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SIMATIC

PCS 7 process control system What's new in PCS 7 (V7.1)?

Readme

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

A DANGER

indicates that death or severe personal injury will result if proper precautions are not taken.

MARNING

indicates that death or severe personal injury may result if proper precautions are not taken.

ACAUTION

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be adhered to. The information in the relevant documentation must be observed.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Overview of the most important new and improved functions

1

An overview of the most important new and improved functions in SIMATIC PCS 7 V7.1 compared to PCS 7 V6.1 is given below.

New as of PCS 7 V7.1 - Overview of highlights

- Maintenance client possible on any OS clients
- Library blocks of the "Advanced Process Library (APL)" available
- SIMATIC PDM architecture has been changed over. Information on devices that were configured with SIMATIC PDM are also available on Maintenance clients in process mode.
- PCS 7 supports telecontrol for remote terminal units

New as of PCS 7 V7.0 SP1 - Overview of Highlights

- Engineering
 - Chart-based multiuser engineering allows you to use several engineering stations to edit the charts of an AS.
 - A library has been implemented for "Advanced Process Control (APC)" functions.
- SIMATIC PCS 7 BOX RTX is a BOX PC with an integrated software-based AS. Bundles are available with ES/OS/AS or OS/AS.
- SIMATIC PCS 7 AS RTX is a software-based AS:
- The PCS 7 Toolset DVD is available in the following language versions:
 - German / English / French
 - Chinese / English

New since PCS 7 V7.0 - Overview of Highlights

- Intelligent alarm management for relieving operating staff
- Improved support for tracking changes (change log), access control and tracking (conforming FDA requirements)
- Version Cross Manager for easy version comparison of any archived single projects or multiprojects
- Redundant terminal and plant bus based on switches from the SCALANCE X product series
- Coupling of redundant OS servers via ETHERNET (only serial up to now), for distances of up to 1000 m
- Configuration of an industrial WLAN with modules and components from the SCALANCE W product series
- Effective archiving with central archive server (CAS)
- PROFIBUS PA architecture with high availability: Ring architecture and line architecture with coupler redundancy
- Support for FF devices downstream from a DP/FF ink (FF = Foundation Fieldbus)
- Expanded integration of SIMATIC BATCH and SIMATIC Route Control, combined with additional functions
- Safety design for PCS 7 with recommendations and information for configuring networks
- OPC-based OpenPCS 7 system interface for process data evaluation and process data management
- Standard automation systems with more working memory for increased performance, reduced processing time
- The menus for configuration and for process management can be displayed in the following languages depending on the installation:
 - Chinese
 - German
 - English
 - French
 - Italian
 - Spanish

Automation systems (AS bundles)

2

New as of PCS 7 V7.0 SP1

SIMATIC PCS 7 AS RTX

SIMATIC PCS 7 AS RTX provides a WinLC RTX software PLC. The working memory of the SIMATIC PCS 7 AS RTX can handle automation programs requiring up to 11.2 MB of memory. You connect the distributed I/O via the integrated CP 5611 PROFIBUS DP interface.

Fault-tolerant and failsafe AS

New CPU types available:

- All AS bundles are equipped with more, faster working memory
- Up to 3000 process objects can be configured in an AS
- Firmware update of the central engineering system via plant bus Industrial Ethernet
- Firmware update can be performed with redundant operation of the CPU during runtime.
- Display of performance data of the AS and stop avoidance with CPU overload. The CPU_RT block determines the runtime of the individual OBs and their participation in the cycle time. Users can configure the limits of actions to be performed for stop avoidance when the CPU of an AS experiences overload (OB 80, cycle time exceeded) to ensure the AS remains operable.
- CPU SIMATIC S7 412-3H/F available for small plants, e.g. for modularly configured failsafe controllers for ESD (Emergency Shutdown System) and burner management

F Systems V6.0

- Additional blocks for QUADLOG
- Improved design for integrating DP and PROFIsafe PA slaves
- Value display for bypass and simulation
- Enhanced selection blocks (1v2, 2v3)
- Secure communication blocks for Distributed Safety
- Improved evaluation options for errors detected by the failsafe system

Standard automation systems

- New, more powerful CPUs with 1.5 x (AS 417) or 2 x (AS 414/AS 416) more working memory and 25% to 40% less processing time
- System spectrum increased by two automation systems, AS 414-3IE and AS 416-3IE, in which the Industrial Ethernet connection is integrated in the CPU.
 These automation systems are less expensive than the comparable AS 414-3 and AS 416-3 but deliver the same performance.
- The firmware of the standard automation systems can be updated with two methods:
 - Via a flash EPROM memory card (8 MB)
 - Via the central engineering system via plant bus Industrial Ethernet
- Display of performance data of the AS and modified characteristics for CPU overload.
 The CPU_RT block determines the runtime of the individual OBs and their participation in the cycle time. Users can configure the limits of actions to be performed when the CPU of an AS experiences overload (OB 80, cycle time exceeded) to ensure the AS remains operable.

Distributed I/O system

3

New as of PCS 7 V7.0 SP1

ET 200M

- Interface module IM (MLFB 153-2BA02)
 - Use in HART modules
 - 12 modules/racks

Module 8 AI / 8 AO 0/4-20 mA HART

- Redundant configuration possible
- Firmware update
- 4 HART variables/channels
- 8 HART variables/channels

• F-DI24 & new IM153-2 HF

- Full integration of messages in the PCS 7 messages
- 12 modules/racks

ET 200pro

• Selected I/O available based on ET 200pro

You can find the components of the distributed I/O system that can be used with SIMATIC PCS 7 in the documentation *Process Control System PCS 7; PCS 7 Released Modules*.

You will find this documentation on the PCS 7 Toolset DVD or, following the installation of PCS 7, with the menu command **Start > SIMATIC > Documentation > English >** PCS 7 Released Modules:

ET 200M

The new IM 153-2 interface modules provides functions of the IM 157 (interface module in DP/PA-Link, Y-Link). The following improvements have been implemented:

- Automatic detection of the implementation type (ET 200M, DP/PA-Link, Y-Link)
- Connection of redundant PROFIBUS PA
- Faster failsafe IO reaction times (failsafe peer-to-peer)
- Increased accuracy of time stamping for I/O signals to 1 ms
- Improved connection for HART sensors

ET 200iSP

- Electronic module spectrum increased by three new digital output modules with external actuator cutoff via low signal, including wire break monitoring (L cutoff)
- Three previously offered digital output modules with actuator cutoff via high signal (H cutoff) replaced with successor modules that are replacement part compatible
- Power supply with external actuator cutoff via a new watchdog module with failure monitoring; separation of intrinsically safe power circuit per relay
- In addition to ATEX, now also certified for potentially explosive atmospheres for FM (cFMus), UL (cULus Hazloc) and IECEx (IECEx scheme)

See also

List of modules/component released for SIMATIC PCS 7

http://support.automation.siemens.com/WW/view/en/34412568

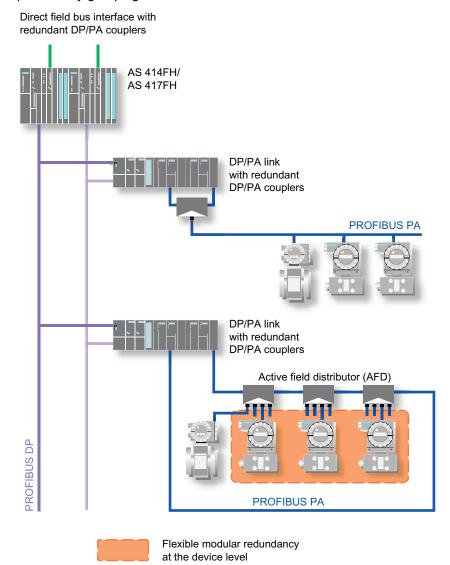
Fieldbus communication via PROFIBUS

4

New since PCS 7 V7.0

Flexible Modular Redundancy (FMR) from the automation system through to the PROFIBUS PA field device: Increased plant availability with new PROFIBUS architectures for environments up to hazardous zone 2, based on the FDC 157-0 DP/PA coupler with integral diagnostic slave function and active field splitters (AFS) and active field distributors (AFD):

 Line architecture with coupler redundancy: The AFS connects a PROFIBUS PA line with two FDC 157-0 DP/PA couplers of a DP/PA gateway. This gateway can be operating on a single or redundant PROFIBUS DP. The AFS switches the PROFIBUS PA line to the active coupler of the redundant pair. PROFIsafe communication is also supported. On the device level, FMR is made possible by grouping individual devices in different PROFIBUS PA lines. Ring architecture: AFDs integrate PROFIBUS PA Field devices via four short-circuit-proof spur line connection in a PROFIBUS PA ring with automatic bus termination. The PROFIBUS PA ring is connected via two FDC 157-0 DP/PA couplers of a DP/PA gateways with a single or redundant PROFIBUS DP. Up to 8 AFDs can be configured per ring. PROFIsafe communication is also supported. On the device level, FMR is made possible by grouping individual devices in different AFDs.



Highlights of the PROFIBUS PA ring architecture

- Increased availability with ring topology
- Safety-related and fault-tolerant applications with less work for devices and cabling
- Active bus connections for automatic bus termination integrated in the FDC 157-0 DP/PA coupler and in AFD enable:
 - Automatic, bumpless isolation of defective segment parts with short-circuit or wire break
 - Change can be made to the ring configuration and instrumentation in runtime, including the additional or removal of ring segments
- Transparent redundancy management of the intelligent FDC 157-0 DP/PA coupler for higher-level system
- Diagnostic and status information displayed per LED and also registered with PROFIBUS diagnostics, displayed on the operator system and maintenance station
- FDC 157-0 DP/PA coupler configured as PROFIBUS diagnostics slave supply comprehensive diagnostic and status information via PROFIBUS for fast error localization and correction, for example:
 - Current and voltage values on the main line
 - Redundancy status
 - Wire break
 - Short-circuit
- Integration of the FDC 157-0 DP/PA coupler in the device management with SIMATIC PDM and SIMATIC PCS 7 Asset Management

FOUNDATION Fieldbus integration

The gateways between PROFIBUS DP and FOUNDATION Fieldbus H1 (FF-H1) is realized with the DP/FF-Link bundle, consisting of the following components:

- Anybus DP-Link for connecting to PROFIBUS DP
- Fieldbus interface module FIM3420 with integrated supply (Power Conditioner) for coupling 4 FF-H1 segments
- Module limits:
 - Max. 16 DP/FF links per PROFIBUS DP line
 - Max. 64 FF devices per DP/FF link distributed over a maximum of 4 FF-H1 segments each with up to 16 FF devices; this allows up to 8 digital inputs, 8 digital outputs, 32 analog inputs and 16 analog outputs.
- Cyclic and acyclic communication
- Centralized engineering of the DP/FF link and FF field devices:
 - HW Config configuration of the Anybus DP-Link on the PROFIBUS DP master system
 - Web interface configuration of the FF field devices and the input/output data mapping via Ethernet connection with the FIM 3420
- DP/FF-Link and FF field devices supply cyclic diagnostic information.
- DP/FF-Link and FF field devices can be included in the SIMATIC PCS 7 Asset Management.
- "Control in the Field" supported.

Engineering System - What's New?

New as of PCS 7 V7.1

- Advanced Process Library
 - Industry and region-specific functions
 - Ergonomic and task-oriented faceplates
 - Uniform representation of status information
 - Standardized operator functions (Auto, On, Manual, Local, Out of operation)
 - Flexible cascadable interlocks
 - Note view
 - Adaptable and scalable functionalities
 - Modular functions (e.g. integration or use of auxiliary values)
 - Integration of maintenance functions
 - Simulation of values in process mode via operator station
 - Signal flow with structured variables
 - Integrated APC library from PCS 7 V7.0 SP1
- Simulation of fixed values (Forcing)
 - Signal values can be simulated in the CFC online view and in the process object view.
 Signal values simulated in this way are highlighted in the CFC online view.
 - The operator receives a corresponding message when signal values are simulated via the "Forcing" function.
- CFC configuration
 - Communication connections between automation systems can be configured using Drag&Drop.
 - Automatic versioning of CFC charts
 - Write protection for CFC charts
- SFC configuration
 - Automatic versioning of SFC charts
 - Write protection for SFC charts
- SFC visualization
 - "Block contacts" view (SFV) for an SFC instance faceplate
 The name, block type and status can be displayed for block contacts.

- Import/Export Assistant
 - The Import/Export Assistant can automatically close textual references.
 - The export file contains all the information from the current tab
- Data exchange in the Version Cross Manager
 - Hardware configuration (HW Config) incorporated as XML data
 - Export and import of created CFC charts
 - The "Differences only" view has been implemented.
- Version Trail supports FDA functionality with both access protection and the change log activated, the protected actions of the VT are logged with a time stamp.
- With high-precision time stamping of signals detected with a redundant setup, one
 message is sent in the case of a signal change when you use the PCS 7 V7.1 Library or
 Advanced Process Library blocks.
 - The message configuration is retained when software is updated for the new blocks.
- Expansion of graphics tools
- New views for trend control, table control and alarm control
- Media control
- SIMATIC PDM has been changed over to server-client functionality. Using diagnostic clients, you can access detailed information about devices and signals configured with SIMATIC PDM.
- Maintenance station
 Diagnostic settings can be migrated when updating software by means of an option in the plant hierarchy.

New as of PCS 7 V7.0 SP1

- Additional functions in the Version Cross Manager (VXM)
 - Importing of project and planning data with the Version Cross Manager
 - Generation of process tags
- Multiuser engineering Improvements have been made in the CFC for multiuser engineering. They allow multiple users to simultaneously edit a variety of charts stored in the same chart folder. You can
 - users to simultaneously edit a variety of charts stored in the same chart folder. You can find more detailed information about this in the CFC documentation under "Configuring in the network system".
- The checking of the PO licenses for the AS that was not activated in PCS 7 V7.0 is not activated in PCS 7 V7.0 SP1.
- "Advanced Process Control (APC)" library for advanced controller functions
 The APC library for advanced controller functions is included in PCS 7. It contains
 standard functions, special faceplates and the following special functions:
 - Multi-variable control in the AS (Model Predictive Control (MPC))
 - Monitoring for the performance of control loops (Control Performance Monitoring)
 - Controlled parameter adaptation of PID controllers (Gain Scheduling)
- Using updated blocks
 - The channel blocks have been updated in PCS 7 with the introduction of version V7.0 and the maintenance station expansion within SIMATIC PCS 7. In the channel blocks of version 6.x it was not possible to output a faulty process value with the associated "quality code" at the block or to realize a failure in conformity to the recommendation NE 107 on the OS. The following states were displayed when a process value failed:
 - * Simulation (corresponds to a manipulated process value)
 - * Substitute value (corresponds to a manipulated process value)
 - These state are displayed clearly and legibly with the new channel blocks. The preset characteristics have also changed due to the adapted functionality; with the PCS 7 V7.0 library when a signal fails without a project-specific preset, the process value is displayed on the OS as failed with the value and the quality code.
 - Please note this when upgrading the process control system to version 7.x.

Smart alarm hiding

A considerable proportion of all the messages (interrupts) that occur have no effect on the reliable and fault-free operation of the process control system, so they do not have to be followed up. As of V7.0, SIMATIC PCS 7 relieves the operating staff with strategies for hiding messages on the operator station (messages irrelevant to the operator). All messages (even those that are hidden) are still logged and archived. The following strategies are employed for hiding messages in PCS 7:

Automatic hiding

Messages are hidden (visually and acoustically) according to the configured settings. This is controlled by the process.

- Grouping of messages by subsystem; up to 32 operating states can be assigned, e.g. approach, service, etc.
- Definition of the settings for hiding the messages in the process object view or in an exported CSV file (with Microsoft Excel, regardless of the engineering system).
- The majority of irrelevant messages can be hidden in this way.

Manual hiding

Hiding of messages (both visually and acoustically) on the operator station, e.g. in the event of chatter messages resulting from an encoder fault

 Once a configurable time has elapsed, manually-hidden messages are shown again as a reminder.

Implementation of FDA requirements

Integration of SIMATIC logon for user administration and access control in PCS 7:

- Extension of the options for recording change reports in the change log:
 - recording all online changes concerning the automation systems, operator systems, SIMATIC BATCH and Route Control
 - Recording of access to the engineering system
- Analysis of the change reports in combination with SIMATIC logon makes it possible to identify which changes were made (who, what, when).

Version Cross Manager

Convenient version comparison for any archived single projects or multiprojects in SIMATIC PCS 7

- Clear, two-part representation with the differences highlighted in color
- Comparison of the hardware configuration, communication, plant hierarchy, block types, CFC/SFC, SFC details, global tags
- Clear hierarchical structure based on the plant hierarchy
- The entire project can be compared with other project versions.

SIMATIC PDM PCS 7

For additional information about SIMATIC PDM, see ST PCS 7 catalog, 09/2007.

Operator station - what's new?

You can find comprehensive information on the following topics in the *WinCC Information System* online help; the *Process Control System PCS 7, Operator Station* manual, and in the *Process Control System PCS 7, OS Process Control* manual.

New as of PCS 7 V7.1

Screen formats

In addition, the following screen formats are supported (16:10 formats):

- 1680 x 1050
- 1920 x 1200
- 2560 x 1600

Trend control

- Scroll and zoom function
- Background grid
- New functions for scaling the Y-axis
- Several trend controls in one process picture (operating screen)
- Parallel display of predefined values
- · Expansion of statistical functions
- · Option to export statistical data

Alarm control

- User-configurable status display
- Alarm status and information text displayed as icons in the alarm bar
- More than 1000 alarms can be displayed on one alarm screen
- Customized, easy-operation filter (as in EXCEL)
- Storage of settings
- Option to export selected data as a CSV file

WebNavigator client and WebNavigator diagnostic client

- The time for automatic logout can be adjusted
- "Monitor only" user permission available

OpenPCS 7

- OpenPCS 7 on OS client, OS server, OS single user system, central archive server
- OpenPCS 7 replaces @PCS 7

Layout of user interface/design

You can define the appearance of the user interface in process mode.

User-defined message filters

Users can define message filters in process control. Users can define process-specific content of the message window by setting corresponding message filters.

New as of PCS 7 V7.0 SP1

Languages

The PCS 7 Toolset DVD is available in Chinese/English versions:

Central archive server

• You can configure the central archive server redundantly.

Online trend control

- In the engineering project, you set the values to be displayed for the value axis of the
 online trend control in the process control. You need to download the new values to the
 OS. Parameter changes are applied automatically. Set the following values:
 - Measuring range start (display range start)
 - Measuring range end (display range end)
 - Unit
- New "zoom in" key functions"
 When zooming in, the 50% value of the trend is in the middle of the value axis. The zoom factor has been increased.
- New "zoom out" key functions"
 When zooming out, the 50% value of the trend is in the middle of the value axis. The zoom factor has been decreased.
- New "relative scale" key function
 Use this key function to switch the display of the absolute values to percentages in the
 value axis. The low limit corresponds to 0% and the high limit to 100% of the configured
 range between the minimum and maximum value (engineering project).
- Capacity increased to 150,000 process objects

Intelligent alarm management for hiding irrelevant messages

For details, see "Engineering station - what's new? (Page 15)"

Archiving in combination with the central archive server

- Circular buffer archive (512 variables) for short-term archiving ion OS single station and OS server, expandable to a maximum of 10,000 variables
- Combination of circular buffer archive and the long-term archiving of the central archive server (CAS)
- Centralized management of archive licenses on the CAS.
- The following applies when a CAS is integrated in the plant configuration:
 - 1,500 variables are already available with the CAS basic package. 512 variables are then reduced on the OS stations (single station and server).
 - All licenses for archive variables are installed on the CAS. The OS stations book their needs from this "remote". This saves having to install archive licenses on every single OS station.
- The variables of the SIMATIC PCS 7 Archive V7.0 are cumulated with the variables already available within the following configuration limits ("license key type: countable"):
 - Configuration limit for short-term archiving: 10,000 variables
 - Configuration limit for short-term archiving combined with long-term archiving via CAS: 120,000 variables
- The lowest cumulative number in this case is 1,500 variables.
- SIMATIC PCS 7 V7.0 supports a central archive server for storing and managing process values, messages and reports from up to 11 servers / server pairs.
- The CAS can archive up to 10,000 process values.
- All data can be saved to commercially available storage media and manually burned to DVD, for example.
- Process values and messages of the CAS can be visualized on the OS client.

Archiving in combination with StoragePlus

- Circular buffer archive (512 variables) for short-term archiving ion OS single station and OS server, expandable to a maximum of 10,000 variables
- Combination of circular buffer archive with StoragePlus long-term archiving for data from up to four single stations, servers or server pairs (1,000 process values each)
- Long-term archiving of process data (messages, measured values, reports and batch data) and cataloging (accounting)
- Visualization of archived data via Internet Explorer, independent from OS single station or OS client; user interface and functions identical to DataView from WinCC

OS Web functions

The operation and monitoring of a SIMATIC PCS 7 plant can also be performed via an intranet or Internet. The following operating mode are available for configuring Web operation:

- Standard mode: Up to fifty Web clients access the data of a SIMATIC PCS 7 Web server.
- Diagnostic mode: up to three Web clients access to up to three OS Web diagnostics servers / single-station systems for performing remote control, diagnostics or monitoring.

Maintenance station - what's new?

Maintenance client (MS client)

Every OS client can be used as an MS client.

Display of release for maintenance

In the process control, the operator can issue the release for maintenance (e.g. for a motor requiring repair) in the faceplate of a component.

Filtered complete export

You can use this function on the maintenance station for exporting ID data from all components that can be diagnosed (e.g. field devices, AS components, network components).

Operation on WebNavigator client/WebNavigator diagnostics client

Comprehensive actions can be carried out on the automatically generated diagnostics and maintenance screens.

WinCC "Alarm Control Center" add-on:

The WinCC "Alarm Control Center (ACC)" add-on can process data created by an individual export operation relating to a component.

Hardware/software configurations

The following table shows the possible hardware and software configurations for the maintenance station.

You can find the software requirements and versions in the PCS 7 Readme documentation on the PCS 7 Toolset DVD.

Required PCS 7	d PCS 7 multiple station s		PCS 7 ES	PCS 7 Box			
hardware/software	MS server	ES/MS client	Single station				
Required SIMATIC PCS 7 basic hardware							
SIMATIC PCS 7 BOX, complete system (Windows XP operating system)				X			
SIMATIC PCS 7 ES/OS		X	X				
Windows XP Professional operating system including service packs							
BCE or Industrial Ethernet							
SIMATIC PCS 7 OS Server	Х						
Windows Server 2003 operating system including service packs							
BCE or Industrial Ethernet							
Required SIMATIC PCS 7 software corresponds to operating system of the basic hardware (without capacity limits)							
PCS 7 Engineering Software AS/OS		X	X	X			
SIMATIC PDM		Х	X	X			
PCS 7 OS Software Server	X						
PCS 7 Asset Engineering		Х	X	X			
PCS 7 Asset Runtime	Х	Х	X	X			

New as of PCS 7 V7.0 SP1

Displaying HTML pages of a network component

The maintenance station uses Web Based Management for accessing the configuration of the network components with an Internet browser. The network components must correspond to the OSM or SCALANCE device profile.

Exporting data of a network component

Data (such as ID data, alarm lists) of a network component can be exported from the associated faceplate in the "Maintenance" view using a command from a drop-down list.

Variable storage location for the complete export file

The storage location for the complete export file can be set in the engineering system. This storage location may be located on any network drive.

CPU emergency operation

Monitoring of the emergency operation of the with "high-priority messages"

Maintenance station

Additional "managed SCALANCE X" can be included in the diagnostics. You can find additional information on this in the documentation *Process Control System PCS 7;* Released Modules.

Maintenance functions and information are seamlessly integrated into SIMATIC PCS 7 in the form of the Maintenance Station (MS).

The Maintenance Station gives the maintenance engineer an overview of the diagnostic and service information for all assets, i.e. the system components of a plant. These include intelligent field devices, I/O modules, controllers, Fieldbus, terminal bus and plant bus components or operator stations.

The available detailed information is filtered and prepared according to the area of responsibility and the associated authorization.

The Maintenance Station uses ES/OS tools, user interfaces and hierarchies. The alarm logging, type of representation and user guidance are all based on the operator control and monitoring philosophy developed for operators. The diagnostic data for all assets are represented by uniform faceplates, the content of which is determined by the intelligence of the particular component.

The maintenance station can be implemented on the basis of SIMATIC PCS 7 BOX, a PCS 7 single station or a client/server combination, depending on the architecture of the PCS 7 plant.

Diagnostic screens and picture hierarchies are derived from the hardware/software project of the application and generated with a press of the button with the aid of the system.

Highlights of SIMATIC PCS 7 Asset Managements V7.0

- You can now also integrate non-intelligent assets such as pumps, motors, centrifuges or heat exchangers in the plant-floor asset management.
- Using the programmable "AssetMon" logic block, impermissible operating states can be detected from various process values and their deviations from a specified normal status, and displayed as maintenance alarms on the maintenance station.
 - "AssetMon" is integrated through an individual Electronic Device Description (EDD) and behaves like an intelligent field device.
 - "AssetMon" can process up to three analog values and up to 16 binary values.
 - Custom diagnostic structures can also be realized with their own diagnostic rules and condition monitoring functions.
- Configuration and parameter changes of EDD-based devices are detected and can be recorded, displayed and documented in the SIMATIC PDM change log.
- A central, automatically generated list with the ID data of all assets supports you in creating an optimal update strategy.
 - The list generated automatically per ID data export contains firmware and software revisions of all the components displayed on the maintenance station.
- CPU_RT block with "performance data" for selected CPUs

PC stations in PCS 7 - What's new?

8

New as of PCS 7 V7.0 SP1

New basis for bundle PCs

- Change to the PC basis for PCS 7 Industrial Workstations from IL43 to RACK 547B
- Change to the PC basis for PCS 7 BOX bundles from BOX 627 to BOX 627B
- "SIMATIC PCS 7 AS RTX" product based on MICROBOX 427B

SIMATIC PCS 7 BOX RTX product bundle

The hardware is based on BOX 627B. SIMATIC PCS 7 BOX RTX features WinLC RTX software PLC. SIMATIC PCS 7 BOX RTX features WinLC RTX software PLC. You connect the distributed I/O to SIMATIC PCS 7 BOX RTX via the CP 5613 PROFIBUS DP interface.

SIMATIC PCS 7 AS RTX product bundle

SIMATIC PCS 7 AS RTX is based on a MICROBOX 427B and provides WinLC RTX software PLC. The system is designed as an automation system and is connected directly to the plant bus (Ethernet) and loaded via the ES station. The AS RTX system is operated without rotating parts (flash disk and no hard disk). You connect the distributed I/O via the PROFIBUS DP CP 5611 interface integrated in the MICROBOX PC.

Additional information

- Manual Process Control System PCS 7; SIMATIC PCS 7 BOX.
- You can find additional information and technical data (on Dual Core technology, RAM configuration, etc.) in the file pcs7-readme.

SIMATIC PCS 7 BOX 416

SIMATIC PCS 7 BOX 416 is based on a SIMATIC industrial PC (Box PC 627) with WinAC slot CPU 416-2DP V4.0 installed:

- Operating system: Windows XP Professional SP2
- Can be used in stand-alone mode or as part of a larger system
- Configuration changes during operation (CiR) are possible, depending on which process I/Os are connected.
- OS-specific configuration changes can be made online on the SIMATIC PCS 7 BOX PC or central engineering system, i.e. without having to end the OS process in operation.
- SIMATIC PCS 7 BOX 416 is released for use as a maintenance station within SIMATIC PCS 7 Asset Management.
- SIMATIC PCS 7 BOX 416 is released for automating batch processes with SIMATIC BATCH (not supplied as standard). The release is limited to no more than 10 UNITs (instances of subsystems). Released SIMATIC BATCH product range:
 - Server Basic Package V7.0 for up to 10 UNITs
 - Batch Control Center V7.0
 - Recipe System V7.0
 - Batch Planning V7.0
 - Hierarchical Recipe V7.0
 - ROP Library V7.0
 - Separation Procedures/Formulas V7.0
- SIMATIC PCS 7 BOX 416 is available in the form of two product bundles:
 - as a pre-installed complete SIMATIC PCS 7 system with AS, ES and OS functionality, including AS/OS engineering and runtime licenses for 250 process objects (PO)
 - as a pre-installed SIMATIC PCS 7 runtime system with AS and OS functionality, including AS/OS runtime licenses for 250 POs
- The product bundles can be upgraded with SIMATIC PCS 7 PowerPacks/Runtime licenses for up to 2000 POs.
 - PowerPack engineering software AS/OS for complete system
 - PowerPack OS Software Single Station and AS Runtime License for runtime system

Note

AS runtime licenses can be cumulated with existing process objects. The number and type (100 or 1000) of additional runtime licenses is insignificant.

USB smart card reader

The USB chip card OMNIKEY CardMan 3121 USB is enabled for PCS 7.

SIMATIC BATCH - What's new?

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New as of PCS 7 V7.1

Save recipe

You can save the control recipe for every batch, regardless of whether or not it has been modified in OSC processing mode, using the function "Save recipe as". It is saved in the "Master recipes" folder as a new master recipe with a new name (the default is the name of the batch). You will need to have been assigned the "Save as new recipe" right in order to use this function.

- Online structure changes (OSC)
 It is possible to change recipe structures in planned, enabled and started batches with SIMATIC BATCH V7.1 SP1. The adapted or changed recipe structure in the control recipe (batch) can be saved as a new master recipe and used again. This new function enables you to refine your master recipes in test mode and adapt them perfectly to your processes.
- SIMATIC BATCH report
 In SIMATIC BATCH V7.1 SP1, the SIMATIC BATCH report (SBReport) for displaying batch data in the BATCH Control Center is no longer supported and no longer installed automatically by SIMATIC BATCH Setup. Therefore, the menu command Start > SIMATIC > BATCH > SBReport is no longer available.
- In SIMATIC BATCH V7.1 SP1, the previous SIMATIC BATCH Report (SBReport) in HTML format is no longer supported and has been superseded by the Advanced Report. For additional information, refer to the SIMATIC BATCH documentation.

New as of PCS 7 V7.0 SP1

- Language setting of the BATCH server applications
 The language setting is set in the shortcut menu of the BATCH Launch Coordinator with
 the menu command "Server Language ...". The shortcut menu and the tooltip texts of all
 BATCH server applications (Batch Control Server, CDV (bfcdvx), SIMATIC BATCH
 Server and BATCH Launch Coordinator) are displayed in the selected language for the
 language setting. The newly set language is displayed after the BATCH Launch
 Coordinator is restarted.
- Visualization of the BATCH server status
 A new icon is shown in the status bar of your window for both BATCH clients (BCC and RE). It show the current status of the BATCH server. If you place the mouse pointer on the icon in the status bar, a window opens with detailed information about the status.
- Extended SIMATIC BATCH protocol
 In addition to the previous SB Report, an "extended protocol system" is available for
 SIMATIC BATCH as an add-on. Based on the standard software, Crystal Reports, you
 are provided with a high-performance application for designing protocols and message
 content and their print layout.

FDA and SIMATIC BATCH

SIMATIC BATCH fulfills the following FDA requirements for use by pharmaceutical manufacturers:

- ESIG information for all SIMATIC BATCH actions
- Audit trail for transition objects
- Operator dialog
- Use of full names (user name, ID)
- Time stamping and UTC conversion (universal coordinated time), time zone conversion
- Audit trail for all user actions
- Batch ID
- Forces commenting for manual actions
- Changes to header parameters are recorded in the audit trail.
- Deleting of batches without completion and archiving
 A new optional status transition is provided in SIMATIC BATCH. Deleting batches in the
 "Completed", "Aborted" or "Stopped" state is now possible and permitted without having
 them go through "Close" and "Archive".
- In the SIMATIC BATCH configuration dialog, you can select the language in which the messages are output in BATCH Report.
- Text entries for batches can be deleted before a batch is released.
- Specifying the start batch ID for the "Restore" command If you reset the SIMATIC BATCH database in a plant already in production using the "Restore" command, SIMATIC BATCH always specifies the ID=1 for the first batch. To reuse batch IDs not already assigned, you have the option of specifying a start batch ID in the "Open" dialog box when using the "Restore" command if you want to restore your BATCH data. The first batch created after the "Restore" command is triggered in the BATCH Control Center receives the start batch ID you have specified.
- Comment field for electronic signatures
 - You can now also force a comment for signing status transitions in process mode. This forces an operator, required by user role to enter an electronic signature, to enter a comment in the comment field of the "Sign" dialog in addition to the electronic signature. Only then can the operator close the dialog using the "OK" button.

- You can use arithmetic expressions to calculate setpoint values from recipe tags and constants in transition and recipe parameters.
 - The recipe author has access to a user-friendly formula editor for this purpose.
 - The formula editor is able to combine recipe tags or constants using the four basic logic operations.
- Extended cooperation with SIMATIC Route Control:
 - In SIMATIC Manager, defined plant locations for transporting materials can also be exported to SIMATIC BATCH.
 - When you create recipes with the recipe editor, you can then assign the transport phases using the allocated route control blocks to certain plant locations as transfer parameters (source, target or via).
- System-supported version control of recipes, formulae and library objects makes validating plants much easier.
- Each user can store their own system settings, e.g. user interface, windows or language, which means they can work in a familiar environment on any client.
- In the recipe editor and the BATCH control center (excluding alarm windows), a change of language takes immediate effect, i.e. even before the current application is exited.
- Text variables and fixed texts (strings) can be compared during transitions.
- Product names can be stored in formulae.

OpenPCS 7 for analyzing and managing process data

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New as of PCS 7 V7.0 SP1

OPC A&E server

The OPC A&E server now supports the new mapping "with hierarchical access" and reading of archived messages in addition to the previous mapping of the WinCC message system for OPC Alarms&Events. Use an OPC A&E server with hierarchical access when creating new projects.

Note

Software update of an OPC A&E server

If you update an existing project, the OPC A&E server can be used as before or the OPC A&E server can be converted to hierarchical access. You can undo the changeover without losing any data.

Further information can be found in the following documents:

- Process Control System PCS 7, OPC A&E for PCS 7 (V7.1)
- SIMATIC HMI; WinCC V6.2 SP2; Release Notes

New since PCS 7 V7.0

An OpenPCS 7 allows you to make process data from SIMATIC PCS 7 V7.0 available even to higher-level systems for production planning and for analyzing and managing process data.

The OpenPCS 7 interface is based on the OPC specifications (Openness, Productivity, Collaboration) which primarily use Microsoft's DC technology (Distributed Component Object Model) for communication between the applications.

The OpenPCS 7 interface supports the following OPC access standards:

- OPC HDA: OPC Historical Data Access for read access to archived process data
- OPC A&E: OPC Alarm & Events for read access to current interrupts and messages
- OPC DA: Data access for exchanging instantaneous values

The OpenPCS 7 server collects the data that is needed on the OPC clients from OS servers or the central archive server. Possible OPC clients include:

- OPC HDA clients, e.g. reporting tools, which can request specific historical data by specifying the start and end of a time interval.
- OPC A&E clients at the production and company management level receive the messages together with all associated process values from the OPC A&E server according to their subscription. Filter mechanisms limit the data transfer to selected, modified data.
- OPC DA: Data Access for exchanging instantaneous values

The following configurations are possible for OpenPCS 7 servers:

- As a multifunctional SIMATIC PCS 7 industrial workstation, client type, with OpenPCS server and OS client functionality (OpenPCS 7 server/OS client)
- As a stand-alone OpenPCS 7 server based on a SIMATIC PCS 7 industrial workstation, client type (preferred configuration)

SIMATIC Route Control - What's new?

New as of PCS 7 V7.0 SP1

 SIMATIC Route Control now supports Chinese as an operator language in addition to German, English, French, Italian and Spanish.

The documentation is available in the following languages:

- Chinese
- German
- English
- French
- A "Getting Started" is available in German and English to familiarize users to the configuration of Route Control based on an example project.
- You can use SIMATIC PCS 7 BOX 416 for Route Control. As of PCS 7 V7.0 SP1, the Route Control wizard can create S7 connections between two applications of PC station.
- Using the "Options" menu in the SIMATIC Manager, you can export all node points of a PCS 7 project together with hierarchy folders and units to a CSV file and import them in the SIMATIC Manager after editing them with external tools.
- Operation times and error tolerance times can be deactivated.
- Through the OOSREQUP input at the RC_IF_CFG block, a user program can request the "AS in maintenance" (out of service) state.
 You can enable or disable this "maintenance request per program" in the maintenance view of the Route Control Center.
- A new control is provided in the Graphics Designer for integration in plant pictures. It
 allows you to select a node point in runtime from a drop-down list. The control supplies
 the ID of the selected node point, for example, for supplying the input of a route block.
- The automation systems are now displayed in Route Control Engineering in such a way that their association to a multiproject and project can be recognized. The run time parameters have been distributed to subdirectories.
- When a partial route is added, the system now suggest a name derived from the name of the source and the destination. The names of the source and destination are derived from the name of the unit and node point.
- The interface of the "offline route search" has been redesigned.
 The program uses a faster search algorithm.
- The startup characteristics of redundantly configured servers has been improved.
- The drop-down list in the Route Control Center, from which you select either the source, destination or via of a route, now only offers the node points of the type to be selected. Note: The full node point name is shown in the Route Control Center (previously: only in the tooltip)

- When you select a route in the Route Control Center, you will see a new "Partial Routes" tab with information about the partial routes involved in this route.
- In the Route Control faceplate you can now see the names of the source, destination and vias in the form "Plant \ Unit \ Node Point".
 This name is unique throughout the entire PCS 7 project.

New since PCS 7 V7.0

- Locations that mark the start and end of a partial route and thus the source and target of a material movement are now configured as "equipment properties of a subsystem" in SIMATIC Manager, rather than with the Route Control engineering tool as before. The RC wizard transfers the locations to the RC engineering project.
- Advantages of central engineering in SIMATIC Manager:
 - Central data storage and direct allocation of locations to the plant hierarchy/plant is possible.
 - Harmonized labels across the entire project
 - FDA-compliant recording of all modifications in the change log
 - Use of locations even in SIMATIC BATCH and SIMATIC Route Control (no more double configuration required)
- Engineering view is now even easier to use as it is more like the runtime view:
 - The function properties are shown horizontally in a matrix, while the elements of the partial route run vertically.
 - Activation is configured at the intersection between element and function property.
- Generic user elements can be used to create complex user objects or special blocks which can be handled like standard RC elements. Several objects should be interconnected, transferred to RC engineering and then integrated into partial routes. These are activated and analyzed at runtime.
 - The package includes

- STL and SCL sources

- CFC examples
- A new features is the option for saving the settings for route properties for manual
 material transport as a route template under a name defined by the user. Since these
 templates can be opened and modified or used again at any point in time, the time it
 takes to configure manual material transfers has been reduced considerably.
- The download of the RC project to the RC server is recorded in the change log and can therefore be traced.

Industrial Security 12

New as of PCS 7 V7.1

Whitepaper documentation newly available on the Internet SIMATIC; Security Concept PCS 7 and WinCC - basic document

The "Security Concept PCS 7 and WinCC" is a collection of documents consisting of several parts.

The basic document is intended to serve as a central guide and provides an overview of the general basic principles of the security concept and possible approaches to problems. The basic principles of the security concept outlined in the basic document must be regarded as a whole. All additional detail documents assume the reader has read the basic document.

Structure of basic document:

- Information for understanding the security concept
- Security strategies and their basic principles
- Implementation of the security strategies for security solutions and references to specialized detail documents
- The detail documents explore specific solutions and their recommended configuration in detailed form, always focusing on a particular topic or product.

Information on the "Security Concept PCS 7 and WinCC" collection of documents can be found on the Internet at the following address: (http://support.automation.siemens.com/WW/view/en/28580051)

New since PCS 7 V7.0

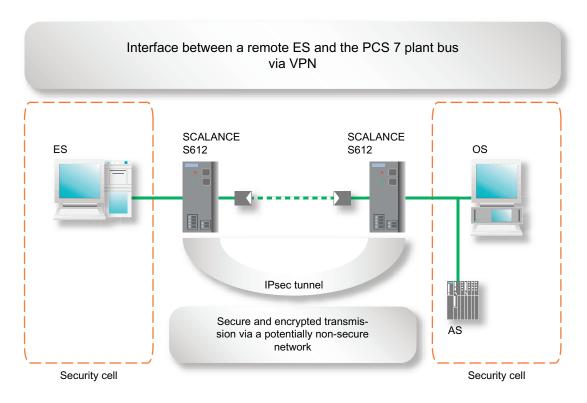
With its trail-blazing security concept, SIMATIC PCS 7 offers comprehensive solutions for protecting a processing plant based on a defense in depth security architecture. The special feature of this concept is its holistic approach. It is not simply limited to the use of individual security methods (such as encryption) or devices (e.g. firewalls). Rather its strengths lie in the interaction between a number of security measures in the interconnected system. The security concept is documented in detail in the "PCS 7 Process Control System; PCS 7 Security Concept, Recommendations and Information (http://support.automation.siemens.com/WW/view/en/22229786)" manual, which contains guidelines and recommendations on the following topics:

- Formation of a network architecture with nested security, combined with segmentation of the plant into security cells
- Network administration with name resolution, assignment of IP addresses as well as division into subnets
- Operating plants in Windows domains (Active Directory)
- Managing Windows user permissions and the SIMATIC PCS 7 operator permissions;
 Integration of SIMATIC PCS 7 operator permissions in the Windows management system
- Reliable mastery of time synchronization in the Windows network
- Patch management for Microsoft products
- · Using virus scanners and firewalls
- Support and remote access (VPN, IPSec)

New features relating to industrial security in SIMATIC PCS 7 V7.0:

- Simatic Security Control (SSC): During setup, the security-relevant parameters of DCOM, registry and Windows firewall are set automatically.
- The current versions of the following virus scanners have been approved: TREND MICRO OfficeScan, Symantec Norton AntiVirus and McAfee Virusscan
- Windows Firewall approval
- The following security components of SIMATIC NET have been approved:
 - Industrial Security Module SCALANCE S602 with Firewall functionality
 - Industrial Security Module SCALANCE S612 with Firewall functionality and VPN (Virtual Private Network) functionality for up to 32 devices (up to 64 simultaneous VPN tunnels)
 - Industrial Security Module SCALANCE S613 with Firewall functionality and VPN (Virtual Private Network) functionality for up to 64 devices (up to 128 simultaneous VPN tunnels); suitable for extended temperature range of -20 to +70° C

Example for implementation of SCALANCE S Industrial Security modules in SIMATIC PCS 7:



License Model for SIMATIC PCS 7

New as of PCS 7 V7.0 SP1

The checking of the PO licenses for the AS that was not activated in PCS 7 V7.0 is not activated in PCS 7 V7.0 SP1. With a project selected, it is possible to display the configured process objects under license in SIMATIC Manager (Menu command **Extras > PCS 7 license information**).

Additional information

Manual Process Control System PCS 7; PC Configuration and Authorizations

New since PCS 7 V7.0

With the introduction of SIMATIC PCS 7 V7.0, the licenses for ES, OS and AS also change.

The aims of the new licenses for ES, OS and AS are:

• Lower prices and simplification for engineering users

and

Simplified calculation unit
 Process objects (PO) known from the ES are now used as the calculation unit also for the
 OS (tag calculation was used previously) and AS (unit paper license was used
 previously). Process objects are all blocks used for operator control and monitoring and
 all signaling blocks without driver blocks. The plant scale price is now overwhelmingly
 formed by the process objects of the runtime system AS and OS. There are basically no
 capacity restrictions for pure engineering.

License changes for OS

 Instead of tags, process objects are now counted and charged for the OS. In addition, the sum of the tags used by the PO is checked, whereby up to 50 tags per PO are possible on the average. All tags not assigned to operator control and monitoring blocks, for example, manual or "external tags" created by the system, are converted into process objects with a divisor of 25 tags/PO.

License changes for AS

The process object model has been introduced for the runtime license of the SIMATIC PCS 7 automation systems (AS bundles).

- The volume-based AS runtime license is new. Similar to the OS, each signaling, operator control and monitoring block (except for driver blocks) running on an AS is counted and charged. One PO is calculated for an SFC. The AS runtime licenses are managed in the engineering system.
- Each complete system is combined with a SIMATIC PCS 7 AS runtime license for 100 process objects (PO).
- The number of process objects can be extended with additional runtime licenses for 100, 1000 or 10000 PO (for example, 100 PO +100 PO = 200 PO).
- To ensure trouble-free introduction of the new AS runtime licenses, the system will
 perform a license verification for a limit transition time. To prepare for the activation of the
 license verification, we recommend you keep licenses with a sufficient number of process
 objects on the engineering station, which is usually used for downloading to the
 automation systems.
- Existing AS runtime license documents (for example, "SIMATIC PCS 7, SOFTWARE RUNTIME LICENSE LIBRARY BLOCKS") can be exchanged for new AS runtime licenses (100 PO) for a period of one year. You will receive detailed information concerning this in a separate news article in the near future.

License changes for ES

 Depending on the application, an engineering station is either a combined ES/OS station for small applications or a classic engineering station, which is not suited as an operator system for production operation.

Classic engineering station with unlimited number of process objects (PO unlimited) in three variations:

- AS/OS: for AS and OS engineering
- OS: for OS engineering only
- AS: for AS engineering only

With the ES variation of OS and AS/OS, the OS configuration can be tested in a OS test mode limited to 2 hours. This OS test mode is not suited for production operation. When the 2 hours have expired, the ES switches automatically to demo mode. The ES variation of AS/OS is an especially attractive feature, which can be upgraded by including an AS runtime license for 600 PO.

Note

If the ES is also used for WinCC projects (SCADA engineering), all additional tags will continue to counted. The ES must be licensed for additional tags for this project. It continues to be subject to a volume limit.

Combined ES/OS station for small applications

To support compact, process control plants, three additional limited volume ES/OS combinations are offered with 250, 1,000 and 2,000 PO. These "all-in-one licenses" contain the runtime licenses for AS and OS with the corresponding volumes in addition to the engineering licenses. Power Packs with 250 to 1,000 PO, 1,000 to 2,000 PO and 2,000 PO to PO unlimited enable the capacity to be extended further.

SIMATIC Logon - What's new?

New as of PCS 7 V7.0 SP1

SIMATIC Logon requires no license key in PCS 7.

New since PCS 7 V7.0

SIMATIC Logon is integrated into PCS 7 in order to protect projects and subcomponents.

The license key for SIMATIC Logon is included with every software package for PCS 7 PC stations (reinstallation and updates).

Logon with smart cards

As of version V1.3, SIMATIC Logon uses improved encryption for smart cards. Describe all smart cards again that have been written with SIMATIC Logon prior to version V1.3. If a logon attempt fails with a smart card that has not been updated, you can logon using your user name and password.

System documentation - What's new?

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PCS 7 documentation is available as follows:

- In the PCS 7 manual collection
- After installing PCS 7, via the menu command Start > SIMATIC > Documentation > English > ...
- In the PCS 7 basic help for SIMATIC Manager Help > Contents ...

New as of PCS 7 V7.1

New documentation on the Toolset DVD and in the manual collection

- Process Control System PCS 7; Time Synchronization manual
- Process Control System PCS 7; OPC A&E for PCS 7 manual

Documents available on the Internet:

- Engineering compendium as "PCS 7 in practice" support:
 - Part A: Standard
 - Part B: Process Safety
 - Part C: Application Design
- Whitepaper SIMATIC; Security Concept PCS 7 and WinCC basic document

New as of PCS 7 V7.0

- The "SIMATIC Guide to Manuals" on the Internet (http://www.siemens.com/simatic-docu)
 will take you through the available technical documentation for the individual SIMATIC products and systems in the following languages:
 - Chinese
 - German
 - English
 - French
 - Italian
 - Spanish
- You can find practical examples in "German" and "English" following the installation of PCS 7 in the folder "Siemens_Step7\S7Manual\PCS7GS\":
 - You can find information on DP / FF in the document PCS7_V70_in-practice_DP_FF_Link_de (PDF)
 As a supplement, another document on DP / FF will be available on the customer support Web site at a later point in time.
 - PCS7_V70_in-practice_AlarmHiding_de (pdf)
 - PCS7_V70_in-practice_ASSET_de (pdf)
 - PCS7_V70_in-practise_CPU_RT_de (pdf)

Additional information 16

If new features of specific PCS 7 components are documented separately, you will find this information in the following files belonging to the software components:

- <Name of the component> What's New
- <Name of the component> Readme

These files can be found on the "PCS 7 Toolset DVD" in the install directories for the PCS 7 components.

Online documentation

In the online documentation you can find this information in the "What's New ...?" sections.

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