SIMATIC PCS 7

Performance you trust

What is new with SIMATIC PCS 7?
Version 8.0 SP1 and more
March 2013
SIMATIC PCS 7 – performance you trust
System Overview

Engineering System
- Process control libraries
- Hardware / Software configuration
- Process device management

Operator System
- Process control, trends, alarms
- User management

Management Console
- Software administration and plant inventory

Archiving and Reporting
- Real-time process data archive
- Data visualization for Operator System
- Reporting generation

Maintenance Station
- Performance monitoring of plant assets
- Fault analysis and repair tracking
- Information on mechanical assets

Automation Systems
- Hardware / software controller
- Fault-tolerant / safety related

Process I/O
- Remote I/O, intelligent field/process devices
- Integrated drives, power management

Batch automation
- Recipe editing and control
- Batch execution on server or AS

Route control
- Material transport (pipelines, conveyor belts)
- Graphical route network engineering

Safety
- Safety Matrix cause and effect diagram
- One platform: safety + standard application

APC
- Higher level process control methods
- MPC with operation point optimization

Telecontrol
- Telecontrol integrated with plant automation
- Integration of remote stations (RTU)

Power control
- Automation of switchgear plants
- IEC 61850 protocol for protection and control

Security
- Protection of networked industrial plants
- Multilevel security concept
SIMATIC PCS 7
Evolution

New with V8.0 SP1:
- User-definable alarm class.
- „Flat“ system configurations
- Redundant Proc. Historian
- HART via Profinet
- Management Console
- AFD 4/8
- Software Download

New with V8.0:
- Integrated Engineering
- Process Historian
- Profinet für PA
- Windows 7 / Server 2008
- PCS 7 PowerControl
- AS 416 FH
- AS mEC RTX
- IPC 647C / 847C
- Industrial Library

V5
- Safety Integrated
- H-Systems
- Multi Client/Server
- Fast Ethernet

2000

V6
- Online Changes
- Plant Asset Management
- Safety Matrix
- SIMATIC BATCH
- Web OS
- 21 CFR Part 11 Compl.
- SIMATIC PCS 7 Box
- SIMATIC Route Control

2003

V7
- New OS Look & Feel
- APL
- Improved Engineering
- Eng. compendium
- Extended remote I/O
- DataMonitor
- TeleControl
- Energy Management
- Scalable PCS 7 Box
- Remote Operations
- FDis
- Advanced ES
- Redundant FF
- Multi-User Engineering
- Advanced Process Control
- Version Cross Manager
- Open PCS 7
- FMR
- PROFIBUS PA Redundanz
- FF Integration
- PCS 7 Security

2006

V8

2011
SIMATIC PCS 7 V8.0 SP1

Overview

- **Operation**
  - „Flat“ system configurations
  - User-definable alarm classes
  - New IPC 427D for OS Clients

- **Archiving & Reporting**
  - Redundant Process Historian
  - Migration from CAS to Process Historian
  - Information Server for PCS 7 OS-Server

- **Automation System**
  - AS mEC RTX with Profinet I/O

- **System Libraries**
  - New function blocks

- **Process Devise Manager and Plant Asset Management**
  - HART via PROFINET
  - FF configuration in run
  - New SQL data base

- **Communication**
  - Further development of “PROFINET

- **Batch Automation**
  - New Batch „Basic license“
  - Dynamic unit attributes
  - New recipe object „parameter steps“

- **Industrial Security**

and a bit more…
Operation
SIMATIC PCS 7 V8.0 SP1
Client / Server or „flat“ system configurations

**Client / Server Configuration**
- Operator Station 1
- Operator Station 2
- Operator Station 3
- Operator Station 4
- Operator Station ...

**Flat System Configuration**
- Operator Station 1
- Operator Station ...
- Operator Station 8

- For medium to large projects
- More than 30 OS clients supported
- New solution for redundant terminal and plant bus with Parallel Redundancy Protocol (IEC standard)

- For small to medium size projects
- Multiple single station configuration with up to 8 operator workplaces
- Common alarm management and data archiving
SIMATIC PCS 7 V8.0 SP1
User-definable alarm classes

The user can choose between classic and new alarm concept:

- Six user-definable alarm classes with priority
- No fixed correlation between limit violations and alarm classes any more
- Alarms can be sorted by priority
- For APL objects the color scheme can be defined by the user

Key Benefits:

- Intuitive recognition of an alarm with respect to importance and urgency by the plant operator
- Clearly arranged alarm lists sorted by priority improve plant operator reaction times
- Higher plant availability through lower operator load
SIMATIC PCS 7 V8.0 SP1
Alarm Control – Columns with individual colors

User configurable presentation of alarm lists
- Individual configuration of each columns
  - Neutral color or dependent on alarm class
  - Flashing for non-acknowledged alarms on or off
- Influences all alarm lists in project (e.g. faceplates, standard alarm lists)

Key Benefits:
- Operator friendly, customer-specific design of alarm lists
SIMATIC PCS 7
SIMATIC Management Console

- Central standardized administration of SIMATIC PCS 7 software
- Inventory control of all installed hardware and software components of a PCS 7 installation

Key Benefits:

- Reduction of SW administration cost through more efficient workflow
- Fast analysis of installed software versions for planning of updates
- Fast analysis of installed hardware components for exchange actions
- Simple automated creation of „As-Built“ documentation
- Basis for long-term support of plants / Life-Cycle-Services
SIMATIC PCS 7 V8.0 SP1
OS Client based on IPC427D

- Intel® Processors: Core i7-3517UE
- DDR3 memory up to 8GB RAM
  4GB pre-installed
- 2 Variants
  - 2.5" hard disk with 250GB
  - SSD (Solid State Drive) with 50GB (High Endurance)
- Multi Monitoring with identical interfaces
- 4 x USB 3.0
- 2 x Ethernet GBit (teaming supported)
- Windows 7 Ultimate 64Bit

**Key Benefits:**

- Robust and compact OS client system
- Saves operator channel extensions by local mounting
Archiving & Reporting
SIMATIC PCS 7 V8.0 SP1
Process Historian (PH) and Information Server (IS)

- Redundant Process Historian
- Migration from CAS to Process Historian (CAS V7.0 SP2 and SP3)
- Process Historian Support of multiple OS Single Stations sharing same PCS 7 project
- Information Server for PCS 7 OS-Server and multiple sources: support of SIMATIC PCS 7 OS and multiple sources as database source for IS
- Improved IS subscriptions and templates
  - tag and alarm trigger
  - aggregation method „total“ for calculation of material consumption

Key Benefits:
- Higher Availability of archived data with redundant Process Historian
- Easy migration of CAS data due to data based migration tool in PH
- More flexibility for plan report with direct connection between Information Server and Operator Station
Automation System
SIMATIC PCS 7 V8.0 SP 1
AS mEC RTX with Profinet I/O

- Expansion from Remote IO via Profinet with ET200M

Key Benefits:
- Flexible and good value Automation System for the entry level
- Latest embedded PC technology with SIMATIC S7-300 look-and-feel
Fieldbus Hardware
SIMATIC Active Field Distributor
New AFD4 and AFD8

- The same mechanical and electrical design of AFDiS
- Automatic bus termination
- Short-circuit protection and chatter suppression
- Robust IP66 aluminum housing and grouted printed circuit board
- Support line and ring architecture
- Max. 8 AFD or max. 5 mixed with AFDiS in one fieldbus segment
- In a ring segment an AFD can be replaced during operation without the segment failure

Customer Benefits

- Simplified commissioning
- Connection of PA/FF devices as simple as point-to-point connections
- Increased reliability
- Increased plant availability
- Easy extension of a running plant
### AFD product line feature overview

#### Feature

<table>
<thead>
<tr>
<th>Feature</th>
<th>Previous version</th>
<th>New product line</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFS</td>
<td>AFD</td>
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<tr>
<td>Spurs</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Direct grounding</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Grounding bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic bus termination</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Coupler redundancy</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Ring redundancy</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Short-circuit-proof spurs</td>
<td>60mA</td>
<td></td>
</tr>
<tr>
<td>Electronic chatter suppression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status LEDs</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Trunk cover with auto switch-off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP65</td>
<td>IP65</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-25°…70°</td>
<td>-25°…70°</td>
</tr>
<tr>
<td>Approved for hazardous area (Device / Spurs)</td>
<td>zone 2 / Ex e</td>
<td>zone 2 / Ex e</td>
</tr>
<tr>
<td>Integrated repeater</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
System Libraries
New function blocks in „L“ → Large und „S“ → Small

Customer Benefit:
- Saving of memory usage and CPU runtime with small function blocks
- Simple analogous operator OpAnS without messages and does not need POs
The block calculates the pressure and/or temperature compensation for measurements with the differential pressure method.

This refers to measurements from restrictors, standard flow nozzles, venturi nozzles and pitot tubes.

The block can be used for gases and vapors, saturated steam and liquids to calculate the volume flow rate or, for liquids, to calculate the mass flow rate.

When the sensor extracts the square root of the differential pressure, the P_SqrtOn parameter must be set to ‘true’.

**Customer Benefit:**

- Easy calculation of correlation for measurements of pressure and temperature
SIMATIC PCS 7 Version 8.0 SP1
APL - Function block Trigger

- Detection of rising and falling edges.
- This block checks the input variable Clk for occurrences of rising and falling edges, and signals them at the outputs EdgeRising and EdgeFalling.
- Output EdgeRising is set to 1 for a rising edge. Output EdgeFalling is set to 1 for a falling edge.

Customer Benefit:
- APL conform detection of rising and falling edges
SIMATIC PCS 7 Version 8.0 SP1
APL - New Feature for the PID-Tuner

- Estimate of the relative device energy consumption of different PID designs in the context of the simulation of the closed control system in the PID tuner.
- Comparative PID design for the same task in one diagram

**Customer benefit:**
- Possibility to compare different regulator designs directly side by side for the same task
- Controller optimization according to processing or economic points of view
PDM and Maintenance
SIMATIC PCS 7 V8.0 SP1
SIMATIC PDM V8.0.2

- PROFINET (Field devices, HART field devices via remote I/O)
- Incremental download for Foundation Fieldbus communication - FF configuration changes in run
- New SQL data base
- Change log
- Device comparison (offline/offline + offline/online)
- Extended Device Integration Manager (e.g. definition of project specific device libraries)
- Export and import of network structures
- Parameter search function in parameter view

Key Benefits:
- More flexibility with HART via PROFINET
- Higher plant availability though FF configuration changes in run
- Process optimization with offline/offline + offline/online comparison of devices
SIMATIC PCS 7 V8.0 SP1
SIMATIC PCS 7 Maintenance Station

- Integration of CPs in central rack
- Improved
  - diagnostics of IPCs
  - diagnostics of server-client connection
  - diagnostics of redundant servers

Key Benefits:
- Improved diagnostics of system components
Communication
SIMATIC PCS 7 V8.0 SP 1
Further development of “PROFINET for Process Automation”

- HART via PROFINET
- SIMOCODE integration via PROFINET

Customer Benefits
- HART field devices can be parameterized from a central engineering station via SIMATIC PDM
- Complete SIMOCODE integration via PROFINET: Support of hardware and CFC driver function block
Batch Automation
New license „BATCH Basic“

Dynamic unit attributes

User-defined unit status

New recipe object „parameter steps“ (for parameter control)

New reporting based on MS Reporting Services

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Key Benefits:

Low-cost (Cost effective) entry solution for SIMATIC BATCH for simple batch applications

Improved flexibility for unit allocation

Improved customer-specific batch reports
SIMATIC PCS 7 V8.0 SP1
SIMATIC BATCH

- Extended information: in Batch CC (in real time) and in the report
- Search in batches and recipes
  - Text, data types, structures, material, unit of measure, phase, library reference
- Easy Batch creation
  - creation of new charge directly from the context menu

Key Benefits:
- Additional user information
- Efficient search in batches and recipes
- Improved handling of batch creation
Industrial Security
**Key Benefits:**

- New **Scalance S V3** with additional DMZ port for safe remote access
- User-specific Firewall rules and user authentication (Login and password)
- Protection of controller via **CP 443-1 Advanced** with firewall and VPN for authentication and data encryption
- **CP 1628** for protection of PCs with firewall and VPN for authentication and data encryption

![Diagram of Scalance S and CP devices with security integration]
SIMATIC PCS 7 V8.0 SP 1
Industrial Security

- As the first Automation vendor Siemens achieved the Achilles Level 2 certificate for communication robustness
  - S7-400 F/FH CPU V6
  - CP 443-1 Adv
  - CP 1628
- OS Web Client Security
  - Web Server certificate for secure authenticated communication via https connection
  - OS Web Client certificate as additional prerequisite for establishing https connection

Key Benefits:
- Achilles L2 Certificate for the main communication components
- Increased Security for PCS 7 Web Option
Online Software & License Download
**Main features:**

- Short-term availability of software and licenses – regardless of time and place (order via Industry Mall)
- Software download available as iso-file and / or exe-file (SIWA compressed)
- Optimized download using the Download Manager

**Key Benefits:**

- Reduction of the administration effort and inventory costs
- Clear and simple license management
- A benefit for the environment: eliminating physical data carriers
Technology Components
Integration of medium voltage switch gear plants into SIMATIC PCS 7

PowerControl Library for OS:
- Technological objects for electrical units:
  - feeder, generator, motor
  - transformer
  - synchronization
  - line (e.g. medium voltage line)
  - bus bar
- Block icons, faceplates in APL style

Key Benefits:
- Further increase of integration level by merging process and energy plant
- Common monitoring and operation with APL standards
- Investment protection based on international industry standard IEC 61850
Innovations 2013
Already with PCS 7 V8.0:
- General release for PCS 7 Clients
- Project specific release for PCS 7 Server, ES and BATCH Server

New with PCS 7:
- Communication with AS 400F/FH (“soft net redundancy” - separate release)

Key Benefits:
- Reduced administrative work and costs through central administration
- Long-term, stable system environment by decoupling of computer hardware, operating system and versions of the process control system
- Higher hardware efficiency through shared resources
- Easier expansion / modernization of the plant through fast installation of new clients
SIMATIC PCS 7
System Libraries (March / April 2013)

- Condition Monitoring Library (via download, included in standard with V8.1)
  - PumpMon, ValveMon (March 2013)
- New Library Advanced Process Graphics Library (APGL)
  - OS objects for e.g. bar-, spider diagram, bar trend (April 2013)
- Industry Library SP1
  - APC link function block, control PID for S7-300, User Programmable Alarm Classes for panels (March 2013)

Key Benefits:

- Increased plant availability via support of mechanical devices
- Reduced operator workload through focusing on relevant information based on modern HMI
- Higher level of plant integration by improved embedding of package units and panels
Thank you for your attention!