations described in this catalog section, use of the SIPLUS RIC IEC on S7 library is independent of SIMATIC PCS 7 TeleControl.

Configuration examples of telecontrol systems with SIMATIC PCS 7 AS on a third-party control center
Telecontrol

Industry-specific applications

SIPLUS RIC IEC on S7:
AS coupling to a host control center

Options

Redundant telecontrol configurations can be implemented analogous to the configurations described in the overview. One example configuration of each of the IEC 870-5-101 (serial) and IEC 870-5-104 (TCP/IP) telecontrol protocols is shown below.

Redundant configuration with AS 412H/AS 414H/AS 417H and IEC 870-5-101 telecontrol protocol (serial)

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

- 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.

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 an automation system, 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>6AG6 003-0BA01-0AA0</td>
</tr>
<tr>
<td>Note: Software activation by phone</td>
<td>6AG6 003-0BB11-0AA0</td>
</tr>
</tbody>
</table>

- for AS single station, IEC 870-5-101 protocol
  Function block library for S7-400, CP 441 interface

- for AS redundancy station, IEC 870-5-101 protocol
  Function block library for S7-300/S7-400H, CP 340/341 interface

- for IEC 870-5-104 protocol
  Function block library for S7-400/S7-400H, CP 443-1 interface
Redundant configuration with AS 412H/AS 414H/AS 417H and 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.

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. For the contact address for a quotation and consulting, refer to “Further information”.

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SINAUT ST7 is a telecontrol system based on SIMATIC S7 (S7-300, S7-400, C7 control system 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 (available soon)**

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 and SIMATIC PCS 7 V7.
**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 modern 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 IWL 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 IK 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**
  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 periods 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 TCP/IP-based WAN

- **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:

http://www.siemens.com/sinaut
### Operator control and monitoring

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<thead>
<tr>
<th>Page</th>
<th>Description</th>
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<td>OPD: Operator dialog with electronic signatures</td>
</tr>
<tr>
<td>5/3</td>
<td>Alarm Control Center: Signaling of faults by means of telecommunication</td>
</tr>
<tr>
<td>5/4</td>
<td>Premium Server for SIMATIC PCS 7</td>
</tr>
<tr>
<td>5/6</td>
<td>Projection systems for screens in control centers</td>
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<tr>
<td>5/8</td>
<td>DVIVision/CATVision/LwLVision: Operator channel extensions</td>
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<td>5/9</td>
<td>Acxos: Server administration over IP</td>
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<td>5/10</td>
<td>SIVICON: Video web server for process monitoring</td>
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<td>5/12</td>
<td>Visor: Video technology for process monitoring</td>
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<tr>
<td>5/13</td>
<td>CHALLENGER: PC terminals for hazardous areas</td>
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<td>5/14</td>
<td>IPC-EX: PC operator control units for hazardous areas</td>
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<td>5/15</td>
<td>Mouse-Trak: Trackball</td>
</tr>
<tr>
<td>5/16</td>
<td>Siemens Fingerprint Mouse</td>
</tr>
<tr>
<td>5/17</td>
<td>Operator’s ToolSet</td>
</tr>
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</table>
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 V5, 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 AB
17195 Solna, Sweden
E-mail: info@plantsolutions.se

Additional information is available in the Internet under:
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.

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
  - Pager
  - E-mail
  - Digital telephone system such as Siemens HiPath/Hicom
  - LAN message
  - 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

Note:
The Alarm Control Center can operate together with SIMATIC PCS 7 V5, V6 and V7.

Selection and Ordering Data

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>Alarm Control Center &quot;Basic Edition&quot;</td>
<td>9AE4 310-3BS01</td>
</tr>
<tr>
<td>Core system for local installation on a SIMATIC PCS 7 station</td>
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</tr>
<tr>
<td>Alarm Control Center &quot;Professional Edition&quot;</td>
<td>9AE4 310-3BS02</td>
</tr>
<tr>
<td>Core system for connection of several (max. 5) SIMATIC PCS 7 stations (also redundant systems)</td>
<td></td>
</tr>
<tr>
<td>Alarm Control Center &quot;Enterprise Edition&quot;</td>
<td>9AE4 310-3BS03</td>
</tr>
<tr>
<td>Core system for connection of several (more than 5) SIMATIC PCS 7 stations (also redundant systems)</td>
<td></td>
</tr>
<tr>
<td>PCS 7 Agent for Alarm Control Center</td>
<td>9AE4 310-3PW02</td>
</tr>
<tr>
<td>Connection of a (further) SIMATIC PCS 7 system to the Alarm Control Center via LAN (one license already included with each core system)</td>
<td></td>
</tr>
<tr>
<td>Alarm Control Center transmitter channel &quot;SMS via GSM modem, dual-band&quot;</td>
<td>9AE4 310-3FG10</td>
</tr>
<tr>
<td>For direct sending of text messages in the GSM network with acknowledgment function (including dual-band hardware for use in Europe)</td>
<td></td>
</tr>
<tr>
<td>Alarm Control Center transmitter channel &quot;SMS via GSM modem, quad-band&quot;</td>
<td>9AE4 310-3FG12</td>
</tr>
<tr>
<td>For direct sending of text messages in the GSM network with acknowledgment function (including quad-band hardware for global use)</td>
<td></td>
</tr>
<tr>
<td>Alarm Control Center transmitter channel &quot;Voice output&quot;</td>
<td>9AE4 310-3FV10</td>
</tr>
<tr>
<td>Voice output (WAV files) to any phone, requires ISDN card</td>
<td></td>
</tr>
<tr>
<td>Alarm Control Center transmitter channel &quot;E-mail&quot;</td>
<td>9AE4 310-3FE10</td>
</tr>
<tr>
<td>Sending of e-mail via SMTP server</td>
<td></td>
</tr>
</tbody>
</table>

D) Subject to export regulations: AL: N, ECCN: 5D992B1

Notes:
The Alarm Control Center can be used together with SIMATIC PCS 7 V5, V6 and V7.
Information on further configurations and options can be obtained from the Internet address specified.

More information

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

Additional information is available in the Internet under:
http://www.siemens.de/alarmcc
In addition to the basic hardware offered in the Catalog ST PCS 7, we offer you the innovative Premium Server for SIMATIC PCS 7 - an attractive, powerful and flexible system for the upper performance range of the SIMATIC PCS 7 process control system V7.0 and higher.

The Premium Server can not only be used as an OS server, but also as an archive, batch or route control server, etc. The compatibility with the SIMATIC PCS 7 process control system has been proven in extensive tests.

Benefits
- High performance
- Flexible expansion options
- Control of complex archiving tasks (e.g. due to large quantities of signals)
- High data availability due to fast, failsafe RAID1 system as well as other redundant components
- SIMATIC PCS 7 conformity minimizes project risks and commissioning costs
- The restore DVD supplied enables the original configuration to be quickly restored in the event of a failure

Design
The Premium Server is a professional and reliable workgroup server with two quad-core Intel Xeon processors, built into a 19" rack housing of 4 height units (HU). The preinstalled Microsoft Windows Server 2003 operating system + SP2 is tailored to the requirements of the current SIMATIC PCS 7 V7.0 software.

The CP 1623 interface module is required instead of the CP 1613 A2 interface module to connect the Premium Server to the Industrial Ethernet plant bus. The CP 1623 with a PCI Express x1 interface can be plugged into all PCI Express slots, and can be operated as a component of the Premium Server with SIMATIC PCS 7 V7.0 (SP1 and higher). It can be ordered from catalog IK PI or ST PCS 7.

The driver software required for integration of the CP 1623 into SIMATIC PCS 7 V7.0 is available from Industry Automation and Drive Technologies for downloading from the Internet portal Service & Support:

Additional information is available in the Internet under:
## Selection and Ordering Data

<table>
<thead>
<tr>
<th>Premium Server for SIMATIC PCS 7</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack housing 4 HU</td>
<td>9AE4 510-2PC54</td>
</tr>
<tr>
<td>2 x Xeon DP Quad Core E5430</td>
<td></td>
</tr>
<tr>
<td>2.66 GHz</td>
<td></td>
</tr>
<tr>
<td>4 GB RAM</td>
<td></td>
</tr>
<tr>
<td>73 GB RAID1-SAS hard disk drive</td>
<td></td>
</tr>
<tr>
<td>2 x 10/100/1000-TP-LAN</td>
<td></td>
</tr>
<tr>
<td>Redundant power supply/fan</td>
<td></td>
</tr>
<tr>
<td>Windows Server 2003 MUI SP2</td>
<td></td>
</tr>
<tr>
<td>operating system, 5 CALs</td>
<td></td>
</tr>
</tbody>
</table>

D) Subject to export regulations: AL: N, ECCN: 5D992B1

## More information

Siemens AG  
Industry Sector  
Karlsruhe  
Phone: +49 (721) 595-4622 or 4273  
Fax: +49 (721) 595-4624  
E-mail: pcs7-premiumserver.industry@siemens.com
Overview

The full specification of a control center includes recommendations relating to screen, image encoder technology, installation, lighting, air conditioning and software. 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.

Barco Control Rooms is a dependable partner for the customized equipping of control centers with projection systems for display walls. Barco Control Rooms attaches particular importance to the appropriate balance between functional, ergonomic and economic aspects.

The solutions devised offer a pleasant and functional working atmosphere and are representative of the system both within the company and to customers and visitors.

Note:
Projection systems from Barco Control Rooms can be used together with SIMATIC PCS 7 V5, V6 and V7.

Function

The many years of experience of Barco Control Rooms in the development of back-projection systems and their control is reflected in the comprehensive range of products, based on the latest technologies and standardized interfaces.

The range of projection screens comprises the following standard products:

<table>
<thead>
<tr>
<th>Projection system</th>
<th>Screen diagonal</th>
<th>Technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>OverView D2 series</td>
<td>50&quot;, 70&quot;, 80&quot;</td>
<td>Single-chip DLP technology</td>
</tr>
</tbody>
</table>
| OV 508, 708, 808  | Type x08 = XGA resolution (1024 x 768 pixels)  
| OV 513, 713, 813  | Type x13 = SXGA resolution (1280 x 1024 pixels)  
| OV 515, 715, 815  | Type x15 = SXGA+ resolution (1400 x 1050 pixels)  
|                   | 16.7 million colors, double-lamp system, automatic brightness and color adjustment  
|                   | Redundant digital interface (DVI-D)² and web-based service interface |
| OverView fDG and fDR+ | 70" | Single-chip DLP technology  
| Resolution: XGA (1024 x 768 pixels) or SXGA+ (1400 x 1050 pixels)  
| 16.7 million colors, double-lamp system  
| Redundant digital interface (DVI-D)²  
| Front access, small space requirements |
| OverView D1 series | 50", 67", 80" | Single-chip DLP technology  
| Resolution: XGA (1024 x 768 pixels), SXGA (1280 x 1024 pixels) or SXGA+ (1400 x 1050 pixels)  
| 16.7 million colors, double-lamp system, automatic brightness adjustment  
| Dual digital interface (DVI-D)² |

1) Customized systems with screen diagonals up to 120" can also be implemented
2) A multi-input interface with signal scaling, analog interface (VGA) and video interface is available as an option.
All projection systems have a modular structure and can be combined to create projection screens of any size. The projection screen forms one very large monitor on which all the information can be displayed and moved independently of the individual screens. The screen elements offer excellent brightness and contrast and guarantee sharp, distortion-free pictures.

All projection systems offer 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 Barco Control Rooms projection systems are designed for 24/7 operation. Simple maintenance facilities (e.g. pre-adjusted lamp module) and new double lamp systems guarantee a high level of availability and enable the image to be displayed continuously even in the event of a lamp failure. Automatic brightness and color adjustment (for all OverView modules of a large projection screen) guarantees a uniform and ergonomic image quality.

More information

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Singapore
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Japan
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Additional information is available in the Internet under:
http://www.barcocontrolrooms.com
Operator control and monitoring

DVIVision/CATVision/LwLVision: Operator channel extensions

Overview

The DVIVision, CATVision and LwLVision operating channel extensions (Keyboard Video Mouse Extender) from Guntermann & Drunck can be used in SIMATIC PCS 7 projects for the physical separation of computers and operator terminals over distances of up to 10,000 m.

- **DVIVision** transmits the keyboard, digital video, mouse and USB (transparent) computer signals via CAT cable (CAT5e classification and higher) over distances of up to 140 m.
- **CATVision** transmits the keyboard, analog video (also multiple), mouse, RS 232, audio and USB 1.1 (transparent) computer signals over distances of up to 300 m depending on the resolution, or up to 100 m with the USB option. CAT5, CAT6 or CAT7 cables can be used as the transmission medium.
- **LwLVision** transmits the keyboard, analog/digital video (also multiple), mouse, RS 232, audio and USB 1.1 (transparent) computer signals via fiber-optic cable over distances of up to 10,000 m, or up to 2,000 m for the USB 1.1 signals.

**Note:**

DVIVision, CATVision and LwLVision can be used together with SIMATIC PCS 7 V6 and V7.

Application

With the aid of the DVIVision, CATVision and LwLVision operating channel extensions, 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

DVIVision, CATVision and LwLVision each consist of one transmitter unit and one receiver unit which are available in desktop and 19” design and which are connected to one another by means of a CAT cable (5/6/7) or via a fiber-optic cable. They are independent of the system platform and the operating system. An operator terminal can be used with each transmitter and receiver.

The standard interfaces are used for the computer connection. Neither software installation nor computer setting operations are necessary. The multi-channel versions transmit up to 3 video signals with the DVIVision, up to 4 video signals with the CATVision, and up to 2 video signals with the LwLVision. This is particularly important for multi-video operation with up to 4 process monitors.

By means of an KVM switch, local maintenance by an administrator can be centralized in the control room.

More information

Guntermann & Drunck GmbH
see page 5/9

### Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>DVIVision</th>
<th>CATVision</th>
<th>LwLVision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum transmission distance in m</td>
<td>140</td>
<td>300 (depending on resolution)</td>
<td>550/10,000</td>
</tr>
<tr>
<td>Transmittable signals</td>
<td>Keyboard, video, mouse</td>
<td>Keyboard, video, mouse</td>
<td>Keyboard, video, mouse, audio (CD quality), RS 232</td>
</tr>
<tr>
<td>Optional signals</td>
<td>RS 232/audio and USB 1.1</td>
<td>RS 232, audio (CD quality) and USB 1.1</td>
<td>USB 1.1</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>
</tr>
<tr>
<td>Video format</td>
<td>Digital</td>
<td>Analog</td>
<td>Analog and digital</td>
</tr>
<tr>
<td>• Input</td>
<td>Digital/analogue</td>
<td>Analog</td>
<td>Analog and digital</td>
</tr>
<tr>
<td>Maximum video resolution</td>
<td>1920 x 1200 at 60 Hz</td>
<td>1920 x 1440 at 75 Hz (depending on distance)</td>
<td>1280 x 1024 at 75 Hz, 1600 x 1200 at 60 Hz</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>
</tr>
<tr>
<td>Length compensation</td>
<td>Not necessary</td>
<td>IVT (video gain adjustable)</td>
<td>Not necessary</td>
</tr>
<tr>
<td>Cable compensation</td>
<td>Not necessary</td>
<td>IVT (cable types variable)</td>
<td>Special devices for each type of fiber</td>
</tr>
<tr>
<td>Delay compensation (optional)</td>
<td>Not necessary</td>
<td>IVT (color runtimes adjustable)</td>
<td>Not necessary</td>
</tr>
<tr>
<td>Automatic screen size adaptation</td>
<td>Not applicable</td>
<td>Not necessary</td>
<td>Automatic video scaling</td>
</tr>
<tr>
<td>Automatic video optimization</td>
<td>Not applicable</td>
<td>Automatic video adjustment</td>
<td>Automatic video adjustment</td>
</tr>
<tr>
<td>Expandability</td>
<td>With KVM switch</td>
<td>With KVM switch</td>
<td>With KVM switch</td>
</tr>
</tbody>
</table>
Overview

With a combination of KVM-IP extender Acxos and KVM switch (ControlCenter 4/n), an administrator is able to access his plant’s servers locally and/or remotely. Access to the target server can be carried out down to the BIOS level. It is independent of the operating system and its status. If the network fails, the servers can still be accessed via ISDN.

Note:
The server administration over IP with use of Acxos is possible together with SIMATIC PCS 7 V6 and V7.

Application

As a result of the server administration over IP, you are able to optimize your servicing operations and minimize server downtimes. A service employee/administrator becomes quasi location-independent since he can access the plant servers from any LAN/WAN port using his servicing computer.

Design

The server administration over IP is based on a KVM switch (ControlCenter 4/n) and the KVM-IP extender Acxos. The servers are connected to the ControlCenter 4/n which, because of its modular design, can be individually configured and expanded. Administration is carried out using local and/or remote operator stations/servicing computers. At distances up to 200 m it is possible to access the connected servers 1:1 using a transceiver system for transmission via CAT cables. For unlimited access via IP, Acxos digitizes the KVM data of the servers and displays their desktop in an application window on the service computer connected to the LAN/WAN. The KVM-IP extender Acxos transmits the KVM signals with an 8-bit color depth with almost 1:1 performance.

Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>ControlCenter 4/n</th>
<th>Acxos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of consoles/operator stations</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Number of servers</td>
<td>12 (basic unit)</td>
<td>1 or 12 with ControlCenter 4/n</td>
</tr>
<tr>
<td>Video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Standard VGA interface</td>
<td>VGA (R, G, B, H, V)</td>
</tr>
<tr>
<td>Resolution</td>
<td>1600 x 1200 at 85 Hz</td>
<td>1280 x 1024 at 75 Hz</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>Up to 250 MHz</td>
<td>140 MHz</td>
</tr>
<tr>
<td>Maximum pixel frequency</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>H/V sync</td>
<td>110 kHz/120 Hz</td>
<td>-</td>
</tr>
<tr>
<td>Color depth</td>
<td>-</td>
<td>8 bit</td>
</tr>
<tr>
<td>Communication</td>
<td>1:1 connection, transceiver</td>
<td>TCP/IP over Ethernet 10/100 Mbit/s or ISDN</td>
</tr>
<tr>
<td>Access protection</td>
<td>Password</td>
<td>Password, SSL encryption 128 bit, user and access privilege administration</td>
</tr>
<tr>
<td>Design</td>
<td>3 HU; desktop or rack</td>
<td>1 HU; rack</td>
</tr>
</tbody>
</table>

More information

Guntermann & Drunck GmbH
Systementwicklung
Dortmunder Str. 4a
57234 Wilnsdorf
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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:
http://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 results in new, user-friendly and low-maintenance solutions for the visual monitoring of objects.

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

**Note:**
SIVICON can be used together with SIMATIC PCS 7 V5, 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 1, 2, 4, 6, 8 and 16 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 SIMATIC PCS 7 by means of ActiveX Controls. There is one ActiveX Control for displaying video images and one for controlling the cameras. Events that have been recorded by the video web server can also be forwarded to the SIMATIC PCS 7 signaling system by means of an additional application.
Operator control and monitoring

SIVICON: Video web server for process monitoring

Selection and Ordering Data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AC9 311-1AA00</td>
<td>V100 A without hard disk, with LAN and ISDN</td>
</tr>
<tr>
<td>9AC9 311-1AA01</td>
<td>V100 A without hard disk, LAN</td>
</tr>
<tr>
<td>9AC9 311-2AA00</td>
<td>V200 A without hard disk, with LAN and ISDN</td>
</tr>
<tr>
<td>9AC9 311-2AA01</td>
<td>V200 A without hard disk, LAN</td>
</tr>
<tr>
<td>9AC9 311-4AA20</td>
<td>V400+19&quot; without hard disk, with LAN</td>
</tr>
<tr>
<td>9AC9 311-4AA30</td>
<td>V410+19&quot; with 160 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-4AA31</td>
<td>V410+19&quot; with 300 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-6AA20</td>
<td>V600+19&quot; without hard disk, with LAN</td>
</tr>
<tr>
<td>9AC9 311-6AA30</td>
<td>V610+19&quot; with 160 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-6AA31</td>
<td>V610+19&quot; with 300 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-4AA80</td>
<td>V800 with 160 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-4AAA60</td>
<td>V1600 with 160 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-4AAA41</td>
<td>V4000 without hard disk, with LAN</td>
</tr>
<tr>
<td>9AC9 311-4AAA40</td>
<td>V4000 with 160 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-4AAA43</td>
<td>V4000 with 300 GB hard disk and LAN</td>
</tr>
<tr>
<td>9AC9 311-4AAA51</td>
<td>V4000 hybrid (4 analog/4 digital) without hard disk</td>
</tr>
<tr>
<td>9AC9 311-4AAA50</td>
<td>V4000 hybrid (4 analog/4 digital) with 160 GB hard disk</td>
</tr>
<tr>
<td>9AC9 311-4AAA53</td>
<td>V4000 hybrid (4 analog/4 digital) with 300 GB hard disk</td>
</tr>
</tbody>
</table>

Updates

Upgrade from V4xx to V6xx

Software

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AC9 311-0AA00</td>
<td>ActiveX Control for incorporation of live videos into SIMATIC PCS 7</td>
</tr>
</tbody>
</table>

One license required per PCS 7 server

Service

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

Documentation

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

More information

Siemens AG
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Niederlassung Ruhr
Essen
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E-mail: Klaus.kollenberg@siemens.com
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 V5, 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.

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.

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.

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.

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. The VisorX software tool can be used to directly integrate video signals from web cameras into the SIMATIC PCS 7 process control system.

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.

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.

More information
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76646 Bruchsal
Germany
Phone: +49 7251 93259-0
Fax: +49 7251 93259-99
E-mail: vertrieb@ase-ag.eu

Additional information is available in the Internet under:
http://www.ase-ag.com
Operator control and monitoring

CHALLENGER: PC terminals for hazardous areas

Overview

Modular PC terminals for industrial production sites and hazardous areas: Zones 1, 2 and 22

The intrinsically-safe CHALLENGER PC terminals have been specially developed for the extreme conditions encountered in the chemical, oil and gas industries, and simultaneously meet the highest demands of the pharmaceutical industry (GAMP, GMP, etc.).

Commercially-available connection cables between PC and transmitter unit (TCV2i) as well as the further CAT 7 cable to the CHALLENGER terminal ensure minimum installation overhead at very low cost.

Each 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.

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

Function

Ex approval

- II 2G / II 3D, EEx ib IIC T4

International certificates

- 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. P0CC DE.TB04.B00176, EEx ib IIC T4
- TII
- 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
- Maximum brightness 650 cd/m²
- 15"/19" 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

- Barcode scanner / radio barcode scanner
- 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

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Additional information is available in the Internet under:
http://www.gecma.com

Design

Enclosure and mounting

- Ergonomic, industrial-design FHP enclosure (without dirt-catching edges)
- Simple mounting options for floor, wall, ceiling
- Customized special enclosure on request
iPC-EX: PC operator control units for hazardous areas

Overview

PCS 7 Add-on fit for SIMATIC PCS 7 V7

PC control unit for hazardous areas according to Category II 2G (Zones 1+2) and II 3D (Zone 22)

The iPC-Ex PC control units offered in various formats are designed especially for use in hazardous areas. They can be connected to a SIMATIC PCS 7 operator station by means of a line driver unit in the safe area. When using two-core fiber-optic cables, distances of up to 1000 m are possible between operator station and iPC-EX control unit.

Note: iPC-EX PC control units can be used together with SIMATIC PCS 7 V5, V6 and V7.

Function

The PC control unit for hazardous areas has the following Ex approvals:
- II 2 G, II 3 D
- EEx qe[ib] IIC T4
- IBEExU 01 ATEX 1099

The control unit offers IP65 protection at the front and can be equipped with various displays:
- 15" TFT color display with a resolution of 1024 x 768, optionally as a touch screen
- 18.1" TFT color display with a resolution of 1280 x 1024, optionally as a touch screen

The following supply voltages are available:
- 24 V DC at max. 2 to 3.5 A or
- 100 to 240 V AC at max. 0.4 to 0.7 A

All resolutions between 640 x 480 (VGA) und 1600 x 1200 (UXGA) can be displayed full-screen using iPC-Ex control units. For operating the operator station from the hazardous area, an intrinsically-safe membrane keyboard with optional intrinsically-safe trackball or intrinsically-safe touchpad with IP65 protection (trackball only in idle position) is integrated. The numerous I/O devices available as options - such as barcode readers in wireless or cable design, video camera input, Ex identification system and Ex camera - allow a wide range of customized solutions.

Design

Designs

The operator control unit is available in various designs which offer a variety of installation options:
- iPC-EX REX for panel mounting
- iPC-EX LETO flat high-grade steel housing with vertical keyboard
- iPC-EX FERA pharmaceutical-standard high-grade steel housing with angled keyboard
- iPC-EX AXENA high-grade steel housing with tilting display and angled keyboard
- iPC-EX ORTRA as attractive command station (column)

More information

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Operator control and monitoring

Mouse-Trak: Trackball

Overview

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

Note:
Mouse-Trak Professional and Mouse-Trak Industrial are compatible with SIMATIC PCS 7 V5, V6 and V7.

Design

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

More information

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http://www.chameleon-group.com
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.

### Selection and Ordering Data

<table>
<thead>
<tr>
<th>Siemens Fingerprint Mouse with USB connection and driver software for SIMATIC Logon, for SIMATIC PCS 7 V6 and V7</th>
<th>Order No.</th>
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<td>9AE4 100-4DM04</td>
<td>C)</td>
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</table>

C) Subject to export regulations: AL: N, ECCN: EAR99S
The Operator’s ToolSet (OTS) is a collection of practical tools to increase the efficiency during commissioning, operation, maintenance and documentation of plants based on the SIMATIC PCS 7 process control system.

The products included in the OTS, such as OTS suite, OTS shift log and OTS document management system, can be used individually or combined, and are characterized by the following features:

- Redundant design possible
- Modular
- Scalable
- Flexible
- Adaptable

Development of the OTS was based on many years’ practical experience gained from numerous customer projects in various industries, and considers the demands and requirements of many owners of process engineering plants. During the continuous further development, great importance was placed on intensive exchange with plant owners - also the reason for initialization of development of the Operator’s ToolSet.

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

The matched tools of the Operator’s ToolSet work together perfectly. The specific provision of comprehensive, application-specific information provides plant owners with decisive advantages:

- Improved information quality and access to information allow qualified, early decision-making at every level within a company
- Faster and better detection and solving of problems
- Fewer failures and shorter downtimes
- Increase in efficiency
- Provision of support for statutory environment, e.g. FDA
- Improved quality assurance
- Less paperwork

Function

**OTS suite**
The OTS suite includes the following components:

- Object information system
- Object finder
- Trend collector "Drag & Drop"
- Trend control
- Printer setting tool

**Object information system**
Dynamic process objects (e.g. pumps, motors, valves, measuring points) as well as static process objects (e.g. tanks, manually actuated valves, units relevant to monitoring) can be assigned notes, messages or data directly in the process display. Saved information can be called for the info object (next to the process object) by clicking with the mouse. Thus all important information is available at the position where it is relevant. Saved information on individual objects is signaled in the SIMATIC PCS 7 group display and in the process display. Analogous to the loop-in-alarm function, the operator is guided directly from the group display to the object.

Function overview:

- Saving of information if freely-definable categories, e.g.
  - Technical specifications
  - Maintenance information
  - Fault information
- Historical display of entries with user name and time stamp

The object information system is linked to the trend control and the trend collector "Drag & Drop". If an OTS shift log is installed in addition, the shift log entries are automatically matched to corresponding entries on the process objects.

**Object finder**
The object finder allows simple searching for objects and measuring points in the control system. Following input of a search text, e.g. process variable, plant identifier or plain text, a list of hits is output. A particular object can be selected simply by clicking there.

Function overview:

- Searching for objects and measuring points throughout the project
- Fast overview of searched objects
- Detailed information when selecting individual objects
- Changing to process image of a selected object by clicking with mouse
- Selected objects can be added to trend groups and displayed, or added to the trend collector "Drag & Drop"
- Export of result list for documentation updating in HTML or CSV format

**Trend collector "Drag & Drop"**
The trend collector allows measuring point values to be selected conveniently by clicking with the mouse in order to display them as a trend group in the trend control. No knowledge whatsoever of the SIMATIC PCS 7 system is required.

Function overview:

- Collection from up to 10 measuring points
- Creation of measuring point list as new trend group, and display in trend control
- Removal of individual entries from the measuring point list
Trend control

The trend control is used for simple display and management of trend groups. Groups are easy to produce using the trend collector or object finder. The settings of the measuring point, e.g. name or measuring unit, are imported at the same time, and automatically output in the trend display. The trend group created as well as all settings can be directly assigned to a plant area.

Function overview:
- Display of up to 10 trends
- Simple parameterization of trend groups using the mouse
- Saving of trend groups directly in the levels of the technological hierarchy (also from the Web)
- Display of current values for individual trends
- Printing of current view
- Fast configuration of time axis and measuring trend
- Calendar function for fast calling of archived values

Printer setting tool

It is frequently impossible for operators to carry out settings on the printers installed in the system while process control is ongoing. One of the functions provided by the printer setting tool is to allow modification of the standard printer and its settings.

OTS shift log

Weekly view of the OTS shift log

Many factors must interact to allow trouble-free operation of plants. In addition to process values, messages and alarms from the control system, operators must record dozens of events, measures and tests every day. The clearly structured, electronic OTS shift log allows colleagues to obtain information on all events simply and rapidly, or to delegate and track tasks – even without the SIMATIC PCS 7 station. The handwritten entries usually made in shift logs become unnecessary. The recording and management of all information and instructions is carried out for all shifts together and throughout the company. Certain data, e.g. time stamp or user, is added automatically.

The availability of plants can be compared using clear daily or weekly reports in which the shift log entries are presented in structured form. The OTS shift log can also serve as a knowledge memory, e.g. for troubleshooting or for further optimization of working procedures. It of course also complies with statutory requirements and conditions such as the 21 CFR Part 11 regulation of the FDA and M260.

Scope of functions of the OTS shift log:
- Creation of entries and subsequent entries which can be directly assigned to objects and areas
- Status management of the entries
- List, daily, detailed, weekly, monthly and annual views
- Filter and search function
- Printing of selected reports
- Export of selected reports as CSV or HTML file
OTS document management system

Main window of the OTS document management system

The process-specific OTS document management system (OTS-DMS) offers a solution for management of all types of document in their original format. It permits easy finding and organization of documents in electronic form. Documents are made available rapidly and reliably for every station in the network through application of central document servers.

A contact and keyword management function supports users in the overview, the internal user management function provides protection against unauthorized access, and the integral version management function guarantees that changes in the documents remained comprehensible. Assignments can be made to process objects using the HMI link, and documents linked in this manner can be opened directly from the SIMATIC PCS 7 process display.

Scope of functions of the OTS DMS:
- Management of documents in original format
- Storage of documents in freely-definable categories (directories/folders)
- 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 to:
  - Keywords
  - Tasks
  - Contacts
  - Notes
  - Process objects
- Documents linked to process objects can be opened directly from the process display
- User privilege system for access to documents
- Version management

Technical specifications

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

Process control system
- SIMATIC PCS 7 V6 or V7

More information
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Fax: +49 461 50 54 87-100
E-mail: info@operators-toolset.com

Additional information is available in the Internet under:
hhttp://www.operators-toolset.com
Operator control and monitoring
| 6/2 | MFL: Modular PCS 7 function block library for technological functions |
| 6/3 | PTE400: PCS 7 function block library for technological functions |
| 6/4 | SC library: 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 | SIMATIC PCS 7 powerrate: Power data evaluation and energy management |
Overview

"MFL" is a modular function block library for the SIMATIC PCS 7 process control system V5.2, V6 and V7. This library enables the maximum performance to be obtained from SIMATIC PCS 7 and allows flexible response to specific technological demands.

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

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.

Since 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, e.g. 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

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

Multiple views

Blocks may occur several times within one process tag, e.g. 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.

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

More information

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Controlmatic
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E-mail: pcs7.mfl@actemium.de

Additional information is available in the Internet under:
http://www.actemium.de
Overview

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

With the PTE400 function block library of SIMATIC PCS 7, you receive a collection of tried and tested technological function blocks for rational and cost-effective generation of SIMATIC PCS 7 user software for process automation and visualization. These blocks have a high level of standardization, cover a wide range of functions, and meet the requirements of virtually every industry, e.g. chemical, pharmaceutical, food, beverages and tobacco, oil and gas, water supply and treatment, and 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.

The PTE400 function block library can be ordered for SIMATIC PCS 7 V6.0, V6.1 and V7.0, and is also kept updated for these versions.

Function

The PTE400 library offers blocks for the following functions:
- Analog value monitoring
- PID control
- Analog actuators
- Motor block with 1 control
- Motor with 2 directions of rotation
- Motor with 2 speeds
- Motor for speed-controlled drives
- Motor slide
- Control module for open/close valves
- Control module for multiway valves
- Proportioning block with coarse/fine flow
- Interlocking module
- Binary value monitoring
- Step controller function
- Fast shutdown for drives
- Motor slide with analog position feedback
- Binary value operation 1-from-8 and 1-from-32

PTE400: PCS 7 function block library for technological functions

- 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

Order No.
PTE400 V6.1 – process technology elements for SIMATIC PCS 7 V6.1/V7.0
Function block library for SIMATIC PCS 7 V6.1/V7.0, function blocks and operating screens as well as electronic documentation on CD-ROM, Single License for use on an AS 414, AS 416 or AS 417 automation system
- Engineering license for one project (including a runtime license)
- Runtime license for one automation system
- Upgrade PTE400 to V6.1/V7.0 (project license)
  9AE4 200-8GB00-0DD0
  9AE4 200-2GB10-1DD0
  9AE4 200-8GB04-0BD0

PTE400 V6.0 – process technology elements for SIMATIC PCS 7 V6.0
Function block library for SIMATIC PCS 7 V6.0, function blocks and operating screens as well as electronic documentation on CD-ROM, Single License for use on an AS 414, AS 416 or AS 417 automation system
- Engineering license for one project (including a runtime license)
- Runtime license for one automation system
- Upgrade PTE400 to V6.0 (project license)
  9AE4 200-8FB00-0CC0
  9AE4 200-2FB10-1CC0
  9AE4 200-8FB04-0BC0

More information

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SC library: PCS 7 function block library for technological functions

Overview

The Standard Chemical library is a function block library for the SIMATIC PCS 7 process control system, which can be used in process engineering across all sectors. This library enables you to perform a wide variety of automation tasks very effectively, while at the same time reducing the engineering overhead and thus the configuration costs. The SC library has already been successfully used in more than 240 plants.

The SC library is integrated into the system environment of SIMATIC PCS 7. It contains function blocks for CFCs, OS faceplates, OS block icons (user objects) and configuration wizards.

An operating and signaling behavior with plant-specific selectable or deselectable block functions is implemented in the function blocks which are suitable for both continuous and batch processes. Function blocks which control units such as motors or valves have the “on-site operation” mode in addition to the automatic and manual modes. This enables units to be operated directly “on site” and displayed in the process control system.

In the case of blocking signals, a distinction is made in the function blocks between interlocking, operating condition and switch-on release.

All function blocks with the automatic operating mode also have the option of supporting a non-saving behavior for commands from the sequential function chart (SFC). A termination of the sequence control therefore results in the automatic deactivation of the units.

The faceplates are clearly designed, and all major block functions are integrated in the standard view. This ensures simple and safe operation of the plant. Faceplates are available in OCX and Faceplate Designer technologies.

The operator authorizations can be assigned specifically to the process tags; even recently assigned authorization levels in the WinCC User Administrator can be included.

For better arrangement of process tags or run sequences, it is possible to display comments relating to the process tags in the faceplates.

Siemens provides a manufacturer’s declaration for the SC library in which compliance with quality assurance measures according to DIN EN ISO 9001:2000 as well as the existence of a lifecycle model according to GAMP 4 for the product development are certified. A component of this important quality proof is also the grading of the SC library into the GAMP software categories.

Note:
The SC library can be used together with SIMATIC PCS 7 V5, V6 and V7.

Function

The SC library offers blocks for the following functions:
- Analog measured value monitoring
- Analog measured value monitoring with limit value pairs
- PID control
- Dosing
- Valve control
- Multiway valve
- Motor with 1 control signal
- Motor with 2 directions of rotation or speeds
- Motor for frequency converter
- Interlocking
- Binary input
- Binary operator unit
- Analog and binary operator unit
- Message block
- Counter block

Selection and Ordering Data

Selection and Ordering Data

Order No.

SC library
Function block library for SIMATIC PCS 7 V5.x, V6.x and V7.0; function blocks, OS faceplates, OS block icons and wizards as well as electronic documentation on CD-ROM; can be used on AS 414, AS 416, AS 417, AS 414H or AS 417H automation system; 2 languages (German, English)
- Runtime license (required for each AS system), contains block library and OS faceplates
- Engineering license (required for each ES workstation), contains OS block icons and wizards

More information

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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.

Function

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

The available objects are categorized as follows:
- General objects
  - Basic function blocks
  - Arithmetic function blocks
  - Time switch programs
- Air conditioning technology
  - Signaling blocks
  - Control units
  - Switching instructions
  - Positioning instructions
- Heating technology
  - Heat generators
  - Heat consumers
- Process simulation
  - Function blocks for simulation

Since the objects are provided in the form of modifiable CFCs, planning departments or engineering consultants can carry out application-specific modifications simply and cost-effectively. Complete application examples are provided together with the HVAC Library (e.g. air-conditioning system), and can be used for acquaintance purposes and to facilitate engineering.

Selection and Ordering Data

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<thead>
<tr>
<th>HVAC Library Toolset V3.0</th>
<th>Order No.</th>
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<td>for SIMATIC PCS 7 V6.0, V6.1 and V7.0</td>
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<td>Single License for 1 installation</td>
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<th>Order No.</th>
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<tbody>
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<td>Runtime license for one AS automation system</td>
<td></td>
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<tr>
<td>Single License for 1 installation</td>
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<td>6BQ2 001-0AB10-0AC0 (C)</td>
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<tr>
<th>HVAC Library V3.0</th>
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<tbody>
<tr>
<td>Runtime license for all AS automation systems of one HVAC project at one location</td>
<td>6BQ2 001-0AD10-0AC0 (C)</td>
</tr>
<tr>
<td>Floating License for 1 user</td>
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Selection and Ordering Data

Order No.

HVAC Library Toolset V3.0 for SIMATIC PCS 7 V6.0, V6.1 and V7.0
Single License for 1 installation

6BQ2 001-0AA10-0AC0 (C)

HVAC Library V3.0
Runtime license for one AS automation system
Single License for 1 installation

6BQ2 001-0AB10-0AC0 (C)

HVAC Library V3.0
Runtime license for all AS automation systems of one HVAC project at one location
Floating License for 1 user

6BQ2 001-0AD10-0AC0 (C)

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

More information

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Overview

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

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

The Partial Stroke Test (PST) is an excellent alternative in such a case. During this test, the freedom of movement of the valve is tested by partially opening and closing it, without interrupting the process. More than 50% of the possible valve faults can be detected in this manner. The valve stroke is usually 10 to 15%. The length of the partial stroke depends on the process conditions and on the diagnostics level required. The test is protected by a safety-related digital output (F-DO) as an alternative method to drive the valve to its safety position if necessary. Thus two separate emergency shutdown signals are present on the valve positioner (1oo2 redundancy).

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

Partial Stroke Tests extend the interval between Full Stroke Tests 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 and V7.0.
Function

Main components of the PST library include:

**PST Engineering Template**

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

**PST Operator Interface**

Faceplate for the SIMATIC PCS 7 operator system

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

**PST Report**

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

Selection and Ordering Data

<table>
<thead>
<tr>
<th>Order No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6BQ2 001-0CA11-0AA0</td>
<td>Partial Stroke Test (PST) with S7-400FH and SIMATIC PCS 7 (S7 F Lib V1.2) based on SIMATIC PCS 7 V6.1 SP1 or V7.0 and S7 F Lib V1.2 library Function blocks and faceplates, engineering license and runtime license for one AS One language (English) Type of delivery: Software on CD as well as Single Licenses for 1 installation (Engineering and Runtime)</td>
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<td>6BQ2 001-0CA12-0AA0</td>
<td>Partial Stroke Test (PST) with S7-400FH and SIMATIC PCS 7 (S7 F Lib V1.3) based on SIMATIC PCS 7 V6.1 SP1 or V7.0 and S7 F Lib V1.3 library Function blocks and faceplates, engineering license and runtime license for one AS One language (English) Type of delivery: Software on CD as well as Single Licenses for 1 installation (Engineering and Runtime)</td>
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<td>6BQ2 001-0CB11-0AA0</td>
<td>Partial Stroke Test (PST) with S7-400FH and SIMATIC PCS 7 V7.0 Runtime license for a further AS One language (English) Type of delivery: Single License for 1 installation</td>
</tr>
</tbody>
</table>

More information

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Fax: +49 911 750 9602
E-mail: add-on-support.aud@siemens.com
Overview

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, thus helping to effectively reduce energy costs. Monitoring of the supply limit agreed upon in the contract can protect you from unnecessarily high supply prices or penalties, and simultaneously allows efficient utilization of the defined supply limit.

Through complete integration into SIMATIC PCS 7, standard functionalities and interfaces of the process control system, e.g. to SIMATIC IT, can be used with SIMATIC PCS 7 powerrate without problem.

Note:

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

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

Supply limits agreed in a contract (usually the 15-minute mean supply value for current) must be observed, otherwise 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/alarms. Depending on the configuration, loads are also switched off directly in the event of an imminent limit violation. In order 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 faceplate.

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

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### Selection and Ordering Data

<table>
<thead>
<tr>
<th>Order No.</th>
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<tr>
<td>Single License Engineering and Single License Runtime for one AS station</td>
<td>3ZS2 785-1CC20-0YG0</td>
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<tr>
<td>Single License Runtime for one AS station</td>
<td>3ZS2 785-1CC20-6YH0</td>
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Note: A license is required for each automation system (AS)

### Upgrade SIMATIC PCS 7 powerrate V1.0 to V2.0

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<td>Single License Runtime for one AS station</td>
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Note: A license is required for each automation system (AS)

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

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### More Information

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Additional information is available in the Internet under:
http://www.siemens.com/powermanagementsystem
<table>
<thead>
<tr>
<th>Section</th>
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<tr>
<td>7/2</td>
<td>Function blocks for SIWAREX weighing modules</td>
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<td>7/3</td>
<td>Drive ES PCS 7: Function blocks for drives</td>
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<tr>
<td>7/5</td>
<td>PCS 7 SIMOCODE pro: Function block library for the motor management system</td>
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<tr>
<td>7/7</td>
<td>AddFEM: Redundant I/O module for fast response times</td>
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<tr>
<td>7/10</td>
<td>Field barrier &quot;-FB-Ex4.*&quot;: Intrinsically-safe distribution block</td>
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<tr>
<td>7/12</td>
<td>AirLINE Ex: Pneumatic block for integration into ET 200iSP</td>
</tr>
<tr>
<td>7/14</td>
<td>SIMATIC RF: RFID systems</td>
</tr>
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</table>
Distributed I/O on the PROFIBUS

Function blocks for SIWAREX weighing modules

Overview

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

For the SIMATIC PCS 7 process control system, Siemens offers configuration packages with function blocks for the SIWAREX U, SIWAREX M, 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/M/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/M/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/M/FTA/FTC weighing modules can be used together with SIMATIC PCS 7 V5.2, V6 and V7. The configuration packages for SIMATIC PCS 7 V6.0 and V6.1 also function with SIMATIC PCS 7 V7.0. Special configuration packages for SIMATIC PCS 7 V7 will be available soon.

Selection and Ordering Data

<table>
<thead>
<tr>
<th>SIWAREX M configuration package</th>
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<tr>
<td>consisting of: Function block, faceplate, parameterizing software and manual on CD-ROM, 2 languages (German, English), engineering license for SIWAREX M</td>
<td>7MH4 583-3EA63</td>
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<tr>
<td>• For SIMATIC PCS 7 V5.2</td>
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<td>• For SIMATIC PCS 7 V6.0 and V6.1</td>
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<tr>
<th>SIWAREX U configuration package</th>
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<td>• For SIMATIC PCS 7 V6.0 and V6.1</td>
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<tr>
<th>SIWAREX FTA configuration package for SIMATIC PCS 7 V6.0 and V6.1</th>
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<td>consisting of: Function block, faceplate, parameterizing software and manual on CD-ROM, 2 languages (German, English), engineering license for SIWAREX FTA</td>
<td>7MH4 900-2AK61</td>
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<tr>
<th>SIWAREX FTC configuration package for SIMATIC PCS 7 V6.0 and V6.1</th>
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<tr>
<td>consisting of: Function block, faceplate, parameterizing software and manual on CD-ROM, 2 languages (German, English), engineering license for SIWAREX FTC</td>
<td>7MH4 900-3AK61</td>
</tr>
</tbody>
</table>

More information

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Distributed I/O on the PROFIBUS

Drive ES PCS 7: Function blocks for drives

**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 allow 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.

**Selection and Ordering Data**

<table>
<thead>
<tr>
<th>Drive ES PCS 7 for SIMATIC PCS 7 V7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Function blocks and faceplates for integration of SIMOVERT MASTERDRIVES, MICROMASTER, SIMOREG DC-MASTER, and SINAMICS S/G variable-speed drives into SIMATIC PCS 7 V7.0 (incl. SP1)</strong></td>
</tr>
<tr>
<td>CD-ROM with electronic documentation (5 languages)</td>
</tr>
<tr>
<td>Single License Engineering V7.0 incl. Single License Runtime for one AS station</td>
</tr>
<tr>
<td>Single License Engineering, upgrade from V6.x to V7.0 incl. Single License Runtime for one AS station</td>
</tr>
<tr>
<td>Single License Runtime V7.0 for one AS station</td>
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<td>Update service</td>
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Order No.

- 6SW1 700-7JD00-0AA0
- 6SW1 700-7JD00-0AA4
- 6SW1 700-5JD00-1AC0
- 6SW1 700-0JD00-0AB2

---

**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 V5.2, 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
- SINAMICS G120 (V6.1 + SP2 and higher)

**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.

**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.
### Drive ES PCS 7: Function blocks for drives

#### Selection and Ordering Data

<table>
<thead>
<tr>
<th>Drive ES Basic configuration software for SIMATIC PCS 7 V5.4</th>
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<tr>
<td>Software package for convenient parameter setting, commissioning and diagnostics of all Siemens drives as an option to STEP 7 V5.4</td>
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<th>Drive ES PCS 7 for SIMATIC PCS 7 V6.1</th>
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<tr>
<td>Function blocks and faceplates for integration of SIMOVERT MASTERDRIVES, MICROMASTER, SIMOREG DC-MASTER and SINAMICS S/G variable-speed drives into SIMATIC PCS 7 V6.1</td>
<td>6SW1 700-6JD00-0AA0</td>
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<td>CD-ROM with electronic documentation (5 languages)</td>
<td>6SW1 700-0JD00-0AB2</td>
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<tr>
<th>Drive ES Basic configuration software for SIMATIC PCS 7 V5.5</th>
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<tr>
<td>Software package for convenient parameter setting, commissioning and diagnostics of all Siemens drives as an option to STEP 7 V5.5</td>
<td>6SW1 700-5JA00-3AA0</td>
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<tr>
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<tr>
<td>Function blocks and faceplates for integration of SIMOVERT MASTERDRIVES, MICROMASTER, SIMOREG DC-MASTER, and SINAMICS S/G variable-speed drives into SIMATIC PCS 7 V6.0</td>
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<tr>
<td>CD-ROM with electronic documentation (5 languages)</td>
<td>6SW1 700-0JD00-0AB2</td>
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<table>
<thead>
<tr>
<th>Drive ES Basic configuration software for SIMATIC PCS 7 V5.6</th>
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<tbody>
<tr>
<td>Software package for convenient parameter setting, commissioning and diagnostics of all Siemens drives as an option to STEP 7 V5.6 with SP3 and later</td>
<td>6SW1 700-5JA00-3AA0</td>
</tr>
<tr>
<td>CD-ROM with electronic documentation (5 languages)</td>
<td>6SW1 700-0JA00-0AB2</td>
</tr>
</tbody>
</table>

#### More information

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Current product information, FAQs and manuals can also be found at Siemens Product Support under "Drive technology – (Engineering) Software – Drive ES"

Additional information is available in the Internet under:

http://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 V6.0, V6.1 or V7.0.

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 PCS 7 driver concept and minimizes the configuration requirements.

The library blocks are also used to integrate SIMOCODE pro into the asset management of SIMATIC PCS 7 V6.1/V7.0. There are no additional configuration requirements.

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 or V7.0 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. It is frequently used to automate processes where a plant standstill would be extremely costly. The detailed operating, servicing and diagnostics data provided by SIMOCODE pro allows you to efficiently prevent plant standstills, and you are able in the event of a fault to determine and eliminate the cause extremely rapidly.

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)
**PCS 7 SIMOCODE pro: Function block library for the motor management system**

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
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</tr>
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<tbody>
<tr>
<td><strong>SIMATIC PCS 7 block library SIMOCODE pro</strong>&lt;br&gt;AS blocks and faceplates for integration of SIMOCODE pro into SIMATIC PCS 7, 3 languages (German, English, French)&lt;br&gt;Engineering software for an engineering station, single license for 1 installation&lt;br&gt;AS Runtime software for an automation system, single license for 1 installation&lt;br&gt;Type of delivery: certificates of license, software and electronic documentation on CD</td>
<td>3UF7 982-0AA00-0 (D)</td>
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<tr>
<td>• V6.0 for SIMATIC PCS 7 V6.0</td>
<td>3UF7 982-0AA02-0 (D)</td>
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<td>• V6.1 for SIMATIC PCS 7 V6.1</td>
<td>3UF7 982-0AA10-0 (D)</td>
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<tr>
<td>• V7.0 for SIMATIC PCS 7 V7.0</td>
<td>3UF7 982-0AA13-0 (D)</td>
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<tr>
<td>• Upgrade from V6.0/V6.1 to V7.0</td>
<td>3UF7 982-0AA01-0</td>
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<td><strong>SIMATIC PCS 7 AS Runtime software SIMOCODE pro</strong>&lt;br&gt;For execution of AS blocks for SIMOCODE pro in an automation system, single license for 1 installation&lt;br&gt;Type of delivery: certificate of license</td>
<td>3UF7 982-0AA11-0 (D)</td>
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<tr>
<td>• V6.x for SIMATIC PCS 7 V6.0/V6.1</td>
<td>3UF7 982-0AA13-0</td>
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<td>• V7.x for SIMATIC PCS 7 V7.0</td>
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</table>

D) Subject to export regulations: AL: N, ECCN: 5D992B1

**More information**

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Additional information is available in the Internet under: [http://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 S7 design in terms of dimensions and shape, the AddFEM meets stringent environmental requirements. It is prepared for mounting on DIN rails and for direct mounting with bolts. These installation options support both freestanding construction and installation in cabinets or wall-mounted housings.

The connecting elements are protected by a removable hood on which the connector pin assignment of the peripheral signals is printed. The functions are set by means of two mode selectors and indicated by 12 LEDs. In accordance with the PLC standard, 2 x 16 LEDs are available in the display panel of the module for signaling the binary I/O signals.

Function

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.
## Distributed I/O on the PROFIBUS

### AddFEM: Redundant I/O module for fast response times

#### Technical specifications

<table>
<thead>
<tr>
<th>AddFEM/AddFEM SoE</th>
<th>AddFEM/AddFEM SoE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General data</strong></td>
<td><strong>Analog outputs (parameterizable)</strong></td>
</tr>
<tr>
<td>Dimensions (H x W x D) in mm</td>
<td>Outputs, total</td>
</tr>
<tr>
<td>295 x 75 x 209</td>
<td>0 ... 20 mA (500 Ω)</td>
</tr>
<tr>
<td>Weight</td>
<td>Current output range</td>
</tr>
<tr>
<td>2.8 kg</td>
<td>0 ... 20 mA (500 Ω)</td>
</tr>
<tr>
<td>Power supply</td>
<td>Unipolar</td>
</tr>
<tr>
<td>24 V DC</td>
<td>4 ... 20 mA (500 Ω)</td>
</tr>
<tr>
<td>Bridging of power failures</td>
<td>Current output range</td>
</tr>
<tr>
<td>10 ms (minimum)</td>
<td>Bipolar</td>
</tr>
<tr>
<td>Power consumption</td>
<td>±20 mA (500 Ω)</td>
</tr>
<tr>
<td>20 W</td>
<td>±50 mA (300 Ω)</td>
</tr>
<tr>
<td><strong>PROFIBUS DP interfaces</strong></td>
<td>Max. faults (over the entire temperature range)</td>
</tr>
<tr>
<td>Number of interfaces</td>
<td>0.4 %</td>
</tr>
<tr>
<td>2</td>
<td>Resolution of A/D converter</td>
</tr>
<tr>
<td>Baud rate</td>
<td>13 bit + sign</td>
</tr>
<tr>
<td>12 Mbit/s</td>
<td><strong>Counting pulse input (parameterizable)</strong></td>
</tr>
<tr>
<td>Max. cable length of a bus segment</td>
<td><strong>Digital inputs (parameterizable)</strong></td>
</tr>
<tr>
<td>100 m</td>
<td>Quantity</td>
</tr>
<tr>
<td>Connectable load per interface</td>
<td>3</td>
</tr>
<tr>
<td>5 V, max. 80 mA</td>
<td>Type of input</td>
</tr>
<tr>
<td><strong>Digital inputs (parameterizable)</strong></td>
<td>Type 1/2 compliant with IEC 1131-2</td>
</tr>
<tr>
<td>Quantity</td>
<td>Voltage range</td>
</tr>
<tr>
<td>12</td>
<td>±33 V DC</td>
</tr>
<tr>
<td>Type of input</td>
<td>0 signal level</td>
</tr>
<tr>
<td>Type 1 compliant with IEC 1131-2</td>
<td>-28 ... +3V</td>
</tr>
<tr>
<td>Voltage range</td>
<td>1 signal level</td>
</tr>
<tr>
<td>-30 ... +33 V DC</td>
<td>+8 ... +28 V</td>
</tr>
<tr>
<td>0 signal level</td>
<td>Load</td>
</tr>
<tr>
<td>-30 ... +5 V DC</td>
<td>1 ... 3 kΩ</td>
</tr>
<tr>
<td>1 signal level</td>
<td>Input frequency (f_{in})</td>
</tr>
<tr>
<td>+11 ... +30 V DC</td>
<td>0 ... 20 kHz</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>Counter resolution</td>
</tr>
<tr>
<td>3 groups of 4 digital inputs each</td>
<td>1/60 000 referred to measured value</td>
</tr>
<tr>
<td>Display</td>
<td>Updating interval</td>
</tr>
<tr>
<td>LED in display panel</td>
<td>2 ms</td>
</tr>
<tr>
<td><strong>Digital outputs (parameterizable)</strong></td>
<td><strong>Digital inputs with time tagging: AddFEM SoE</strong></td>
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<tr>
<td>Quantity</td>
<td>Quantity</td>
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<td>16</td>
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<td>Type of output</td>
<td>Time resolution</td>
</tr>
<tr>
<td>Digital semiconductor outputs</td>
<td>1 ms</td>
</tr>
<tr>
<td>Nominal output voltage</td>
<td><strong>Approvals/markings</strong></td>
</tr>
<tr>
<td>24 V DC</td>
<td>UL Recognition Mark</td>
</tr>
<tr>
<td>Output voltage with 0 signal</td>
<td>Underwriters Laboratories (UL) compliant with Standard UL 508 File E 85972</td>
</tr>
<tr>
<td>&lt; 1 V</td>
<td>CSA Certification Mark</td>
</tr>
<tr>
<td>Output voltage with 1 signal</td>
<td>Canadian Standard Association (CSA to Standard C22.2 No. 142 File LR 63533)</td>
</tr>
<tr>
<td>Power supply less 2 V</td>
<td>CE marking</td>
</tr>
<tr>
<td>500 mA</td>
<td>Compliant with EU directive 89/336/EEC &quot;Electromagnetic compatibility&quot;</td>
</tr>
<tr>
<td>Rated output current</td>
<td>Quality assurance</td>
</tr>
<tr>
<td>Yes</td>
<td>According to ISO 9001</td>
</tr>
<tr>
<td>Short-circuit proof</td>
<td><strong>Analog inputs (parameterizable)</strong></td>
</tr>
<tr>
<td>Yes (internal monitoring)</td>
<td>Inputs, total</td>
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<tr>
<td>Short-circuit-to-ground monitoring</td>
<td>12</td>
</tr>
<tr>
<td>Yes (8 outputs each with same reference potential)</td>
<td>Current input (fixed)</td>
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<tr>
<td>Galvanic isolation</td>
<td>6</td>
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<tr>
<td>6</td>
<td>Current/voltage input</td>
</tr>
<tr>
<td>Measuring range of current inputs (parameterizable)</td>
<td>Measuring range of current inputs (parameterizable)</td>
</tr>
<tr>
<td>0 ... 20 mA</td>
<td>0 ... 20 mA</td>
</tr>
<tr>
<td>4 ... 20 mA</td>
<td>4 ... 20 mA</td>
</tr>
<tr>
<td>-30 ... +30 mA</td>
<td>-30 ... +30 mA</td>
</tr>
<tr>
<td>Measuring range of voltage input (parameterizable)</td>
<td>Input impedance, current</td>
</tr>
<tr>
<td>0 ... 10 V</td>
<td>41.8 Ω</td>
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<tr>
<td>-10 ... +10 V</td>
<td>Input impedance, voltage</td>
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<tr>
<td>100 kΩ</td>
<td>Max. faults (over the entire temperature range)</td>
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<tr>
<td>0.2% relative to full-scale value</td>
<td>Resolution of A/D converter</td>
</tr>
<tr>
<td>Conversion method</td>
<td>13 bit + sign</td>
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<tr>
<td>Successive approximation</td>
<td><strong>Counting pulse input (parameterizable)</strong></td>
</tr>
<tr>
<td><strong>Approvals/markings</strong></td>
<td>Number of inputs</td>
</tr>
<tr>
<td>UL Recognition Mark</td>
<td>3</td>
</tr>
<tr>
<td>CSA Certification Mark</td>
<td>Type of input</td>
</tr>
<tr>
<td>CE marking</td>
<td>Type 1/2 compliant with IEC 1131-2</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>Voltage range</td>
</tr>
<tr>
<td>8</td>
<td>±33 V DC</td>
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<tr>
<td><strong>Counting pulse input (parameterizable)</strong></td>
<td>0 signal level</td>
</tr>
<tr>
<td>Number of inputs</td>
<td>-28 ... +3V</td>
</tr>
<tr>
<td>3</td>
<td>1 signal level</td>
</tr>
<tr>
<td>Type of input</td>
<td>+8 ... +28 V</td>
</tr>
<tr>
<td>Type 1/2 compliant with IEC 1131-2</td>
<td>Load</td>
</tr>
<tr>
<td>Voltage range</td>
<td>1 ... 3 kΩ</td>
</tr>
<tr>
<td>0 ... 20 kHz</td>
<td>Input frequency (f_{in})</td>
</tr>
<tr>
<td>Time resolution</td>
<td>0 ... 20 kHz</td>
</tr>
<tr>
<td>2 ms</td>
<td>Counter resolution</td>
</tr>
<tr>
<td>1/60 000 referred to measured value</td>
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<td>Number of outputs</td>
<td>Outputs, total</td>
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<td>8</td>
<td>0 ... 20 mA (500 Ω)</td>
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<tr>
<td>Type of output</td>
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</tr>
<tr>
<td>Digital semiconductor outputs</td>
<td>4 ... 20 mA (500 Ω)</td>
</tr>
<tr>
<td>Nominal output voltage</td>
<td>Current output range</td>
</tr>
<tr>
<td>24 V DC</td>
<td>Bipolar</td>
</tr>
<tr>
<td>Output voltage with 0 signal</td>
<td>±20 mA (500 Ω)</td>
</tr>
<tr>
<td>&lt; 1 V</td>
<td>±50 mA (300 Ω)</td>
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<tr>
<td>Output voltage with 1 signal</td>
<td>Max. faults (over the entire temperature range)</td>
</tr>
<tr>
<td>Power supply less 2 V</td>
<td>0.4 %</td>
</tr>
<tr>
<td>Rated output current</td>
<td>Resolution of A/D converter</td>
</tr>
<tr>
<td>500 mA</td>
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</tr>
<tr>
<td>Max. faults (over the entire temperature range)</td>
<td><strong>Approvals/markings</strong></td>
</tr>
<tr>
<td>0.4 %</td>
<td>UL Recognition Mark</td>
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<tr>
<td>Resolution of A/D converter</td>
<td>Underwriters Laboratories (UL) compliant with Standard UL 508 File E 85972</td>
</tr>
<tr>
<td>13 bit + sign</td>
<td>CSA Certification Mark</td>
</tr>
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<td><strong>Digital inputs with time tagging: AddFEM SoE</strong></td>
<td>Canadian Standard Association (CSA to Standard C22.2 No. 142 File LR 63533)</td>
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<td>Quantity</td>
<td>CE marking</td>
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<tr>
<td>Time resolution</td>
<td>Quality assurance</td>
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<tr>
<td>1 ms</td>
<td>According to ISO 9001</td>
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</table>
**Distributed I/O on the PROFIBUS**

**AddFEM:**
Redundant I/O module for fast response times

---

**Technical specifications**

<table>
<thead>
<tr>
<th>AddFEM HART</th>
<th>AddFEM HART</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General data</strong></td>
<td><strong>Approvals/markings</strong></td>
</tr>
<tr>
<td>Dimensions (H x W x D) in mm</td>
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<td>295 x 75 x 209</td>
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<td>Weight</td>
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<td>cULus hazardous locations approval</td>
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<td>24 V DC</td>
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<tr>
<td>Bridging of power failures</td>
<td>FM approval</td>
</tr>
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<td>10 ms (minimum)</td>
<td>FM hazardous locations approval, Division 2 / Zone 2</td>
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<td>20 W</td>
<td>ATEX certification Zone 2 to EN 50021 compliant with EU directive 94/9/EEC (explosion protection)</td>
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<td>Number of interfaces</td>
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<td>Baud rate</td>
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<td>100 m</td>
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<td>Connectable load per interface</td>
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<tr>
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<td><strong>Power supply for transmitters with four-wire system</strong></td>
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<td>Quantity</td>
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<td>Type of output</td>
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<td>Digital semiconductor outputs</td>
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<tr>
<td>Nominal output voltage</td>
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<tr>
<td>24 V DC</td>
<td></td>
</tr>
<tr>
<td>Output voltage with 0 signal</td>
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</tr>
<tr>
<td>&lt; 1 V</td>
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<tr>
<td>Output voltage with 1 signal</td>
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<tr>
<td>Power supply less 1 V</td>
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<tr>
<td>Rated output current</td>
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<td>500 mA</td>
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<td>250 mA</td>
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</tr>
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<td>Short-circuit-to-ground monitoring</td>
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<td>Yes (internal monitoring)</td>
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<tr>
<td><strong>Analog inputs (parameterizable)</strong></td>
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<tr>
<td>Measuring range of current inputs (parameterizable)</td>
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<tr>
<td>0 ... 20 mA / 4 ... 20 mA</td>
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<tr>
<td>Input impedance, current</td>
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<td>230 W</td>
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<td>14 bit + sign</td>
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<td>Conversion method</td>
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<tr>
<td>Successive approximation</td>
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<tr>
<td><strong>Analog outputs (parameterizable)</strong></td>
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<td>Current outputs</td>
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<td>8</td>
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</tr>
<tr>
<td>Current output range</td>
<td></td>
</tr>
<tr>
<td>0 ... 20 mA / 4 ... 20 mA</td>
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<tr>
<td>Max. faults (over the entire temperature range)</td>
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<tr>
<td>0.4 %</td>
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<td>14 bit + sign</td>
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<td><strong>HART protocol</strong></td>
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<tr>
<td>HART specification</td>
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<td>Rev 6.0</td>
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**Selection and Ordering Data**

<table>
<thead>
<tr>
<th>Order No.</th>
<th><strong>Front End Module AddFEM</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>6DL3 100-8AC</td>
<td>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>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>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>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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Industry Sector
Karlsruhe
Phone: +49 721 595-6053
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 V5, 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 segment (trunk line) and the intrinsically-safe fieldbus segments (spur line 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

The field barrier *-FB-Ex4.* field barrier mounted in different housing versions

The *-FB-Ex4.* field barrier can be supplied in an aluminium or stainless steel field housing. 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”.

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

The field barrier "-FB-Ex4.* is certified for use in Zone 1/21. A main line designed with "increased safety" (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 60079-27 and comply with the FISCO criteria. 40 mA are available per output for the intrinsically-safe power supply to the fieldbus nodes. 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. A terminating resistor is not required for the bus termination.

As a result of the low installation requirements, simple connection system and high flexibility, fieldbus architectures with field barriers prove to be extremely efficient, especially for planning, installation and maintenance.

Dimensional drawings

Connections for the non-intrinsically safe fieldbus segment

Connections for intrinsically safe fieldbus devices

More information

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Fax: +49 621 776 - 1000
E-mail: pa-info@de.pepperl-fuchs.com
Additional information is available in the Internet under:
http://www.pepperl-fuchs.de

Block diagram of "-FB-Ex4.* field barrier
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 (top) and a pneumatic basic module (bottom). The valves are then mounted on this.

Design of a valve slice

The valves and their electronic modules are intrinsically-safe (EEx-i). For servicing purposes, they can be replaced during ongoing operation. They can simply be removed to 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 can be mixed in between as desired for the two available air supplies of 300 l/min and 700 l/min.

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 support you during selection and combination of components, and provides the documentation, material list, dimensions and various diagrams for your configuration.
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 non-return valve for venting connections or with a separate auxiliary control air supply for use in an extended pressure range. 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 and switching cycle counters of the channels can be read out over PROFIBUS.

Technical specifications

<table>
<thead>
<tr>
<th>AirLINE Ex</th>
<th>88 (depending on type of valve)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of valve functions</td>
<td>1070 mm</td>
</tr>
<tr>
<td>Max. width of complete station</td>
<td>300 l/min or 700 l/min</td>
</tr>
<tr>
<td>Rated flow</td>
<td>0 … 8 bar</td>
</tr>
<tr>
<td>Pressure range</td>
<td>0 … 55 °C</td>
</tr>
<tr>
<td>Ambient temperature in operation</td>
<td>0 … 50 °C</td>
</tr>
<tr>
<td>• Horizontal installation</td>
<td>-40 … +70 °C</td>
</tr>
<tr>
<td>• All other mounting positions</td>
<td>IP 30</td>
</tr>
<tr>
<td>Ambient temperature during storage</td>
<td>KEMA 06 ATEX 0092, KEMA 06</td>
</tr>
<tr>
<td></td>
<td>ATEX 0093, IEC Ex KEM 07.0032,</td>
</tr>
<tr>
<td></td>
<td>IEC Ex KEM 07.0033,</td>
</tr>
<tr>
<td></td>
<td>FM available soon</td>
</tr>
</tbody>
</table>

More information

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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, MOBY D/E/I/U systems are linked into 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.
Simulation

8/2 Introduction
8/3 SIMBApro FAT:
Fieldbus simulation
8/5 SIMIT:
Simulation-based engineering
At present, the products listed below are 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; See main catalog ST PCS 7 for description and ordering data.

- **SIMBApro FAT**: SIMATIC PCS 7 add-on product for field bus simulation (PROFIBUS DP and PROFIBUS PA), including numerous functions for the factory acceptance test (FAT) at unit level.

- **SIMIT**: SIMATIC PCS 7 add-on product for dynamic plant simulation, e.g. for the overall plant test or the operator training.
Overview

The system for fieldbus simulation with numerous functions for the factory acceptance test (FAT)

SIMBApro FAT is based on the SIMBApro PCI simulation system. This permits simulation of the distributed I/Os (PROFIBUS DP and PA) up to unit level.

Aggregate typicals (valves, motors, etc.) are preassembled for the factory acceptance test of plants.

Import functions for the setup of I/O (HW Config) and for aggregate wiring (symbol table) enable FAT solutions to be created quickly and conveniently.

Note:
SIMBApro FAT can be used together with SIMATIC PCS 7 V5, V6 and V7.

Application

Configuration/engineering
• Early detection and clearance of configuration errors
• Early testing of project-specific blocks (technological function, alarm behavior)
• Early testing of sample solutions (e.g. sequencers)

Factory Acceptance Test
• Shortening the commissioning period thanks to tested configuration
• Test without modifying the original software
• Test of elementary automation functions (measurement and control loops, switching function)
• Integration test of the entire automation architecture
• Test of safety-relevant functions (emergency shutdowns)
• Documentation of the test results
• Simulation tools such as SIMIT can be linked for plant simulation

Function
• PCI technology
• Baud rate: max. 12 Mbit/s for PROFIBUS DP
• 2 x 125 slaves can be simulated
• Redundancy or 2 PROFIBUS DP buses
• Standard slaves and S7 slaves
• Library available for standard typicals
• Generation of own simulation functions (typicals)
• Import functions (HW-Config., symbol table)
• Definition of import filters
• Generation of distributed I/O faults

Factory acceptance test at unit level

The PC module SIMBApro PCI simulates the complete behavior of I/O devices on the fieldbus. The simulation is reaction-free, i.e. for the bus master there is no difference between communication with real and with simulated I/O devices. During the Factory Acceptance Test it is therefore possible to test the entire automation structure from the operator station to the driver connection and the hardware configuration.

The simulation of the distributed I/O is extended in SIMBApro FAT to include functions for the Factory Acceptance Test (FAT). Using the PC program, feedback signals from units (valves, pumps, switches) can be generated in less time by importing them from the STEP 7 / PCS 7 symbol table. Apart from normal plant operation, fault states can also be simulated. All diagnostic options of the PROFIBUS are available, ranging from missing or incorrect feedbacks to distributed I/O faults (failure of module, station or line).

SIMBApro FAT offers a library of easily configurable unit typicals for fast and reliable simulation of units. This enables feedbacks from valves, motors etc. to be generated in a simple manner, and this process can be automated by importing a symbol table. It is possible to set up a simulation for the factory acceptance test (FAT) in a very short time.

Users also have the option of creating their own library elements in order to take the special requirements of their plant into account. If the requirements for the simulation extend beyond the FAT functions (e.g. overall plant test), a plant simulation system (e.g. SIMIT) can have read and write access to the data in the I/O devices.
## SIMBApro FAT: Fieldbus simulation

### Selection and Ordering Data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>SIMBApro PCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AE4 100-1CC00</td>
<td><strong>1-channel for 1 PROFIBUS line with max. 125 PROFIBUS DP slaves</strong></td>
</tr>
<tr>
<td></td>
<td>• Cyclic data exchange</td>
</tr>
<tr>
<td></td>
<td>• Diagnostic functions</td>
</tr>
<tr>
<td></td>
<td>• Reloadable device functions, e.g. SIMOCODE, SIMOVERT, DANFOSS, ABB, CEAG, Pepper &amp; Fuchs</td>
</tr>
<tr>
<td></td>
<td>• Simulation of the SIMATIC S7/PCS 7 slaves (e.g. ET 200) with the specific SIMATIC functions</td>
</tr>
<tr>
<td></td>
<td>• Simulation of DP/PA links and DP/PA couplers</td>
</tr>
<tr>
<td>9AE4 100-1CD00</td>
<td><strong>2-channel for 2 PROFIBUS lines each with max. 125 PROFIBUS DP slaves each</strong></td>
</tr>
<tr>
<td></td>
<td>• Cyclic data exchange</td>
</tr>
<tr>
<td></td>
<td>• Diagnostic functions V1.0, V1.1</td>
</tr>
<tr>
<td></td>
<td>• Reloadable device functions, e.g. SIMOCODE, SIMOVERT, DANFOSS, ABB, CEAG, Pepper &amp; Fuchs</td>
</tr>
<tr>
<td></td>
<td>• Simulation of the SIMATIC S7/PCS 7 slaves (e.g. ET 200) with the specific SIMATIC functions</td>
</tr>
<tr>
<td></td>
<td>• Simulation of the SIMATIC redundancy functions</td>
</tr>
<tr>
<td>9AE4 100-1CE00</td>
<td><strong>1-channel for 1 PROFIBUS line with max. 125 PROFIBUS PA slaves</strong></td>
</tr>
<tr>
<td></td>
<td>• Simulation on physical PROFIBUS PA line</td>
</tr>
<tr>
<td></td>
<td>• Simulation of the specific PROFIBUS PA profiles (actuators, sensors)</td>
</tr>
</tbody>
</table>

### Services for every aspect of simulation

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

On request

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

### More information

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Additional information is available in the Internet under:  
http://www.siemens.com/SimbaPro
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 V5, 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 SIMATIC 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 can already be carried out in the virtual process in an early phase of the project.
Simulation

SIMIT: Simulation-based engineering

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 material flows in single-material systems. 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>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic system</strong></td>
<td>9AP1 413-2AA40 D)</td>
</tr>
<tr>
<td>SIMIT Basic</td>
<td>9AP1 413-2AA40 D)</td>
</tr>
<tr>
<td>SIMIT basic system for Windows 2000/XP Professional, 2 languages (German, English)</td>
<td></td>
</tr>
<tr>
<td>SIMIT ATS</td>
<td>9AP1 414-2AA30 D)</td>
</tr>
<tr>
<td>Preferred configuration for testing of PCS 7 user software, comprising:</td>
<td></td>
</tr>
<tr>
<td>• SIMIT Basic (9AP1 413-2AA40)</td>
<td></td>
</tr>
<tr>
<td>• PROFIBUS DP coupling (9AP1 434-2AA10)</td>
<td></td>
</tr>
<tr>
<td>• MCE (9AP1 440-2AA10)</td>
<td></td>
</tr>
<tr>
<td>• DGE (9AP1 442-2AA10)</td>
<td></td>
</tr>
<tr>
<td><strong>SIMIT couplings</strong></td>
<td>9AP1 430-2AA10 C)</td>
</tr>
<tr>
<td>MPI coupling</td>
<td>9AP1 430-2AA10 C)</td>
</tr>
<tr>
<td>Software module for linking SIMIT to SIMATIC S7 controllers via the multi-point interface</td>
<td></td>
</tr>
<tr>
<td>Can only be used in conjunction with MPI card or MPI adapter (USB, RS 232)!</td>
<td></td>
</tr>
<tr>
<td>OPC server coupling</td>
<td>9AP1 431-2AA10 D)</td>
</tr>
<tr>
<td>Software module for linking SIMIT to clients with OPC capability</td>
<td></td>
</tr>
<tr>
<td>OPC client coupling</td>
<td>9AP1 432-2AA10 C)</td>
</tr>
<tr>
<td>Software module for linking SIMIT to servers with OPC capability</td>
<td></td>
</tr>
<tr>
<td>PLC SIM coupling</td>
<td>9AP1 433-2AA10</td>
</tr>
<tr>
<td>Software module for linking SIMIT to S7 PLC SIM</td>
<td></td>
</tr>
<tr>
<td>Can only be used in conjunction with S7 PLC SIM Version 5.2 or higher!</td>
<td></td>
</tr>
<tr>
<td>PROFIBUS DP coupling</td>
<td>9AP1 434-2AA10 D)</td>
</tr>
<tr>
<td>Software module for linking SIMIT to the PROFIBUS DP of SIMATIC S7 PLCs</td>
<td></td>
</tr>
<tr>
<td>Can only be used for and in conjunction with SIMIT interface modules 9AP2 423-2AA10 and 9AP2 424-2AA10!</td>
<td></td>
</tr>
</tbody>
</table>

C) Subject to export regulations: AL: N, ECCN: EAR99S
D) Subject to export regulations: AL: N, ECCN: 5D992B1
### Selection and Ordering Data

#### SIMIT expansions

<table>
<thead>
<tr>
<th>Expansion</th>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI</td>
<td>Auto Control Interface, SIMIT expansion module for generation and implementation of automated simulation procedures</td>
<td>9AP1 436-2AA10</td>
</tr>
<tr>
<td>MCE</td>
<td>Macro Component Editor, SIMIT expansion module for generation of macros from standard library elements</td>
<td>9AP1 440-2AA10</td>
</tr>
<tr>
<td>CTE</td>
<td>Component Type Editor, SIMIT expansion module for generation of libraries and library elements</td>
<td>9AP1 441-2AA10</td>
</tr>
<tr>
<td>DGE</td>
<td>Dynamic Graphics Editor, SIMIT expansion module for graphic processing of model charts and operating screens; animated graphics</td>
<td>9AP1 442-2AA10</td>
</tr>
<tr>
<td>TME</td>
<td>Trend &amp; Message Editor, SIMIT expansion module for graphic display of signal trends and messages</td>
<td>9AP1 443-2AA10</td>
</tr>
<tr>
<td>SMD</td>
<td>Structured Model Diagrams, SIMIT expansion module for generation of models from templates and tables (PCS 7 Import/Export Assistant)</td>
<td>9AP1 444-2AA10</td>
</tr>
</tbody>
</table>

#### SIMIT library

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FlowNet</td>
<td>SIMIT library for modeling material flows in single-material systems using flow networks; contains process engineering components for modeling such as equipment, tanks, pumps, pipes, etc.</td>
<td>9AP1 450-2AA10</td>
</tr>
</tbody>
</table>

#### Documentation

- Complete documentation in electronic form (PDF files) with SIMIT Basic software on CD-ROM; also available as hard copy on request

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### Selection and Ordering Data

#### SIMIT interface modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM-1</td>
<td>Interface module for SIMIT for simulation of PROFIBUS DP slaves: single-channel PCI plug-in card for simulation of one DP segment with max. 125 DP slaves; same design as SIMBApro PCI</td>
<td>9AP2 423-2AA10</td>
</tr>
<tr>
<td>IM-2</td>
<td>Interface module for SIMIT for simulation of PROFIBUS DP slaves: two-channel PCI plug-in card for simulation of two DP segments with max. 125 DP slaves each; same design as SIMBApro PCI</td>
<td>9AP2 424-2AA10</td>
</tr>
</tbody>
</table>

#### Service

- Software updating contract: Provision of updates and upgrades, access to SIMIT hotline | 9AP1 470-2AD00 |
- SIMIT consulting: Consulting on a daily basis, customer-specific training | 9AP1 471-2AD00 |

D) Subject to export regulations: AL: N, ECCN: 5D992B1

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### More information

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http://www.siemens.de/simit
<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/2</td>
<td>BANY: Bus analysis for SIMATIC Ethernet and PROFIBUS networks</td>
</tr>
<tr>
<td>9/4</td>
<td>Amprolyzer: Bus monitor for PROFIBUS diagnostics</td>
</tr>
<tr>
<td>9/5</td>
<td>System diagnostics for PROFIBUS DP/PA slaves</td>
</tr>
<tr>
<td>9/7</td>
<td>ibaPDA/ibaAnalyzer: Fault tracking log - recording and analysis</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, diagnosis, and documentation of the Ethernet and PROFIBUS networks is shared as shown below between two independent program packages, which are offered both individually and as a bundle.

Note:
BANY can be used together with SIMATIC PCS 7 V5, 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

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 PROFIBUS 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.
Diagnostics

Amprolyzer: Bus monitor for PROFIBUS diagnostics

Overview

The bus monitor Amprolyzer V3.2 (Advanced Multicard PROFIBUS Analyzer) offers powerful software for PROFIBUS diagnostics, which is recommended for commissioning and service engineers in particular.

Note: The Amprolyzer V3.2 can be used with SIMATIC PCS 7 V5, V6 and V7 for PROFIBUS diagnostics.

Function

**Essential functions of Amprolyzer V3.2**

- Message frame recording with trigger and filter options relating to events and message frame contents, including time stamp
- Storing and exporting message frame recordings in Excel format
- Lifelist containing all PROFIBUS nodes located on the bus
- 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
- CP5611 communications processor (PCI)  
  **Note:** SIMATIC Field PG, Power PG, PG720 and PG740 use the CP5611 as an integrated PROFIBUS interface
- Ethernet 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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Additional information is available in the Internet under:  
http://support.automation.siemens.com/WW/view/de/18818699
Overview

The operator in the control center requires not only extensive information about the automated process, but also information about the status of the instrumentation and control technology. Using the system diagnostics for PROFIBUS DP/PA slaves, the essential properties of the PROFIBUS DP/PA devices can be diagnosed and displayed on an operator station. PROFIBUS DP master systems can be SIMATIC PCS 7 automation systems of the SIMATIC S7-400 range - standard systems or also fault-tolerant or safety-related systems.

All functions are provided by an AS block and an OS object (ActiveX Control). The AS block records the information of the configured master system and sends the data to the operator system.

The OS object displays the PROFIBUS DP line configured using the SIMATIC PCS 7 engineering system (AS-Engineering) including all PROFIBUS DP stations in an overview display. From this 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 diagnostic 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 system diagnostics for PROFIBUS DP/PA slaves can be used together with SIMATIC PCS 7 V6 and V7.

With the PCS 7 Asset Management, 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 control- ers, this includes network components and plant bus as well as server and clients of the operator systems. See Catalog ST PCS 7 for details.
System diagnostics for PROFIBUS DP/PA slaves

S7-400 CPU diagnostics
As central I&C components, the CPUs of the SIMATIC PCS 7 automation systems are particularly important. Using the integral 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.

System requirements
The SIMATIC PCS 7 system requirements apply analogous to SIMATIC PCS 7 V6.0, V6.1 or V7.0.

Licensing
A license is required for each operator station on which the OS object 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.

<table>
<thead>
<tr>
<th>Selection and Ordering Data</th>
<th>Order No</th>
</tr>
</thead>
<tbody>
<tr>
<td>System diagnostics for PROFIBUS DP/PA slaves</td>
<td>2XV9 450-1SD12</td>
</tr>
<tr>
<td>Single License for 1 installation, in 2 languages (German, English); additional languages can be configured by the user</td>
<td></td>
</tr>
<tr>
<td>Runtime software and electronic documentation on CD-ROM</td>
<td></td>
</tr>
<tr>
<td>Can be used for SIMATIC PCS 7 V6.0, V6.1 und V7.0 in accordance with the system requirements of SIMATIC PCS 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System diagnostics for S7-400 CPUs</th>
<th>2XV9 450-1SD08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single License for 1 installation, in 2 languages (German, English); additional languages can be configured by the user</td>
<td></td>
</tr>
<tr>
<td>Runtime software and electronic documentation on CD-ROM</td>
<td></td>
</tr>
<tr>
<td>Can be used for SIMATIC PCS 7 V6.0, V6.1 und V7.0 in accordance with the system requirements of SIMATIC PCS 7</td>
<td></td>
</tr>
</tbody>
</table>

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

More information
Siemens AG
Industry Sector
Erlangen
Phone: +49 9131 7-46111
Fax: +49 9131 7-44757
E-mail: it4industry@siemens.com

Additional information is available in the Internet under:
http://www.siemens.com/systemdiagnostics_profibus-slaves
Whereas process control systems are generally operated with cycle times of between 50 ms and 4 s, faults can come and go at a considerably faster rate so that they are not detected within these CPU cycles. In addition, some faults only occur very sporadically. Systems such as ibaPDA and ibaAnalyzer for recording and analyzing fault sequence logs offer valuable support in tracing such faults.

ibaPDA is a program package for recording fault sequence logs on a separate recording computer (PC) which is either connected to the PROFIBUS DP using a special PCI card from iba or communicates online with the automation system’s CPU by means of the ibaPDA-interface-S7-Analyzer via MPI, CP/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 V5, V6 and V7.
Diagnostics

ibaPDA/ibaAnalyzer: Fault tracking log - recording and analysis

**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

**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
Iba AG
Königswarterstraße 44
90762 Fürth
Germany
Phone: +49 911-97282-0
Fax: +49 911-97282-33
E-mail: sales@iba-ag.com

Additional information is available in the Internet under: [http://www.iba-ag.com](http://www.iba-ag.com)
SIMATIC PCS 7 LAB: Compact control system for the laboratory automation
One feature of laboratory work is the frequent modification of experiments through which valuable knowledge, data and parameters are gained for series production. Particularly essential for automation of the laboratory - in addition to high quality, efficiency and safety - is therefore fast and flexible adaptation of the laboratory equipment to the automation technology. 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.

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 "Starter systems, SIMATIC PCS 7 BOX"). 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. This can be extended by SIMATIC BATCH and SIMATIC Route Control functionalities.

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.
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: Al RTD 4 x Pt100
  - SM 332 analog output module: AO I 8 x 0/4 ... 20 mA
  - 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 CP341 are connected to two 9-pole sub-D connectors.

ET 200pro I/O module

The ET 200pro I/O module with high IP65 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 145 analog output module: AO I 4 x +/-20 mA
    - 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

Actuators and sensors are connected via 5-pole M12 plugs to the connection modules of the electronic modules.

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

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
IA CC CCG
Siemensallee 84
76187 Karlsruhe
Germany

Technical specifications

<table>
<thead>
<tr>
<th>SIMATIC PCS 7 LAB modules</th>
<th>Dimensions (WxHxD) in mm</th>
<th>Weight in kg</th>
<th>Degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC module</td>
<td>585 x 300 x 332</td>
<td>21</td>
<td>IP20</td>
</tr>
<tr>
<td>I/O module ET 200M</td>
<td>585 x 300 x 332</td>
<td>19</td>
<td>IP20</td>
</tr>
<tr>
<td>I/O module ET 200pro</td>
<td>500 x 180 x 85</td>
<td>5.5</td>
<td>IP65</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>
</tbody>
</table>

Selection and Ordering Data

Order No. 6DL3 902-1BA00
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
- 1 x license for SIMATIC PCS 7 Visualization, floating license for 1 user
- 1 x CD with software and documentation for WinAC Slot 412/416
- 1 x documentation for SIMATIC PCS 7 LAB and SIMATIC Box PC 627B

Order No. 6DL3 902-2BA00
SIMATIC PCS 7 LAB ET 200pro
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 200pro I/O module
- 1 x POWER module
- 1 x mouse (USB)
- 1 x keyboard (USB)
- 1 x backup battery for WinAC Slot 416
- 1 x ECOFAST cable, 10 m
- 1 x ECOFAST cable, 5 m
- 2 x ECOFAST bus termination connector
- 2 x power cable “Europe”
- 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 documentation for SIMATIC PCS 7 LAB and SIMATIC Box PC 627B
## Selection and Ordering Data

<table>
<thead>
<tr>
<th>Option</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SER module for SIMATIC PCS 7 LAB</td>
<td>6DL4 903-1AA</td>
</tr>
<tr>
<td>Module with eight RS 232C serial interfaces for connection of external devices</td>
<td></td>
</tr>
<tr>
<td>Type of delivery:</td>
<td></td>
</tr>
<tr>
<td>• 1 x SER module</td>
<td></td>
</tr>
<tr>
<td>• 1 x power cable &quot;Europe&quot;</td>
<td></td>
</tr>
<tr>
<td>• 1 x ECOFAST cable, 10 m</td>
<td></td>
</tr>
<tr>
<td>• 1 x ECOFAST bus termination connector</td>
<td></td>
</tr>
<tr>
<td>• 1 x CD for CP 341</td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Power cable, 3 m</th>
<th>Accessory Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Great Britain</td>
<td>6ES7 900-0BA00-0XA0</td>
</tr>
<tr>
<td>For Switzerland</td>
<td>6ES7 900-0CA00-0XA0</td>
</tr>
<tr>
<td>For the USA</td>
<td>6ES7 900-0DA00-0XA0</td>
</tr>
<tr>
<td>For Italy</td>
<td>6ES7 900-0EA00-0XA0</td>
</tr>
<tr>
<td>For China</td>
<td>6ES7 900-0FA00-0XA0</td>
</tr>
</tbody>
</table>

### 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 ‘Starter systems, SIMATIC PCS 7 BOX’).

## More information

Siemens AG  
Industry Sector  
Industry Automation  
Karlsruhe, Germany  
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Fax: +49 721 595-4711  
E-mail: addon_s2.aud@siemens.com

Additional information is available in the Internet under:  
[http://www.siemens.com/simatic-pcs7-lab](http://www.siemens.com/simatic-pcs7-lab)
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 V5, 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.
### Selection and Ordering Data

<table>
<thead>
<tr>
<th>Cabinet design</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8MC cabinet</td>
<td>6DL2 800-</td>
</tr>
<tr>
<td><strong>Cabinet design</strong></td>
<td></td>
</tr>
<tr>
<td>Cabinet with 19” rack frame, crane lifting lugs,</td>
<td>1 A</td>
</tr>
<tr>
<td>lock and release lever handle, pocket for circuit</td>
<td></td>
</tr>
<tr>
<td>diagram</td>
<td></td>
</tr>
<tr>
<td>Dimensions WxHxD 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 B</td>
</tr>
<tr>
<td>• Cabinet with single wing door 2000 x 800 x 400, IP20</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</td>
<td>4 G</td>
</tr>
<tr>
<td>2000 x 1000 x 600, IP40</td>
<td></td>
</tr>
<tr>
<td>• Cabinet with single wing door 2200 x 800 x 400, IP20</td>
<td>5 J</td>
</tr>
<tr>
<td>• Cabinet with single-wing doors on front and back</td>
<td>6 K</td>
</tr>
<tr>
<td>2200 x 800 x 600, IP20</td>
<td></td>
</tr>
</tbody>
</table>

| Socket dimensions WxD in mm:                        |           |
| • without socket                                    | X         |
| • Socket 800 x 400                                  | A         |
| • Socket 800 x 600                                  | B         |
| • Socket 1000 x 400                                 | C         |
| • Socket 1000 x 600                                 | D         |

| Side panel dimensions WxD in mm:                    |           |
| • without side panel                                | 0         |
| • Side panel on left or right                       |           |
| - 2000 x 400                                        | 1         |
| - 2000 x 600                                        | 3         |
| - 2200 x 400                                        | 5         |
| - 2200 x 600                                        | 7         |
| • Side panel on left and right                      |           |
| - 2000 x 400                                        | 2         |
| - 2000 x 600                                        | 4         |
| - 2200 x 400                                        | 6         |
| - 2200 x 600                                        | 8         |

| Instrumentation and control monitoring              |           |
| • without instrumentation and control monitoring   | 0         |
| • Monitoring of the circuit breakers (only for ETA), | 1         |
| display on cabinet lamp                             |           |
| • Monitoring of circuit-breaker (only with ETA),    | 2         |
| overheating, door monitoring, OLM, display on      |           |
| cabinet lamp and via DI-module 6ES7421-7DH00-0BA0  |           |
| (DI-module to be ordered separately)               |           |

### Infeed

<table>
<thead>
<tr>
<th>8MC cabinet</th>
<th>6DL2 800-</th>
</tr>
</thead>
</table>

| Infeed                                              |           |
| • no infeed                                         | 0 X       |
| • DC 24 V with                                      |           |
| - 4 x Siemens circuit breakers                     | 1 A       |
| - 8 x Siemens circuit breakers                     | 1 B       |
| - 12 x Siemens circuit breakers                    | 1 C       |
| - 6 x ETA circuit breakers with aux contact        | 1 E       |
| - 12 x ETA circuit breakers with aux contact       | 1 H       |
| • DC 24 V redundant with                            |           |
| - 4 x Siemens circuit breakers                     | 2 A       |
| - 8 x Siemens circuit breakers                     | 2 B       |
| - 12 x Siemens circuit breakers                    | 2 C       |
| - 6 x ETA circuit breakers with aux contact        | 2 E       |
| - 12 x ETA circuit breakers with aux contact       | 2 H       |
| • AC 120/230 V with                                 |           |
| - 4 x Siemens circuit breakers                     | 3 A       |
| - 8 x Siemens circuit breakers                     | 3 B       |
| - 12 x Siemens circuit breakers                    | 3 C       |
| - 6 x ETA circuit breakers with aux contact        | 3 D       |
| - 12 x ETA circuit breakers with aux contact       | 3 E       |

### Installation of system unit

| X         |
| 1 A       |
| B         |
| C         |
| D         |

### Documentation

<table>
<thead>
<tr>
<th>8MC cabinet</th>
<th>6DL2 800-</th>
</tr>
</thead>
</table>

| Documentation                                       |           |
| • without documentation                             | 0         |
| • general description of cabinet                   | 1         |
| • Cabinet-specific documentation with AutoCAD drawings | 3         |
| • General description and cabinet-specific         | 5         |
| documentation with AutoCAD drawings                |           |
| • German                                            |           |
| • English                                           |           |
## Selection and Ordering Data

<table>
<thead>
<tr>
<th>Cabinet Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ET 200M peripheral device</strong></td>
<td>6DL2802-</td>
</tr>
</tbody>
</table>

### PROFIBUS
- PROFIBUS DP in copper, for IM 153-1 and IM 153-2: 1
- PROFIBUS DP in copper, for redundant IM 153-2: 2
- PROFIBUS DP in FIBER OPTIC, for IM 153-1 and IM 153-2: 3
- PROFIBUS DP in fiber optic, for redundant IM 153-2: 4

### ET-line
- ET-line for non-redundant IM 153 without individual fusing 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...): A A
- ET-line for redundant IM 153 without individual fusing of the I/O modules, with one circuit-breaker for first IM 153, with one circuit-breaker for second IM 153 and one circuit-breaker for load power supply (circuit-breakers must be ordered together with cabinet 6DL2800...): B A
- ET-line for redundant IM 153 without individual fusing of the I/O modules, with one circuit-breaker for first IM 153, with one circuit-breaker for second IM 153. The load power supply is fed via a diode module from the circuit-breakers of the IM (circuit-breakers must be ordered together with cabinet 6DL2800...): C A
- ET-line AC 230V for redundant IM 153 without individual fusing of the I/O modules, with one circuit-breaker for first PS 230 V, with one circuit-breaker for second PS 230 V. The load power supply is fed via a diode module from both PS’s (circuit-breakers must be ordered together with cabinet 6DL2800...): D A
- ET-line for non-redundant IM 153 with individual fusing 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 load power supply (circuit-breakers must be ordered together with cabinet 6DL2800...): A B
- ET-line for redundant IM 153 with individual fusing of the I/O modules, with one circuit-breaker for first IM 153, with one circuit-breaker for second IM 153 and one circuit-breaker for load power supply (circuit-breakers must be ordered together with cabinet 6DL2900...): B B
- ET-line for redundant IM 153 with individual fusing of the I/O modules, with one circuit-breaker for first IM 153, with one circuit-breaker for second IM 153. The load power supply is fed via a diode module from the circuit-breakers of the IM (circuit-breakers must be ordered together with cabinet 6DL2800...): C B
- ET-line AC 230 V for redundant IM 153 with individual fusing of the I/O modules, with one circuit-breaker for first PS 230 V, with one circuit-breaker for second PS 230 V. The load power supply is fed via a diode module from both PS’s (circuit-breakers must be ordered together with cabinet 6DL2800...): D B
Options

Project-specific cabinets

Apart from the standardized cabinets, we manufacture cabinets for specific projects or customer requirements:

- Cabinets of different sizes and designs
- Small wall-mounted enclosure for distributed configuration
- Outdoor units with air conditioning

All are offered optionally as Ex versions and with non-standard degrees of protection such as NEMA 4x or IP66.

More Information

Siemens AG
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Karlsruhe
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E-mail: addon_s2.aud@siemens.com
Cabinet construction
Overview

- SICLOCK TC 400 or SICLOCK TM/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
- GPS or DCF77 radio clocks for direct connection to PCs, SIMATIC S7 controllers and to the SICLOCK TC 400 and SICLOCK TM/TS central plant clocks
- Pulse converter for electrical and optical distribution and interface conversion
- Complete packages for common applications

Note:
The SICLOCK time synchronization can be used together with SIMATIC PCS 7 V5, V6 and V7.

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 large plants with many network stations and stringent requirements for timekeeping, the time synchronization is performed using a SICLOCK TC 400 or SICLOCK TM/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, whereby the corresponding DCF or GPS radio clock is directly connected to the COM interface of the PC.
- Stand-alone systems:
  - for SIMATIC S7 controllers or small systems, e.g. for laboratory automation, SICLOCK DCFS7 is a low-cost alternative to DCF77 synchronization directly over an S7 digital input.

Design

SICLOCK TC 400 and SICLOCK TM/SICLOCK TS are constructed for mounting on a SIMATIC rail. Sets of materials for installation in 19-inch racks are also available.

Function

Central plant clocks

The SICLOCK TC 400 and SICLOCK TM/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 PTCP.

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 TM

SICLOCK TM 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 eight additional outputs for point-to-point connections with RS232, RS422, and TTY 20 mA.

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.
### SICLOCK TC 400 central plant clock

**Selection and Ordering Data**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2XV9 450-2AR10 A)</td>
<td>SICLOCK TC 400 preferred packages&lt;br&gt;SICLOCK TC 400 GPS1000&lt;br&gt;SICLOCK TC 400 central plant clock with four Ethernet interfaces + GPS1000 radio clock&lt;br&gt;Package comprises&lt;br&gt;• SICLOCK TC 400&lt;br&gt;• SICLOCK GPS1000 system with antenna frame&lt;br&gt;• Lightning protection for GPS&lt;br&gt;Complete solution, e.g. for use in PCS 7</td>
</tr>
</tbody>
</table>

| 2XV9 450-2AR20 | SICLOCK TC 400 DCF77<br>SICLOCK TC 400 central plant clock with four Ethernet interfaces + DCFRS radio clock, industrial version; package comprises<br>• SICLOCK TC 400<br>• Active DCF77 antenna with TTY output (20 mA line current) and antenna frame<br>• Junction box<br>• 1 m connecting cable mounted, extendable to 1000 m |

| 2XV9 450-2AR01 | SICLOCK TC 400 single device<br>SICLOCK TC 400 central plant clock with four Ethernet interfaces<br>A) Subject to export regulations: AL: N, ECCN: 7A994A |

### SICLOCK TM central plant clock

**Selection and Ordering Data**

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<tr>
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<tbody>
<tr>
<td>2XV9 450-1AR26</td>
<td>SICLOCK TM DCF77&lt;br&gt;SICLOCK TM central plant clock with Ethernet interface + DCFRS radio clock, industrial version; package comprises&lt;br&gt;• SICLOCK TM in stainless steel housing for rail mounting&lt;br&gt;• Active DCF77 antenna with TTY output (20 mA line current) and antenna frame&lt;br&gt;• Junction box&lt;br&gt;• 1 m connecting cable mounted, extendable to 1000 m</td>
</tr>
</tbody>
</table>

| 2XV9 450-1AR27 | - with SICLOCK TM<br>24 … 110 V DC<br>- with SICLOCK TM<br>90 … 230 V AC/DC |

| 2XV9 450-1AR24 A) | SICLOCK TM GPSDEC<br>SICLOCK TM central plant clock with Ethernet interface + GPSDEC radio clock, package comprises<br>• SICLOCK TM in stainless steel housing for rail mounting<br>• GPS antenna with antenna frame<br>• 22 m coax antenna cable (max. length 70 m, see accessories)<br>• GPSDEC decoder with power supply<br>• 5 m RS232 connection cable<br>• Parameterization software for PC<br>• 5 m RS232 connection cable<br>- with SICLOCK TM<br>24 … 110 V DC<br>- with SICLOCK TM<br>90 … 230 V AC/DC |

| 2XV9 450-1AR25 A) | - with SICLOCK TM<br>24 … 110 V DC<br>- with SICLOCK TM<br>90 … 230 V AC/DC |

| 2XV9 450-1AR50 A) | SICLOCK TM GPS1000<br>SICLOCK TM central plant clock with Ethernet interface + GPS1000 radio clock, package comprises<br>• SICLOCK TM in stainless steel housing for rail mounting<br>• GPS1000 antenna head with antenna frame<br>• GPS1000 power supply<br>• 5 m RS232 connection cable<br>• Junction box<br>• 5 m RS232 connection cable<br>- with SICLOCK TM<br>24 … 110 V DC<br>- with SICLOCK TM<br>90 … 230 V AC/DC |

| 2XV9 450-1AR51 A) | - with SICLOCK TM<br>24 … 110 V DC<br>- with SICLOCK TM<br>90 … 230 V AC/DC |

| 2XV9 450-1AR22 | SICLOCK TM single device<br>SICLOCK TM central plant clock with Ethernet interface, in stainless steel housing for rail mounting<br>• SICLOCK TM 24 … 110 V DC<br>• with SICLOCK TM<br>90 … 230 V AC/DC |

| 2XV9 450-1AR23 | - with SICLOCK TM<br>24 … 110 V DC<br>- with SICLOCK TM<br>90 … 230 V AC/DC |
## Time synchronization

### SICLOCK time synchronization

#### SICLOCK TS central plant clock

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

#### Selection and Ordering Data

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<tbody>
<tr>
<td>SICLOCK DCFEMP, receiver with TTY interface</td>
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<tr>
<td>Order No. 2XV9 450-1AR61</td>
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</tbody>
</table>

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, package comprises

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

| SICLOCK DCFS7 | Order No. 2XV9 450-1AR36 |

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

• SICLOCK DCFRS, radio clock with RS232 output, 20 m connecting cable and mounting bracket
• SICLOCK DCFS7 interface
• SICLOCK DCFS7 receiving service (STEP 7 function block for integration in S7 software)

#### Accessories for SICLOCK DCFS7

<table>
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<tr>
<td>SICLOCK DCFS7 interface + receiving service</td>
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<td>Order No. 2XV9 450-1AR30</td>
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(STEP 7 function block for integration in S7 software)

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<tr>
<td>SICLOCK DCFS7 receiving service</td>
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<td>Order No. 2XV9 450-1AR32</td>
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</table>

(STEP 7 function block for integration in S7 software)
## Selection and Ordering Data

### SICLOCK WINGPS, radio clock for Windows

GPS radio clock for the time synchronization of individual PCs in industrial environments with high levels of interference, package comprises:
- GPS antenna with antenna frame
- WINGPS decoder with power supply
- 22 m coax antenna cable (max. length 70 m, see accessories)
- 20 m PC connection cable WINGPS
- DCF77 receiving service for Windows NT/2000/2003/XP

**Order No.** 2XV9 450-1AR13

### SICLOCK GPSDEC, radio clock for Windows

GPS radio clock for the time synchronization of the SICLOCK TM/TS central plant clocks or programmable logic controllers in industrial environments with high levels of interference, package comprises:
- GPS antenna with antenna frame
- GPSDEC decoder with power supply
- 22 m coax antenna cable (max. length 70 m, see accessories)
- 5 m RS232 connecting cable GPSDEC
- Parameterization program

**Order No.** 2XV9 450-1AR00

### GPS1000 + power supply, radio clock for Windows

GPS radio clock for the time synchronization of PCs, programmable controllers, as well as the SICLOCK TM and SICLOCK TS central plant clocks in industrial environments with high levels of interference with distances up to 1000 m between the antenna and the device, package comprises:
- GPS1000 antenna head with antenna frame
- GPS1000 power supply
- Junction box
- 5 m RS232 connecting cable
- DCF77 receiving service for Windows NT/2000/2003/XP

**Order No.** 2XV9 450-1AR82

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

More information

Siemens AG
Industry Sector
Erlangen

SICLOCK hotline
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Fax: +49 (0)9131 18-84456
Email: siclock@siemens.com

Additional information is available in the Internet under:
http://www.siemens.com/siclock
http://www.siemens-edm.de/siclock_zeitsynchronisation.0.html
PCS 7 Engineering Auditor

S7 SmartLabel:
Generation of I/O labeling strips
The PCS 7 Engineering Auditor is used to archive defined parameters of a SIMATIC PCS 7 project at a desired point in time. The data export can be called interactively by the user. Time-controlled operation (called by Windows scheduler) is also possible.

Different parts of projects can be recorded by repeated calling with different filters. The filter defines which types of block are to be read. A list of desired parameters can be defined for each type of block. The system then automatically determines all instances matching this filter.

The relevant data are saved in a Microsoft Access database. The data include the following:
- Time of reading
- CPUs present in the SIMATIC PCS 7 project
- Block types including version
- Block instances (name, location)
- Block parameters including values and linking information

Note
The PCS 7 Engineering Auditor can be used together with SIMATIC PCS 7 V6.

The Engineering Auditor provides the following functions:
- Selection of desired PCS 7 project
- Definition of data to be exported using export filters
- Interactive calling of data export by user
- Time-based data export with use of the Windows scheduler
- Reading of relevant data from the PCS7 project (CFC) and saving in a Microsoft Access database
- Further processing of read data within Microsoft Access, e.g. flexible searching for parameters, comparison of block versions etc.

Microsoft Access 2000, XP or 2003 is required to display and evaluate the project data (license not included in scope of supply of PCS 7 Engineering Auditor).

Possible applications of the Engineering Auditor include:
- Documentation updating of all plant parameters
- Documentation of parameters during engineering and commissioning
- Documentation of parameters for different product versions
- Analysis and optimization of parameters from plant sections by comparison of parameters sets
- Cross-AS comparison and analysis of AS block releases
- Automated archiving of critical parameters from the complete plant

Additional information is available in the Internet under: [http://www.siemens.de/pcs7-tools](http://www.siemens.de/pcs7-tools)
**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 V5 (V5.1 and higher), V6 and V7.

**Benefits**

- Addresses, symbolic names and other data (e.g. resource codes or slots) do not have to be edited individually for the printout, but can be taken directly from the SIMATIC PCS 7 project.
- This achieves 90% time savings over manual creation of labels, recouping the costs after just one day.
- Potential editing errors are eliminated.
- Printout on different media: paper, transparencies or label sheets.
- Perforated label sheets avoid the time-consuming cutting of the individual labels.
- Support in the generation of new module layouts.
- Brand labeling: You can also integrate your company logos.
- Support of all Microsoft Windows-compatible printers.
- Software and layout templates can be downloaded from the Internet.

**Function**

A SIMATIC PCS 7 project already contains all the data for labeling the modules.

You do not have to copy, import, export or edit any other data. S7-SmartLabel adopts addresses, symbolic names and other data (e.g. resource identifiers, or slot) directly from the SIMATIC PCS 7 project. S7-SmartLabel then assigns the associated data to the configured I/O modules. Using this information, the module-specific labeling strips are created and output "with 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**

<table>
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<tr>
<th>Order No.</th>
<th>S7-SmartLabel V3.0 for SIMATIC PCS 7 V5.1/V6.x/V7.0 Single License for one installation Type of delivery: CD-ROM and authorization diskette</th>
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<tr>
<td>2XV9 450-1SL03-0YX0</td>
<td>C) Upgrade S7-SmartLabel to V3.0 Single License for one installation Type of delivery: CD-ROM and authorization diskette</td>
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</tbody>
</table>

**Label sheets**

- Centralized I/O for SIMATIC PCS 7
- Distributed I/O for SIMATIC PCS 7

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

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

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

**More information**

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Industry Sector
Erlangen

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Fax: +49 9131 7-44757
E-mail: it4industry@siemens.com

Additional information is available in the Internet under:

http://www.siemens.de/IT4Industry
### Appendix

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<td>Export regulations</td>
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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

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 Automation and Drives 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
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All the services offered are marked in currency-neutral credits, so you can use the Automation Value Card worldwide.

Automation Value Card order numbers

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<tr>
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<td>10000</td>
<td>6ES7 997-0BG00-0XA0</td>
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Detailed information on the services offered is available on our Internet site at:

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

Service & Support à la Card: Examples

Technical Support

- “Priority” Priority processing for urgent cases
- “24 h” Availability round the clock
- „Extended” Technical consulting for complex questions

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In addition to the search criteria Technology, Sector and Country, you can also search by Company and ZIP Code. From there it is only a small step to making the first contact.

Call up the Solution Partner Finder as follows:
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  On the start page via "Contacts & Partners; Siemens Solution Partner Automation and Power Distribution"
- CA 01 online:
  Go directly to the Solution Partner Finder:
  www.siemens.com/automation/partnerfinder

Additional information about the Siemens Solution Partner Program is available in the Internet at:
www.siemens.com/automation/solutionpartner
Software Licenses

Overview

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

- Engineering software
- Runtime software

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

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

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

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery can be found in the readme file supplied with the relevant product(s).

License types
Siemens Automation & Drives offers various types of software license:

- Floating license
- Single license
- Rental license
- Trial license

Floating license
The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.

A license is required for each concurrent user.

Single license
Unlike the floating license, a single license permits only one installation of the software.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per device, per axis, per channel, etc.

One single license is required for each type of use defined.

Rental license
A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific number of hours (the operating hours do not have to be consecutive).

One license is required for each installation of the software.

Trial license
A trial license supports "short-term use" of the software in a nonproductive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Factory license
With the Factory License the user has the right to install and use the software at one permanent establishment only. The permanent establishment is defined by one address only. The number of hardware devices on which the software may be installed results from the order data or the Certificate of License (CoL).

Certificate of license
The Certificate of License (CoL) is the licensee’s proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading
The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Delivery versions
Software is constantly being updated. The following delivery versions can be used to access updates.

- 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 Automation & Drives supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

PowerPack
PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.

A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade
An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.

The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.

A separate upgrade must be purchased for each original license of the software to be upgraded.

ServicePack
Service Packs 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 Automation & Drives supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Detailed explanations concerning license conditions can be found in the “Terms and Conditions of Siemens AG” or under http://www.siemens.com/automation/mail (A&D Mail Online-Help System)
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### Export regulations

The products listed in this catalog / price list may be subject to European / German and/or US export regulations. Therefore, any export requiring a license is subject to approval by the competent authorities. According to current provisions, the following export regulations must be observed with respect to the products featured in this catalog / price list:

**AL**
- Number of the German Export List
- Products marked other than “N” require an export license.
- In the case of software products, the export designations of the relevant data medium must also be generally adhered to.
- Goods labeled with an “AL” not equal to “N” are subject to a European or German export authorization when being exported out of the EU.

**ECCN**
- Export Control Classification Number
- Products marked other than “N” are subject to a re-export license to specific countries.
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