What's New in PCS 7 V6.0 incl. SP3?

This documentation explains the most important enhanced functions and modifications in SIMATIC PCS 7 Version 6.0 including SP3.

Inhalt

1 Overview of the Highlights

The following features have been incorporated in SIMATIC PCS 7 V6.0 including SP3:

- Integration of the new S7-400 CPU generation and the new interface modules for DP.
- Enhanced functions in the ES
- Enhanced functions for interfaces to MIS/MES
- Enhanced functions in the module spectrum such as counter modules FM350
- Introduction of the OS optional package StoragePlus for cost-effective long-term archiving of the OS and Batch data
- Introduction of SIMATIC PCS 7 BOX as PCS 7 version for getting started

2 Automation System - What's New?

- Innovative SIMATIC S7-400 CPUs
  - Support of the innovative new CPU generation with program execution times improved by a factor of 3.
  - The new CPUs will be released at almost the same time as SIMATIC PCS 7 V6.0 incl. SP3. Integration in STEP 7 V5.3 therefore requires the Hardware Support Package on the CD.

- CP443-1EX10 / EX11 with firmware version V2.3.
  The V2.3 operating system can be updated on both hardware components -EX10 and -EX11.

- SIMATIC PCS 7 BOX
  - Integration of the CPU 416-2 PCI in the hardware catalog
  - Integration of the CPU 416-2 PCI in the PCS 7 Wizard

3 Process I/O - What's New?

- The following new I/O modules have been integrated in PCS 7:

  ET 200M
  - DI 16x AC/DC 24-48V with single grouping: 6ES7 321-1CH00-0AA0
  - DI 16 with diagnostics and clocking: 6ES7 321-7BH01-0AB0
  - DO 16 with diagnostics: 6ES7 322-8BH01-0AB0
  - FM350-1 counter module: 6ES7 350-1AH03-0AE0
  - FM350-2 counter module: 6ES7 350-2AH00-0AE0
  - DI 16xDC24V: 6ES7 321-1BH10-0AA0
  - DI 16xDC48..120V: 6ES7 321-1CH20-0AA0
  - DO 16xDC24V/0,5A: 6ES7 322-1BH10-0AA0

- DO 8xDC48..120V: 6ES7 322-1CF00-0AA0
- DO 32x120-230V AC: 6ES7 322-1FL00-0AA0

ET 200S
- Power/expansion module PM-D F X1: 3RK1 903-3DA00
- Contact Multiplier F-CM: 3RK1 903-3CA00
- 2 AO U HF: 6ES7 135-4LB01-0AB0
- 2 AO I HF: 6ES7 135-4MB01-0AB0

- Updated versions for the released module spectrum.

4 Engineering Station - What's New?

- S7-H systems:
  The software for the enginnering of fault-tolerant automation systems (PCS 7 optional package H Systems) is integrated free of charge in the SIMATIC PCS 7 software as of SIMATIC PCS 7 V6.0 SP3.

- "Compile and Download Objects" dialog in the SIMATIC Manager:
  The hardware configurations and connections can be compiled and downloaded in the "Compile and Download Objects" dialog (to download the entire hardware configuration).
  - SIMATIC 400 stations: Compiling and downloading hardware and connections
  - SIMATIC PC stations: Compiling hardware and connections

- Change log:
  The essential functionality of the change log in conjunction with the logon mechanism in engineering is already included in V6.0 incl SP1. In SIMATIC PCS 7 V6.0 SP3, enhancements relating to SFC have been made.

- Display tooltip with the mouse pointer:
  If the mouser pointer is moved over an I/O or a cable in test mode, the current online value is displayed at 1 second intervals.

- SFC access to chart I/Os and structures:
  Up to and including V6.0, it was not possible to address chart I/Os or structures with actions and transitions. This problem has been eliminated in this version. The use of structure elements is possible in transitions.

- Blocks per runtime group / OB:
  If there are too many blocks, the SCL compiler can abort during compilation. To avoid this, a warning hs been introducted that indicates when more than 50 blocks are installed flat in an OB. The number 50 is the default and typically it is possible to compile without problems up to this number of blocks.

- More specific jumps:
  When jumps are made, the relevant block I/O is displayed as selected instead of the block.

- Automatic completion of interconnections for block contacts:
  Interconnections for block contacts are now completed automatically when closing a textual connection. The IEA always handles block contacts together as a group.

- Interconnecting in the overview display in the CFC Editor:
  Cross-sheet interconnections are also possible per mouse click within a chart partition.

- SFC-specific operator permissions:
  In addition to the operator permissions for SFCs that can be specified for the entire OS in SFC Visualization V6.0 (SFC charts and SFC instances), these permissions can now be configured for specific instances, in other words, for each individual SFC chart or SFC

instance.

- S88-PH also for process cells without SIMATIC BATCH:
  The folders of the PH can also be displayed as levels "process cell", "unit" and "equipment module" in compliance with the S88 standard without SIMATIC BATCH being installed. This supports interfacing to applications at the works management level (MIS - MES).

- PCS 7 Wizard:
  - S7-400 station with one H-CPU.
  - The Wizard allows you to create an S7-400 station with one H-CPU..

- Process object view:
  - Optimization of the memory assignment and execution time.
  - Display for SFC.
    In the process object view, SFC chart I/Os are also displayed in the "Parameters" and "Signals" tabs and the messages of SFC charts are shown in the "Messages" tab.
  - Filters in the "Select I/Os" dialog.
    A filter can be included to reduce the amount of data and therefore speed up opening the "Select I/Os" dialog.
  - Changing the "S7_edit" system attribute
    The "Select I/Os" dialog has a button "Default...", with which the "S7_edit" system attribute of the I/Os of all block instances can be changed to the default of the block type. Display of block I/Os in the process object view:
    In the "Select I/Os" dialog box, the "Default..." button can be used to select the I/Os of all block I/Os of all blocks as was set with the "S7_edit" system attribute for the corresponding I/Os of the block types in the project master data library. This allows projects created with blocks earlier than V6.0 to be adapted for editing in the process object view.

- Adopting process tags in the Import/Export Assistant:
  CFC charts that do not have an assignment to the process tag type can be assigned again during import if the relevant conditions are met.

- List of transferred user text libraries:
  In the compilation log of AS-OS Engineering, the compiled user text libraries are logged in the "Messages" section in a separate subsection ("Create user text libraries...").

- Interconnecting CFC blocks:
  Interconnecting CFC blocks with more than 160 I/Os is now possible. If there are more than 160 I/Os per interface page, these are made invisible. Since these interconnections are no longer visible, they can be viewed and interconnected using the "Interconnection" column.

5 Operator Station - What's New?

- New optional package StoragePlus V1.0
  The two-language software Software StoragePlus V1.0 (German/English) is suitable for use with SIMATIC PCS 7 as of V6.0 SP3. StoragePlus is used for long-term archiving of the various types of data from PCS 7 in a central data storage system. It is possible to manage measured values from the OS archives, OS reports, and Batch data of SIMATIC BATCH in StoragePlus. This data is available regardless of the status of the PCS 7 runtime systems. This allows all the data to be visualized clearly in the Internet Explorer. StoragePlus can also read in the data archived by Storage V5.2 and convert it to the data format of V6.0. The StoragePlus optional package can be installed on an OS client or on a separate PC.

- Connectivity Pack optional package
  Process values with short acquisition cycles are stored in the archive databases in

compressed form. With Connectivity Pack, licensed access to online values and archive data of a PCS 7 OS is possible over OPC and the OLE DB Provider.
The Connectivity Pack includes the following:

- Server OPC HDA 1.1 (Historical Data Access) for access to historical data of the OS archive system.
- Server OPC A&E 1.0 (Alarms & Events) for forwarding or acknowledging messages
- OLE DB Provider for direct access to the process value and message archives in the SQL Server database on the OS RT machine and on a long-term archive server.
- The "Archive Connector" tool for configuring the database access. This makes it possible to connect OS archive databases with the SQL Server and to disconnect them again. An overview of individual database segments is created. The Archive Connector can monitor folders and automatically link copied archives.
- Authorizations for OPC Server, OLE DB Provider and Microsoft OLE DB /ODBC

- Models of a project master data library can also contain pictures and reports. The following functions are supported:
  - Create new
  - Copy/move from one project or another library to the library
  - Copy/move within the library
  - Rename
  - Open for editing
  - Delete

- Higher resolution with graphics cards: Support of the multi VGA card for 4 monitors each with a maximum resolution of 1600 x 1200. The following monitor resolutions are supported:
  - 4 monitors next to each other (6400x1200)
  - 4 monitors one on top of the other (1600x4800)
  - 4 monitors as 2x2 matrix (3200x2400)

- Operation in runtime:
  - When a message is acknowledged, an operator message is generated with the acknowledging user entered in it.
  - Process picture enlargement / zooming:
    Process pictures can be enlarged using the mouse wheel or by dragging a section.
  - Panning:
    Displayed sections of process pictures can be moved with the mouse.

- Licensing:
  - The number of archive tags can be expanded with powerpacks to 1,500, 5,000, 30,0000 and 80,000 tags.

6 SIMATIC BATCH - What's New?

- BATCH Engineering in:
  - SIMATIC Manager: Improved multiproject engineering
  - BATCH Control Center: Integration of the assignment of the user roles to user groups (role management)
- Online BATCH Control Server: Reduction of the step change times of the Batch Control Server

7 SIMATIC Logon - What's New?

- Chipcard reader: Access rights assigned with a chipcard for various SIMATIC PCS 7 applications.
- The authorization for SIMATIC PCS 7 applications (SIMATIC Logon Admin Tool, CFC, SIMATIC BATCH and WinCC Runtime) is now possible with a chipcard.

8 License Management

- As of PCS 7 V6.0 incl. SP3, AuthorsW is no longer used and has been replaced by the new Automation License Manager. The Automation License Manager is used to handle license keys and the previous "authorizations".

9 SIMATIC PCS 7 BOX

- SIMATIC PCS 7 BOX is a complete process control system consisting of an engineering station (ES), operator station (OS) and automation system (AS). SIMATIC PCS 7 BOX provides a connection to the distributed I/ over the integrated AS based on the PCI card "CPU 416-2 PCI". SIMATIC PCS 7 BOX, allows cost-effective implementation of an independent process control system with all the necessary components and the standard software SIMATIC PCS 7 V6.0 SP3.
  SIMATIC PCS 7 BOX is designed specially for small systems and stand-alone stations (package units), such as agitators, mixers, or water preparation stations as a "single station variant". SIMATIC PCS 7 BOX is also a very attractive option with which newcomers can get started with SIMATIC PCS 7. It is also possible to use SIMATIC PCS 7 BOX with a distributed engineering station or to integrate SIMATIC PCS 7 BOX in an existing PCS 7 process control system.

What's New in PCS 7 V6.0?

With "Totally Integrated Automation" from Siemens, SIMATIC PCS 7 opens up new avenues for automation systems interconnected on an enterprise scale. "Whatsnew.wri" tells you about the highlights of version 6.0. Today, SIMATIC PCS 7 has already reached an extremely high degree of performance. In the new Version 6.0, the tried and tested functionality has been further expanded, the upper limit for scalability significantly raised, and vertical integration forced. As a result, SIMATIC PCS 7 is pushing forward into new performance dimensions both qualitatively and quantitatively.

Contents

1 Highlights

Version 6.0 of the SIMATIC PCS 7 process control system includes the following enhanced functions or modifications compared with the previous version V5.2:

- System-wide online modification - hardware - communication - PLC - OS - SIMATIC BATCH (configuration and functional modifications)
- One view of all aspects of process tags in PCS 7. In the new process object view, process tags can be edited directly without changing tools.
- Optimization of the engineering with emphasis on shortening the configuration procedures (eliminating waiting times, effective configuration with a larger team)

- Efficient engineering of large projects with several engineers working at the same time
- Significant increase in system capacity (numbers of tags, stations etc.):

Criterion	SIMATIC PCS 7 V5.x	SIMATIC PCS V6.0
Max. no. of OS servers/server pairs	6	12
Max. no. of clients per OS server/server pair	16	32
Number of process values that can be archived per second by the process control system server)	2400	10.000 (with archive server)
Process tags per plant	approx. 18000	approx. 60000
Process tags per OS server	approx. 3000	approx. 5000

- Innovation and full integration of SIMATIC BATCH
- Tool for managing PCS 7 users: SIMATIC Logon
- Increase in the overall performance
- Greater system immunity and resistance in process overload situations
- Improved usability
- New operating system for the engineering system, operator system and SIMATIC BATCH (change to MS Windows 2000)

2 Automation System - What's New?

- Configuration in Run (CiR)
- F-Stop does not mean a complete CPU stop
- Expansion and updating of the PCS 7 hardware spectrum
  For more detailed information, refer to the "Released Modules" documentation.
- Other modules can be upgraded with a firmware update
  You will find further information in the documentation on "Service Support and Diagnostics".
- Support of the latest IP/PC generation

3 Process I/O - What's New?

- ET 200S is supported with driver blocks for ET 200S PROFIsafe. In particular, use of the motor starters of the ET200 spectrum and fail-safe modules is possible.
- Release of the distributed I/O ET 200M and the DP/PA Link and DP/PA coupler for use in hazardous zone
- Module redundancy for selected AI, DI, and DO of the ET 200M distributed I/O station when using non-redundant sensors/actuators
- New uses for DP components (DP/PA- and Y-Link as DPV1 slave, DP diagnostic repeater)

4 Engineering Station - What's New?

- Process object view in the SIMATIC Manager - All aspects of process tags and process objects can be edited in one view completely without changing tools. (General settings, parameters, signals, messages, picture objects, archive tags)
- Process tags in the project library
  - Use of off-the-shelf and user-created process tag types
  - Import and export of process tag types and replicas
  - Process objects can be edited directly in tables
  - Convenient functions supported such as copy/paste, search/replace, undo, two-level filter, co-operation with MS Excel/MS Access (via the Windows clipboard)
- Multiproject engineering allows efficient, parallel configuration involving large teams of engineers with storage of the projects of a multiproject centrally on one server or on several PCs.
- Common dialog for compiling/downloading all changes in hardware, PLC software, OS software and SIMATIC BATCH in the project - following selection, compilation/download

runs automatically and optimized.

- The PCS 7 wizard can be used to create a multiproject. When creating a multiproject, a project and a master data library are created with the "Models" and "Process Tag Types" folders.
  - Either "single workstation system" or a "multiple workstation system" or a "redundant multiple workplace system" can be created with the WinCC and/or SIMATIC BATCH objects.
  - The storage location (path) for the project/multiproject can be freely selected.
- Branching and merging of projects from a technological perspective: Charts or units can be copied to another project and edited without loss of interconnections. When they are merged back into the original project, even textual interconnections can be closed at the touch of a button.
- Symbolic representation can be selected in the process picture per block in CFC or in the process object view (for example, Motor = pump; ventilator; etc.)
- Automatic correction of OS tags when renaming tags in the ES allows:
  - Renaming of blocks and charts already used in pictures, archives, and scripts
  - Copying and renaming of complete units with CFC/SFC charts and pictures
  - Result: The copied unit works including all the internal interconnections between the charts, between pictures and blocks, SFC Visualization...
- Automatic optimization of the block run sequence:
  One run-time group per chart, all blocks of a chart are assigned to a run-time group.
  - The run sequence of the blocks is optimized by the system based on the interconnections (option)
- SFC expansions:
  - Chart I/Os for SFC (SFC chart: predefined chart I/Os; SFC type (replacement for the SFC Control block): predefined and configurable chart I/Os)
  - New object "SFC type" - An SFC type can be placed in a CFC chart as an instance (with test mode, operator control and monitoring, central modification).
  - External view for SFC charts: Representation as block with all interconnections of the chart I/Os
  - Expanded status management (conforming with S88)
  - Several sequences per SFC (SFC chart: 8 sequences; SFC type: 32 sequences)
  - Full integration of the SIMATIC BATCH communication interface, interface blocks no longer required
- Support during configuration of PC components
- A significant reduction in the time taken to make changes has been achieved because all changes and expansions required for plant operation can be made centrally on the ES without deactivating the OS:
  - Adding and modifying pictures/reports
  - Adding and modifying archive tags

5 Operator Station - What's New?

- Increased performance due to optimization of the PLC-OS interface:
  - Significant increase in the net data rate of PLC-OS frames
  - 5000 process tags per OS server
  - Optional message and acknowledgment procedure: Acknowledgment triggered signaling to suppress "fluttering messages" - a message that has not been acknowledged is not sent again by the PLC.
- Servers can access the data of all reachable servers (archive, messages, tags, variables). 12 servers can be configured. Process pictures on one server can be interconnected with tags on other servers..
- PCS 7-OS/SIMATIC BATCH applications of the server are monitored for software problems (health check)
- High-performance archive system with Microsoft SQL Server database
- Maximum of 10000 process values per second can be acquired and archived with the archive server

- Maximum of 10 messages per second per server (permanent load)
- Maximum of 15000 messages in 10 seconds (avalanche of messages)
- Central, ideally redundant archive server for process values
- Cyclic archive with integrated swap-out option using backup (not an endless archive)
- Loop-in-alarm and picture selection via process tag display the process picture in which the process tag is located (no extra configuration work necessary). Up to now, only the faceplate was displayed.
- Additional "priority" attribute for messages:
  - Sorting according to priority
  - Message line above the area overview always displays the last pending message with the highest priority.
- Consistent use of the block comment:
  - In CFC and in the project object view
  - As tooltip for the block icons
  - As text in the "Event" column (for example "oil pressure" too high)
- Advanced status display to link process and message statuses in one or status display (efficient, simple to configure, without scripting)
- Faceplate Designer. The faceplates of the PCS 7 block libraries were created with the Faceplate Designer. You can modify the faceplates of the PCS 7 block library and create faceplates for any blocks without programming experience.
- Centralized setting of all process control options in the project editor. Adaptation of the area overview (number and arrangement of areas).
- New options for acoustic signaling (also using sound cards)
- Visual Basic as additional script language - in addition to the previous script language C

6 SIMATIC BATCH - What is new?

SIMATIC BATCH V6.0 is fully integrated in SIMATIC PCS 7 V6.0:

- The process cell data relevant to SIMATIC BATCH is configured using the engineering system (ES) - also possible online.
- SIMATIC BATCH has a modular structure and can be used in any process cell.
- SIMATIC BATCH V6.0 can be configured as a single workstation system or as a client-server system for any size of process cell.
- New redundant Batch Server operates with data replication (hot standby).
- As a functional unit, SIMATIC BATCH V6.0 and SIMATIC PCS 7 V6.0 fully cover the models described in the ISA S88.01 standard.
- Validation functionality complying with 21 CFR Part 11:
  - Audit Trail (change log): Logging of
    - Changes to recipes, formulas, and recipe operations
    - Changes in the batch data log, including versioning, during production
  - (Life cycle of the recipes, recipe operations, formulas)
  - Access protection with central user management for all OS and BATCH systems
  - Electronic signature
- Hierarchical recipes with levels for recipe unit procedures, recipe operations and phases
- Unit-neutral recipes (minimum engineering effort, simple validation) and control of load with dynamic unit assignment
- Communication with the programmable controller via PCS 7 operator stations (OS):
  - New interface to the PLC: SFC instances derived from the SFC type
  - für die AS-Batch-Kommunikation ist keine Anbindung von Schnittstellen durch den Anwender notwendig
  - To allow PLC-Batch communication, no linking of interfaces by the user is necessary).
  - User library for recipe operations (ROP library)

- Greater flexibility due to separation of formula and procedure
  - Faceplate for SIMATIC BATCH blocks with cross-selection in the active batch step
  - Fully integrated, type-based configuration in the ES (particularly in conjunction with SFC types)
  - Newly designed report tool, XML-based and IE-supported
  - Comments can be added to any BATCH-relevant messages
  - Graphic batch planning and chaining with collision monitoring of the unit allocation
- Standard interface for SIMATIC IT Framework
  - Data exchange using XML
  - Access protection
  - Control of several BATCH Servers over one API
  - Hidden distribution and redundancy
  - Event-based logon mechanism for user-specific step logs, material tracking, EBR, etc.

7 Software (Updates / Migration) - What's New?

You will find further information in the documentation on " Software Updates".

- If certain functions are not used
  - existing projects can be updated from SIMATIC PCS 7 V5.x to V6.0 without any configuration effort being necessary.
  - it is not necessary to stop the programmable controllers.
  - it is possible to update the OS with redundant OS servers online.
- existing projects can be updated from SIMATIC PCS 7 V5.x to V6.0 withoutany configuration effort being necessary if
- Certain functions and plant-specific situations require additional configuration.
- Some functions require the CPU to be stopped:
  - Inadequate reserves for the load memory, work memory, and code memory and CPU load.
  - Use of new SFC functions (more sequencers per chart, SFC type ...)
  - Use of the new message concept (CPU FW 3.1 and higher)
  - Use of the new message concept with the additional message priority attribute
  - Acknowledgment-triggered signaling (as of CPU-FW 3.1)
  - Conversion of existing hardware configurations to Configuration in Run (CiR)
  - Use of the CiR functionality is possible only with new firmware for the CPUs of the programmable controllers, new IM 153 for ET 200M and new IM 157 for DP/PA-Links.
  - PCS 7 Version 6.0 supports only Industrial Ethernet as the plant bus. PROFIBUS as the plant bus must be replaced.
  - SIMATIC BATCH
    - Engineering data with V4.02 interface blocks can be adopted in V6.0
    - Recipes are converted

8 Further Information

You will find more extensive and more detailed information on specific innovations relating to components of PCS 7 in the following files belonging to the specific component:

- whatsnew.wri and
- readme.wri

These files are on the "PCS 7 Toolset CD" in the installation folders of the components of PCS 7.

Online Documentation

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

What's new in the Libraries?What's New in PLC-OS Engineering?What's new in PH V6.0 ? What's new in the IEA V6.0 ?What's new in PO V6.0 ?

What's new in CFC V6.0 ?What's new in SFC V6.0 ?What's new in SFV V6.0 ?What's new in SIMATIC BATCH V6.0 ?