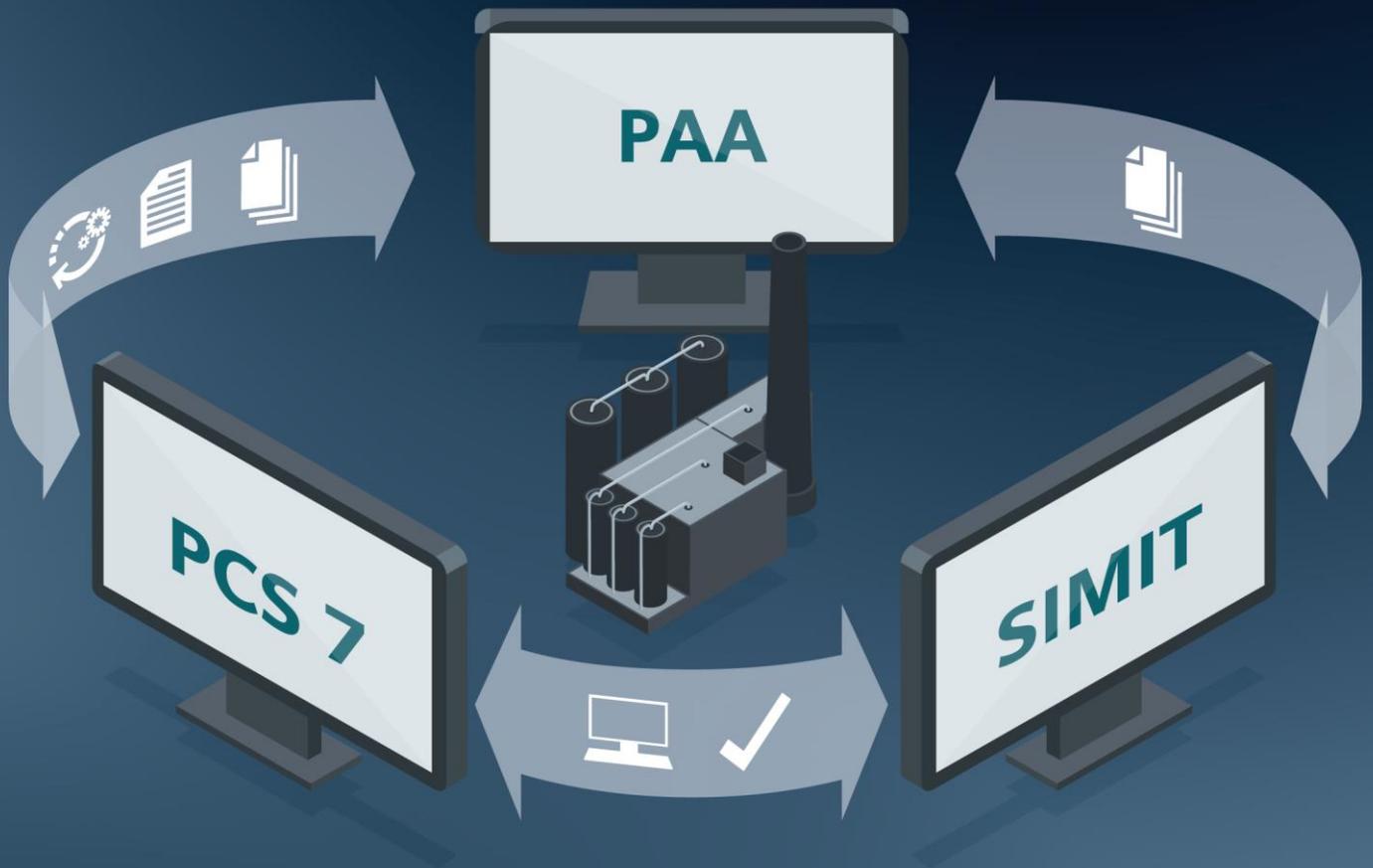


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Engineering Efficiency in the Interaction of SIMATIC PCS 7, PAA and SIMIT

SIMATIC PCS 7 Plant Automation Accelerator V3.0,
SIMATIC PCS 7 V9.0, SIMIT Simulation V10.0

<https://support.industry.siemens.com/cs/ww/en/view/109770538>

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Table of contents

Legal information	2
1 Introduction	4
1.1 Engineering efficiency out-of-the-box.....	4
1.2 Modes of operation and benefits	5
1.2.1 Overview of the underlying systems	5
1.2.2 Comparison of real and simulated system environment	6
1.2.3 Interfaces and data exchange between the systems	7
1.2.4 Advantages	8
1.3 Components used	8
2 System interaction of PAA, SIMIT and PCS 7	9
2.1 Workflow	9
2.2 Creating templates in PCS 7	12
2.3 Import templates from PCS 7 to PAA.....	13
2.4 Mass data engineering	14
2.4.1 Software engineering	14
2.4.2 Hardware engineering	15
2.4.3 Connecting hardware and software	16
2.5 Visualization engineering	17
2.6 Testing at signal level (loop check)	18
2.7 Creating templates in SIMIT	20
2.8 Import of the software to SIMIT	21
2.9 Testing at device level.....	22
3 Useful information	23
3.1.1 COMOS	23
3.1.2 SIMATIC PCS 7	25
3.1.3 SIMIT Simulation	27
4 Additional information	28
4.1 Service and support	28
4.2 Links and literature	29
4.3 Change documentation	29

1 Introduction

1.1 Engineering efficiency out-of-the-box

The innovative engineering software SIMATIC PCS 7 Plant Automation Accelerator (PAA) is a fully integrated solution for integrated plant and automation planning. The use of PAA promises consistent engineering without system breaks between automation planning and our SIMATIC PCS 7 control system. Through its object-oriented approach, PAA enables work on a central data platform and thus enables a consistent flow of engineering data throughout the life cycle of the plant. PAA offers fully integrated planning based on an electronic workflow, from the preparation of quotations and automatically generated control technology data from electrical planning to the as-is documentation of process automation. This modular engineering approach raises overall project efficiency and minimizes risks.

PAA supports the standardized exchange of GSD data for PROFIBUS devices as well as the simple and fast configuration of PROFINET-capable devices. The current NE 150 (VDI 3697) standard is supported for the open exchange of engineering data between the CAE system and PCS engineering tools.

Further requirements for consistent engineering are:

- Central planning from plant engineering to automation - based on an electronic workflow
- Consistent use of templates for standardized automation solutions
- High data consistency and documentation in planning and engineering
- Parallel processing of all data of the trades through continuous engineering
- Standardized interfaces between the different software products
- Simulation-supported engineering, i.e. parallel engineering and testing with SIMIT

Subsequent virtual commissioning as part of a FAT The example of the planning and engineering of a level control system for a stirred tank reactor illustrates the basic procedure and the advantages of the interaction of the following software products:

- SIMATIC PCS 7 Plant Automation Accelerator (PAA)
- SIMIT Simulation Platform
- SIMATIC PCS 7

1.2 Modes of operation and benefits

1.2.1 Overview of the underlying systems

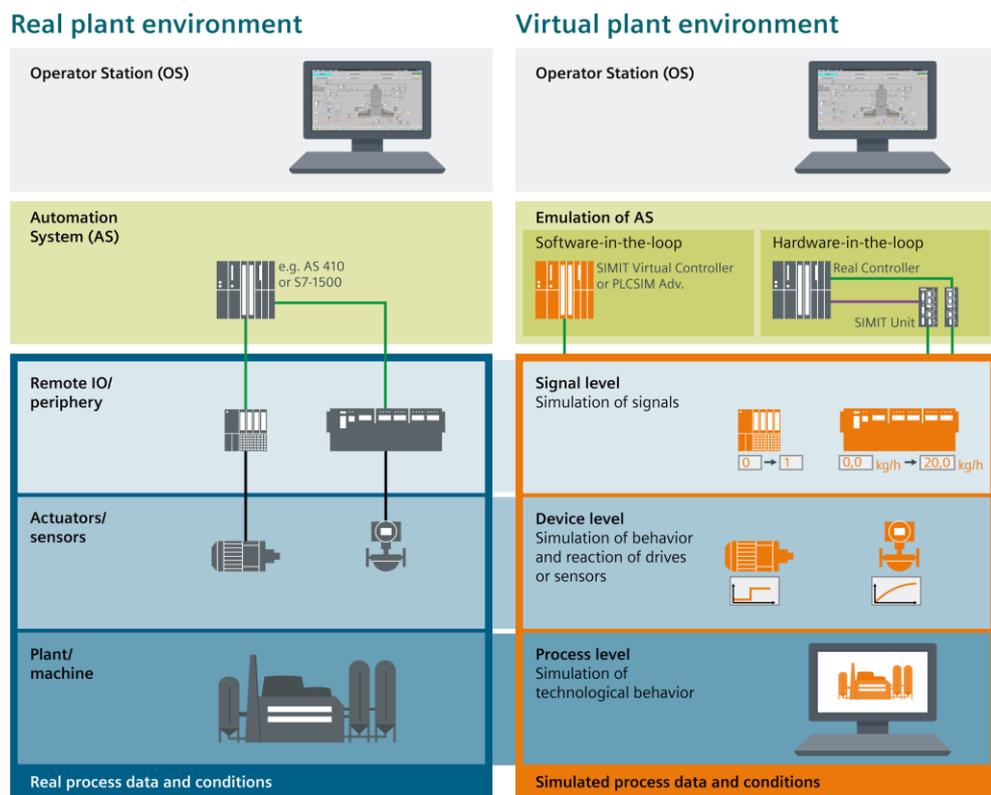
The systems have the following functions and advantages:

- PAA unites all the disciplines involved, from planning to commissioning, operation and modernization. Both the plant planner and the operator access the same object data using a central database.
- With SIMIT, you can validate all relevant automation functions with the associated process signals or field device behavior long before the plant is commissioned.
- With the Control Module Types (CMTs), the SIMATIC PCS 7 process control system enables a standardized structure of the automation program. The underlying type/instance concept optimizes the reusability of standards and improves the structuring of the project. Adaptations to future requirements can be implemented more quickly.
- The interaction of the systems is guaranteed by standardized interfaces. This allows data to be exchanged between the software products and thus kept consistent.
- The combination of these systems ensures efficient and integrated plant management over the entire life cycle of a plant. Thus, it is possible to shorten the market introduction time, save costs, improve quality and keep the plant documentation permanently consistent and up to date.
- The goal is to generate a digital image of the real plant that is as complete as possible through integrated engineering with PAA, SIMIT and SIMATIC PCS 7.

1.2.2 Comparison of real and simulated system environment

SIMIT fulfills the entire scope of real-time simulation required for comprehensive testing and virtual commissioning of automation projects. For this SIMIT provides a structured modeling, based on three simulation levels:

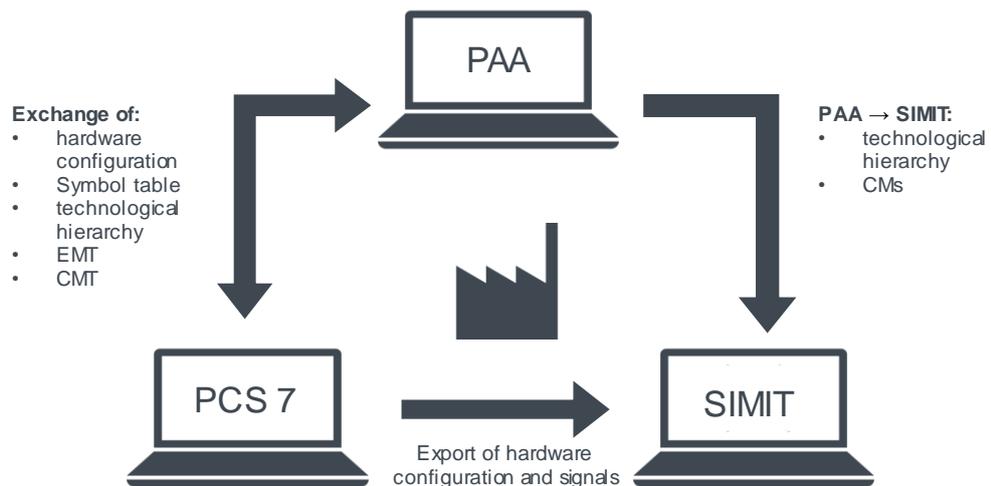
- the signal level simulates signals to the Inputs of a controller and its outputs. At this level it is possible to simulate the process environment and associated devices which are connected to the controller via I/O modules. Such signals can be declared and defined manually in the SIMIT Simulation using the automatic import function. The signal import function will be especially used to import the signal data of the a SIMATIC PCS 7 project.
- the device level specifically enables the simulation of the behavior of actuators and sensors (field devices). The device simulation models can be found in the SIMIT basic components libraries DRIVES and SENSORS. Further device models can be created using and modifying existing ones, or by creating new ones using SIMIT templates or other SIMIT tools (e.g. CTE).
- the process level enables the SIMIT user to model the technical equipment behavior, a machine or a process. The modeling can be made using the simulation components provided by either the basic SIMIT STANDARD library or the optional libraries.



1.2.3 Interfaces and data exchange between the systems

- **PAA <> PCS 7**
Interface to SIMATIC PCS 7
This can be used to exchange automation engineering data.
- **PCS 7 > SIMIT**
The installation folder of SIMIT contains a hardware export tool with which the hardware configuration from PCS 7 can be exported and imported into SIMIT. If direct access to the PCS 7 project is possible, the information from the hardware configuration can be imported automatically. The transfer of this data into SIMIT, primarily the symbol table in the form of inputs and outputs with associated address range, is required for the creation of a Virtual Controller (VC).
- **PAA > SIMIT**
From PAA the CMs can be exported and imported into SIMIT with the information regarding their technological hierarchy. In this way, if existing templates are used or created once, the device level in SIMIT is automatically generated with the help of the existing engineering data. The functionalities of the individual CMs and their signals can be tested using the behavior models of the individual devices.

As an alternative to the extraction of the CMs from PAA, the CMs can also be transferred directly from PCS 7 to SIMIT.



1.2.4 Advantages

- Shorter project durations thanks to easy and consistent data synchronization between engineering and automation
- Error reduction and shorter project duration through early testing and validation of individual automation functions, system components and even entire systems
- Shorter times for plant expansion and optimization
- Increased plant availability thanks to error-free data transfer and system documentation that is always up-to-date
- Consistent as-is documentation of software and hardware throughout the lifecycle
- Better economy through intelligent fusion of the digital and real worlds

1.3 Components used

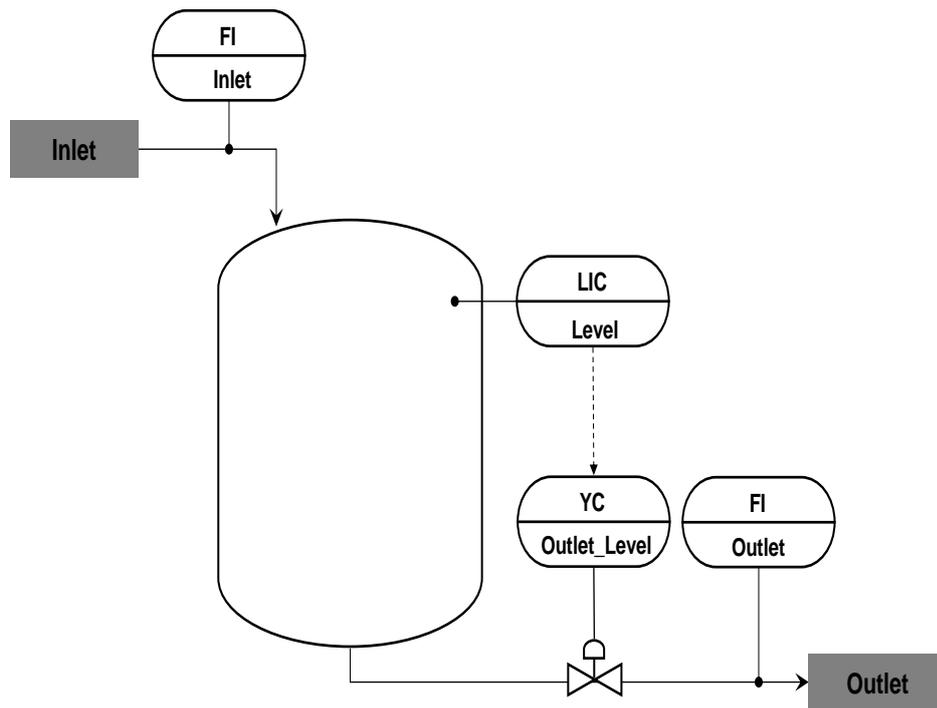
This application example was created with the following software components, but can also be applied to the newer product versions.

Component	Quantity	Article number	Note
SIMATIC PCS 7 V9.0	1	6ES7658-4XX58-0YT8	-
SIMATIC PCS 7 Plant Automation Accelerator V3.0	1	Please get in touch for this with your local sales partner. http://w3.siemens.com/aspa_app/	
SIMIT Simulation V10	1	6DL5260-0BX00-0YL8	-

2 System interaction of PAA, SIMIT and PCS 7

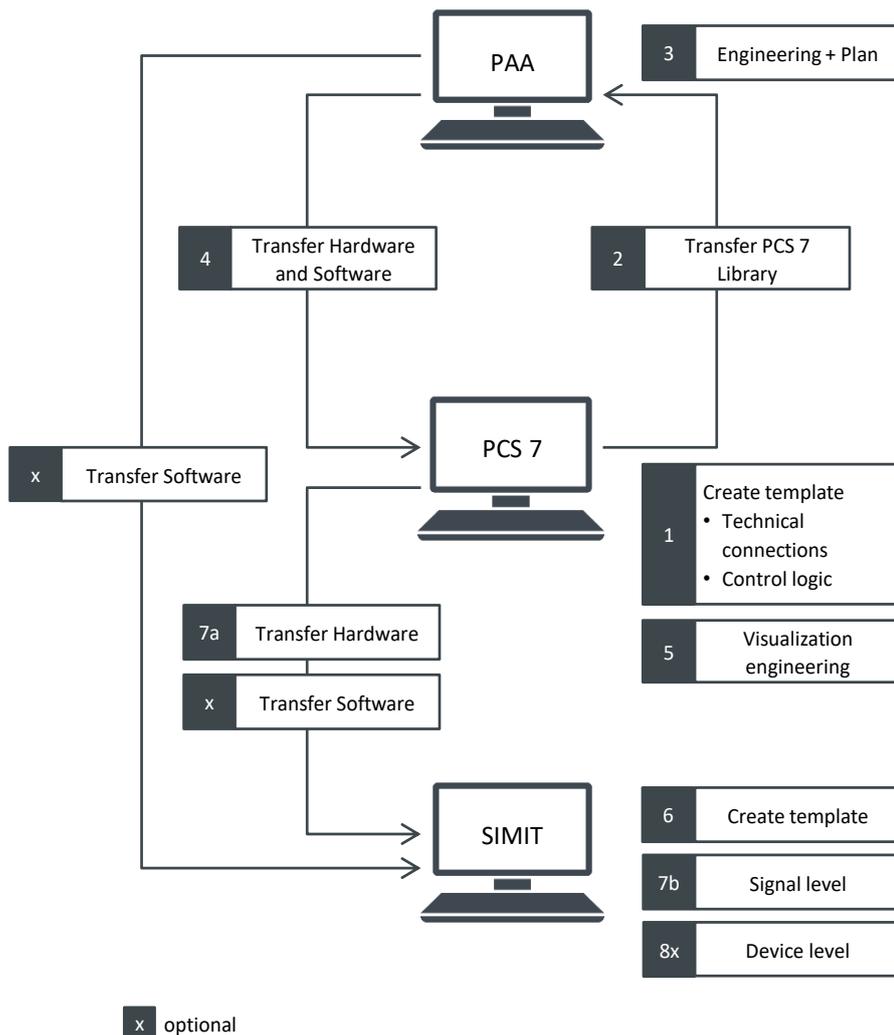
2.1 Workflow

This chapter uses an example to illustrate and explain the workflow from creating the templates to testing. The following R&I diagram shows the example of an equipment module (technical equipment) for level control via product flow, which consists of two interconnected CMs. The Equipment Module is a component of a subsystem of the stirred tank reactor.



The system interaction between PAA, SIMIT and PCS 7 may require different procedures depending on the project conditions. The following workflow describes the use case in which types are first created in PCS 7 and then transferred to PAA. In the PAA, hardware and software engineering takes place before the data is transferred to PCS 7 to carry out the engineering of the visualization. For the simulation, the data is transferred from PCS 7 and PAA to SIMIT.

Note Another variant is, for example, if CMT placeholders are created at the beginning of the PAA during software engineering. Only in a later step will the CMT be equipped with automation functions in PCS 7.



The following steps describe the basic procedure and consistent data transfer:

1. Templates, the so-called CMTs, are created in SIMATIC PCS 7. These are process objects, such as motors, controllers or valves, which contain all the necessary automation functions.
The CMT serves as a template (type) for multiple instantiation in the project. In addition to the automation logic, the CMT has a simpler view for PAA and SIMIT via the technological connections.
2. The CMTs created are imported from SIMATIC PCS 7 to PAA in the form of a library.
3. The software engineering of the automation program takes place in the PAA, where the templates are instantiated and parameterized.
Parallel to the software engineering, the automation hardware, such as controllers, IO modules and modules, is also being engineered. Then the parallel engineering of SW (process objects) and HW (HW modules) is linked with each other.
4. The automation program and the hardware configuration are imported into PCS 7 from PAA. The planning information is used for the automatic generation of the automation program and the hardware configuration in PCS 7.

5. Visualization engineering takes place in PCS 7. The objects that can be operated are generated from the automation program and combined with static elements to form overview images.
6. In SIMIT the settings of the coupling between SIMIT and PCS 7 are configured. By loading the automation program from PCS 7 into the Virtual Controller (VC) of SIMIT, simple loop checks of the signal level can be performed.
- 7x. In SIMIT, behavior models of individual devices are modeled to match the templates of the CMTs from PCS 7. The templates in SIMIT are the counterpart to a CMT in PAA and PCS 7, so both must have the same name. In addition, the names of the connectors of the templates in SIMIT must correspond to the names of the Technological Connectors of the CMT from PCS 7.
- x. By importing the CMs from PAA or PCS 7, the device level can be created automatically on the basis of the templates from step 7x. The planning and engineering data are intelligently reused here.
- 8x. After importing the CMs from PAA or PCS 7 to SIMIT, the device level was created. Now the simulation can be started and the automation program of the PCS 7 project can be loaded into the VC (Virtual Controller). This makes it possible to test the automation program against the simulation in the form of the signal and device level.

2.2 Creating templates in PCS 7

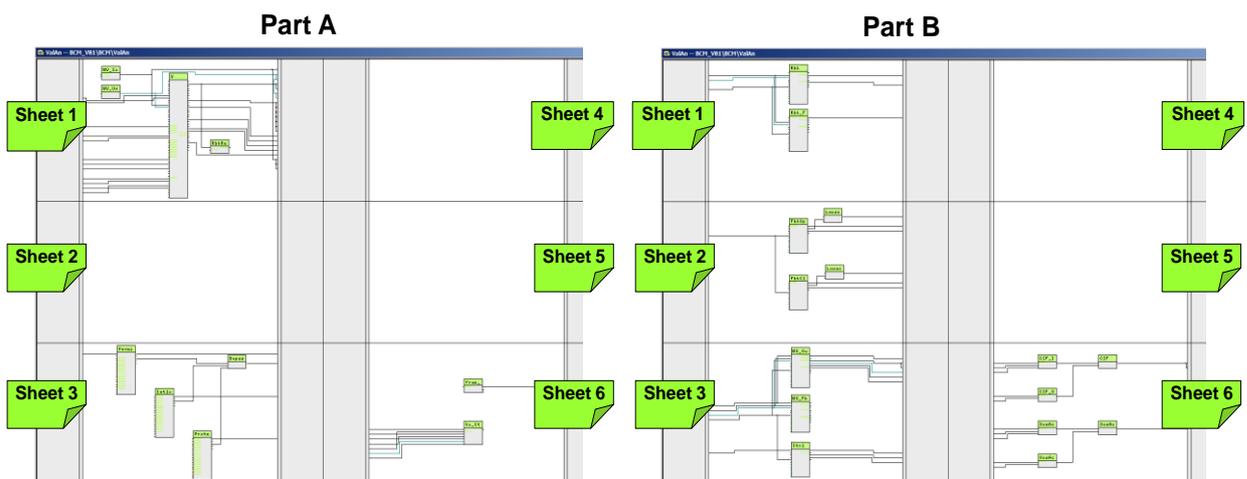
Introduction

At the beginning of automation planning, templates for the control and valve control function are required for the Equipment Module. In PCS 7 and PAA these are referred to as Control Module Types (CMTs) and in SIMIT as templates.

For example, in stirred tank reactors the basic function of all valves is the same. For this reason it makes sense to create a CMT for all control valves. The CMT is generally programmed and stored in the master data library of PCS 7. This allows the automation solution to be set up in a standardized way, because each CMT can be instantiated flexibly and multiple times in the automation project. The instances are parameterized and interconnected.

Valve CMT

The following example shows the structure of an analog control valve with optional functions, e.g. for interlocks. In addition, the CMT has technological connections with parameters and signals. In the PCS 7 environment, the technological connections are required for the alignment of type and instance, while in the PAA environment the connections are required for the interconnection of the individual instantiated CMTs.

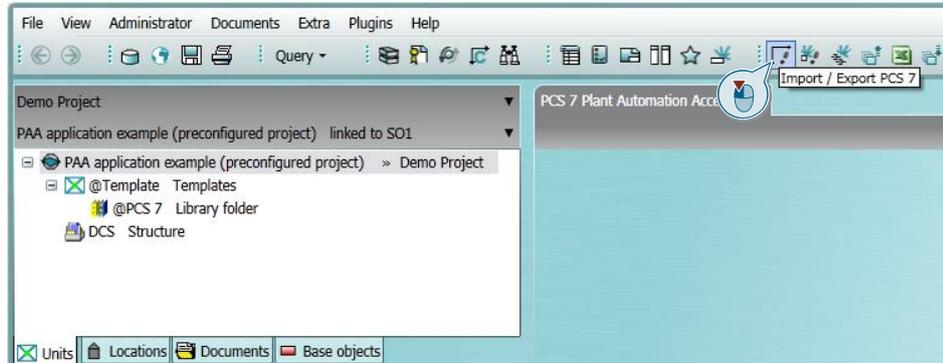


The CMT shown here is part of the library of the project "Technical Functions for PCS 7 in the Chemical Industry". You can find the example project under the link: <https://support.industry.siemens.com/cs/ww/en/view/53843373>.

Further information on creating CMTs can be found in the application example "[Control Module \(CM\) Technology - Efficient Engineering in SIMATIC PCS 7](#)".

2.3 Import templates from PCS 7 to PAA

In PAA, the created templates (CMTs) can be imported in the form of a library. For this purpose, the PAA offers the function "Import/Export PCS 7" with the option "Import".



The "Data Transfer - Generate/Import" dialog opens. When importing, only differences between the PCS 7 library and the PAA library are imported. The comparison result is displayed in the "Data transfer" window. The import creates a DCS structure. Below this DCS structure, the technological hierarchy folders and the CM instances are created.

Further information on importing data from PCS 7 to PAA can be found in the application example "[SIMATIC PCS 7 Plant Automation Accelerator on a practical example](#)".

2.4 Mass data engineering

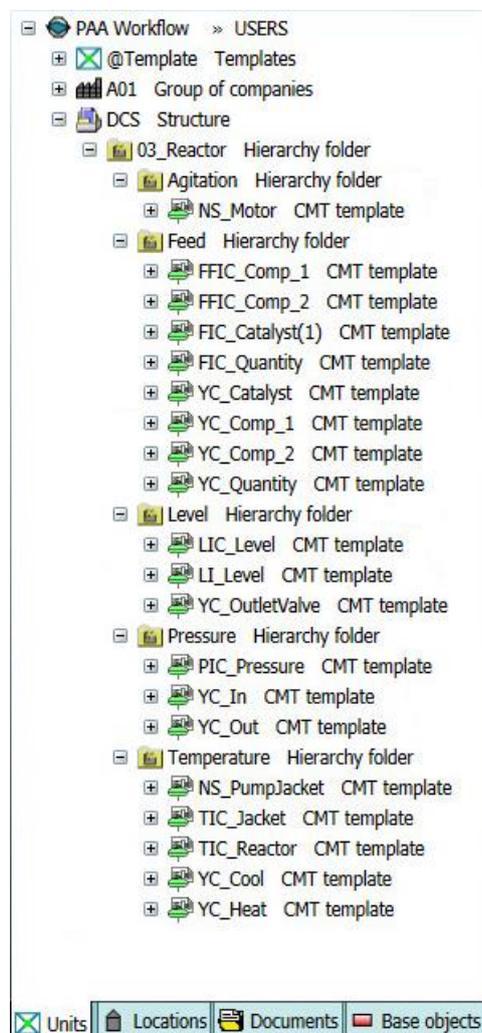
The engineering of SW and HW can be performed in PAA both sequentially and in parallel. This allows a high degree of flexibility in the distribution of tasks.

The following example shows the parallel engineering of SW and HW.

2.4.1 Software engineering

After importing the templates from PCS 7, they are available in PAA. In contrast to PCS 7, the instances cannot be derived directly from the templates, but must be created as individual variants of a CMT. With a variant (called SubCM), only the required part of the CMT program logic is used and the unneeded part is deactivated.

The required instances (CMs) are created from the SubCMs. These CMs represent the automation logic and must be interconnected with each other and with the corresponding hardware. The following figure shows an example of the structure of a DCS structure.



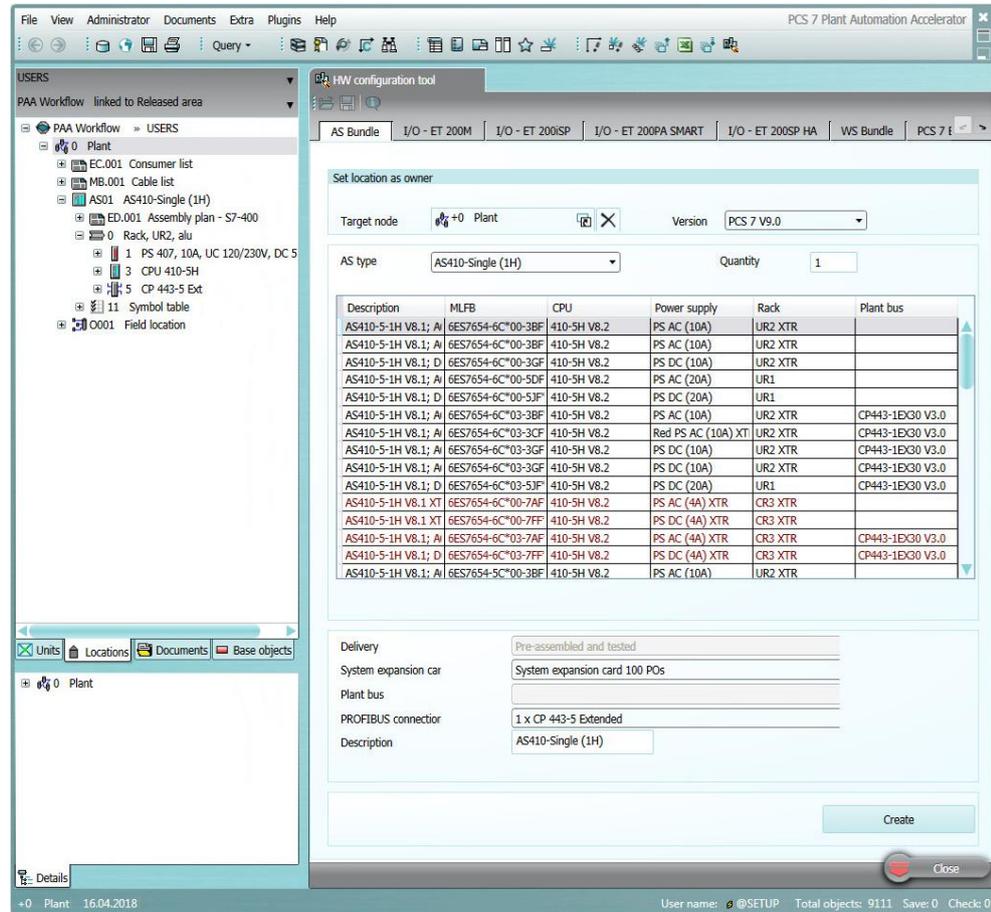
2.4.2 Hardware engineering

After the CMTs have been created, the hardware planning in PAA is started.

At the beginning, you create the location structure of your installation.

With the hardware configurator you can create your AS-Bundle, the distributed periphery and your OS. You can then use preconfigured queries to configure the addresses, slots, and bus interconnection.

Using reports such as the Configuration Plan, you can easily get an overview, such as a hardware bill of materials or the Assembly Plan.

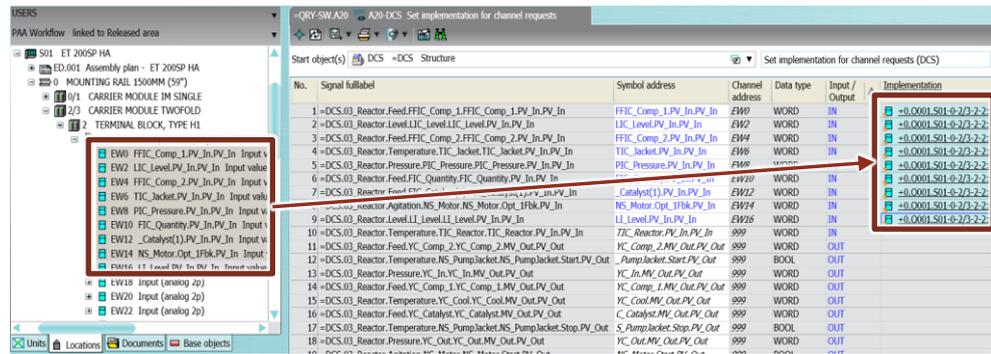


After automation planning, you can export the hardware configuration and the CMTs from PAA to SIMATIC PCS 7.

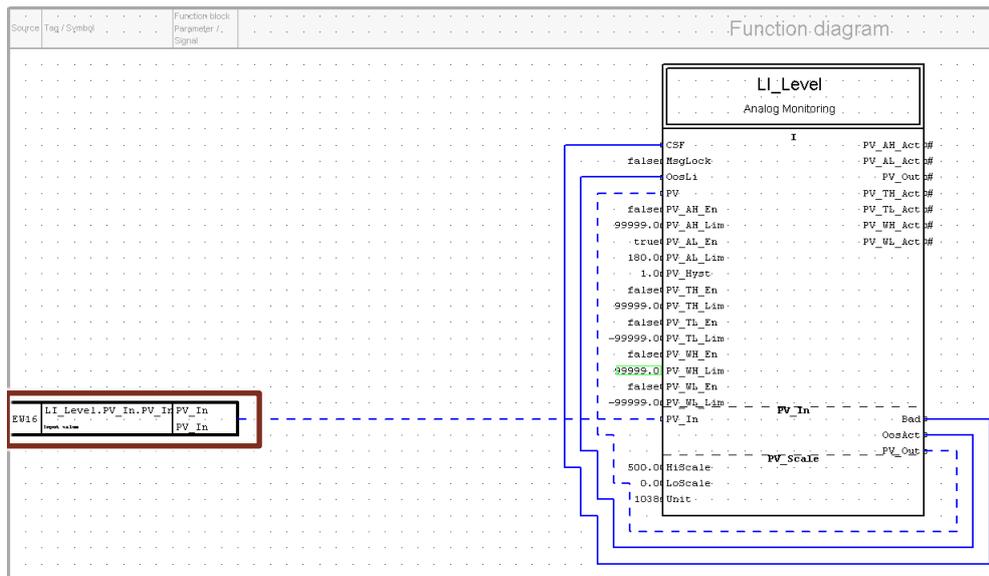
2.4.3 Connecting hardware and software

The hardware is then linked to the software. The PAA contains a ready-made query for this purpose. With the query you can connect the inputs and outputs of the CMs to the hardware in masses.

The query shows all channel requirements of the automation program. Using drag & drop, the hardware inputs/outputs are dragged into the "Implementation" column and connected to the channel requirements of the CMs.



The connections are also displayed in the function chart of the CM.



Information on software and hardware engineering as well as other PAA functions can be found in the following application example "[SIMATIC PCS 7 Plant Automation Accelerator on a practical example](#)".

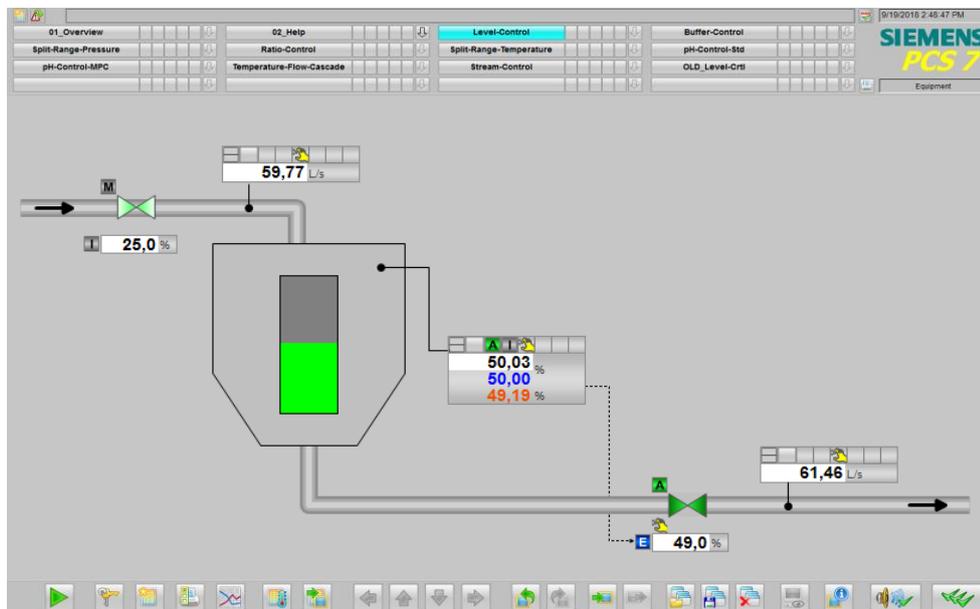
2.5 Visualization engineering

Complex process plants pose an enormous challenge for the operating personnel. Plant operators today are in most cases far more than just traditional process operators. In addition to operational process management, the range of tasks includes product quality assurance, optimization of resources used and maintaining high performance rates. In order to fulfill this requirement reliably, the operator needs a clear presentation of the information from the plant.

To ensure this, PCS 7 offers standardized image components as well as freely definable image components and faceplates. With these components, a clear visualization adapted to the process is generated. The PCS 7 function "Translate OS" generates the visual image of the automation program and automatically links the image blocks and faceplates with the respective variables.

Note

The automatic creation and linking of image objects is supported by the PCS 7 libraries developed for this purpose, such as APL.



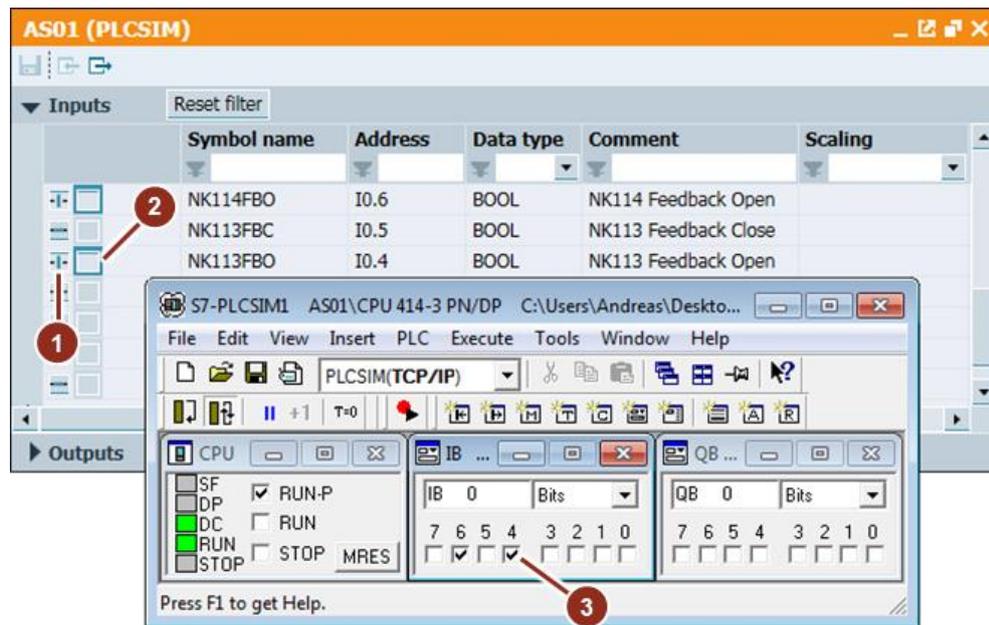
The illustrated process diagram is part of the project "Technical functions for PCS 7 using the example of the chemical industry". You can find the example project under the link: <https://support.industry.siemens.com/cs/ww/en/view/53843373>.

2.6 Testing at signal level (loop check)

Plant signals are simulated on the signal level. Before testing the automation program, one or more interfaces (couplings) between the automation system and the simulation model must be configured. When you select the coupling, you specify the communication partner with which SIMIT exchanges data.

After setting the coupling, the analog signals may have to be normalized. In PCS 7, process values are converted from a raw value into a process value by channel modules, e.g. "PCS 7AnIn", or e.g. "PCS7AnOu" from a process value into a raw value. The raw value is normally processed as a 16-bit variable in the PCS 7 program. Therefore, the analog value for the data exchange between PCS 7 and SIMIT must be converted to the raw value with 16 bits via the programming interface.

After creating the data exchange, a function test can be carried out in SIMIT. PLCSIM provides the dialogs required for this, with which you can observe or change the signals on the basis of the I/O address. The Virtual Controller does not offer this function; however, using the Virtual Controller, you can also carry out a signal test at an early stage using variable tables in the SIMATIC Manager, for example.



Further information on the coupling of SIMIT with PCS 7 can be found in the application example "[First Steps with SIMIT Simulation and SIMATIC PCS 7](https://support.industry.siemens.com/cs/ww/en/view/109742154)": <https://support.industry.siemens.com/cs/ww/en/view/109742154>".

Differences between PLCSIM and the SIMIT Virtual Controller

S7-PLSCIM (classic)	SIMIT Virtual Controller
<ul style="list-style-type: none"> • Emulation of S7-300/400 Controller programs • Integrated in the engineering system • Maximum 8 instances • All emulated controllers and the simulation on one PC • Real-time execution (Windows) 	<ul style="list-style-type: none"> • Emulation of S7-300/400 Controller programs • Independent of the engineering system • 32 controller instances in each SIMIT station and generally >50AS • Distribution to several PCs • Virtual Time Management (fast/slow, time synchronization) • Integrated into SIMIT • Project information directly from SIMATIC Manager
<ul style="list-style-type: none"> • Connection to SIMIT via standard coupling • Licensing by "Automation License Manager". 	<ul style="list-style-type: none"> • Connection to SIMIT via standard coupling • Licensing by the SIMIT SF-Dongle
	<ul style="list-style-type: none"> • Management of snapshots • Communication with PCS 7 BS/WinCC on separate PC • Debug function such as Start, Stop, Pause

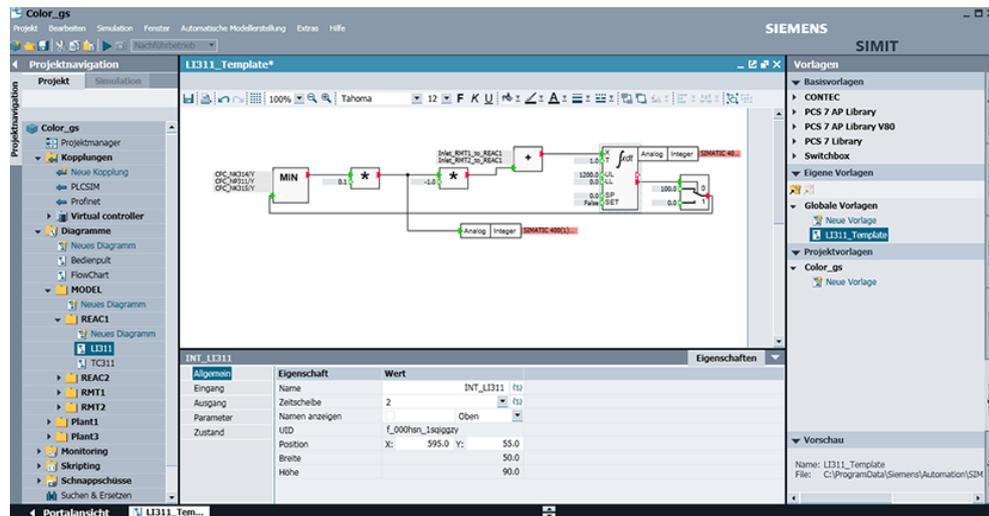
Benefits of the VC

- Emulation of S7-300/400 or PCS 7 controllers
 - Supports S7 redundancy protocol, route control and safety matrix
- Scalability
 - Distribution to several PCs
 - Direct import of PCS 7 project information from the SIMATIC manager
- Snapshots
 - Storage of the current controller or simulation status
 - Any reuse
 - Backtracking (from SIMIT V10.1)
- Virtual Time Management
 - Slow down/accelerate simulation

2.7 Creating templates in SIMIT

In templates, recurring functions or behavioral models of a simulation model, such as parts of a diagram, are prepared in such a way that you can reuse them as templates for diagrams when creating projects. In templates, you can insert all elements that you also use in diagrams. In this case, a template in SIMIT reflects the function of a CMT in PCS 7 and requires an identical name for this application. In addition, the names of the connectors of the templates in SIMIT must match the names of the Technological Connectors of the CMT from PCS 7.

In the editor, you can model and edit the template using the components, controls, macro components, graphics, templates, and projects available in the template editor.



Additional information for creating templates can be found in the application example "Simulation with SIMIT and SIMATIC PCS 7 using a practical example" under the following link:

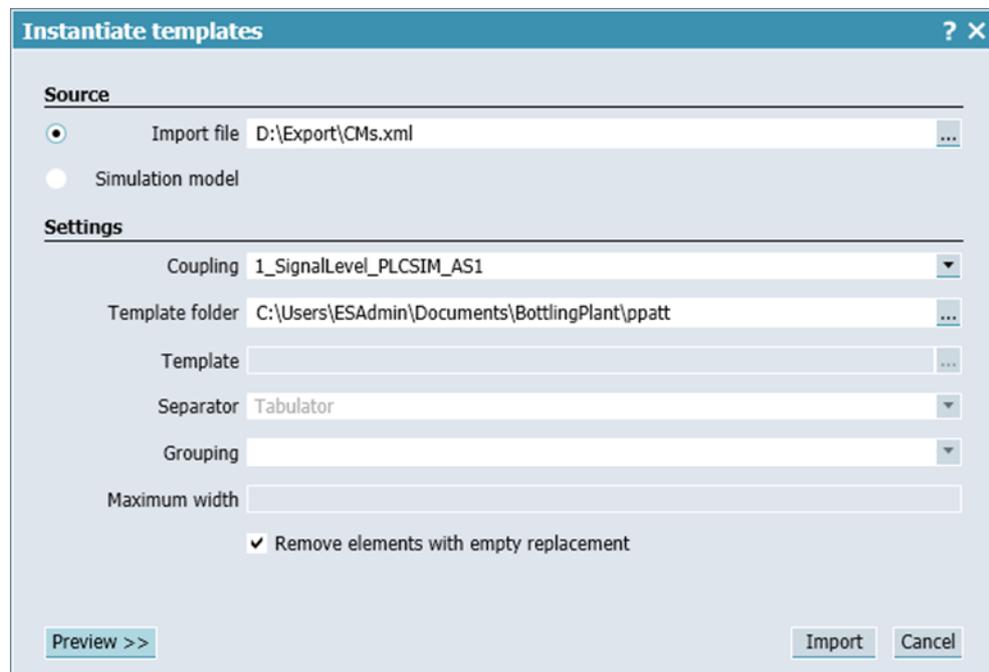
<https://support.industry.siemens.com/cs/ww/en/view/77362399>.

2.8 Import of the software to SIMIT

In SIMIT different automatism are available to create and edit a simulation (diagram). The automatism are based on engineering data which have a format readable by SIMIT. The files contain the information needed to generate or modify charts. This information is automatically converted into charts when the corresponding file is imported.

With the "Instantiate templates" you can instantiate templates. To do this, the CMTs must be exported from PCS 7 or PAA as XML files. Since the templates and the CMTs have the same name, the diagrams are generated from the templates and the placeholders are replaced by the correct connectors.

By selecting "Remove elements with empty replacement", placeholders in the SIMIT template that do not have an instance-specific value for the respective CM from the export file can be deleted for that instance. This represents a possibility to realize different variants of a CMT during the instantiation in SIMIT.



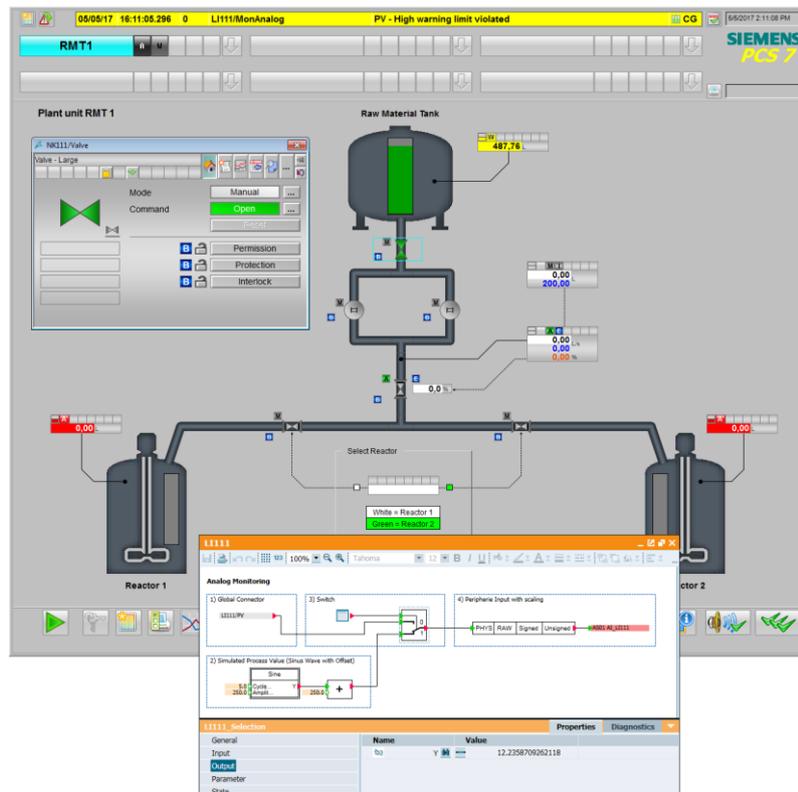
Detailed instructions for a CMT import from PCS 7 to SIMIT can be found in the application example "[Simulation with SIMIT and SIMATIC PCS 7 using a practical example](#)".

2.9 Testing at device level

The complexity of PCS 7 projects is increasing due to higher demands on the availability and individuality of the systems. In this context, the testing effort of automation programs is constantly increasing. An example is the checking of system statuses and the correct recording of feedback signals from actuators and sensors. The provision of feedback or the system state is very laborious or not possible without a suitable tool. SIMIT enables the simulation of signals, devices and process states. In addition, testing is carried out within the framework of a simulation without any risk, since, in contrast to a real test, no dangerous conditions can arise in the area of the systems.

In real applications, the automation system sends control signals to the actuators, e.g. drives of pumps or valves, or it receives and processes the process values of the sensors, e.g. level gages. These signals can be simulated in SIMIT. This makes it possible to test run-time behavior (e.g. opening a valve) and feedback (e.g. reaching limit switches). This increases the quality of the simulation and has the advantage that you can implement the automation software in the real plant with a high level of quality assurance.

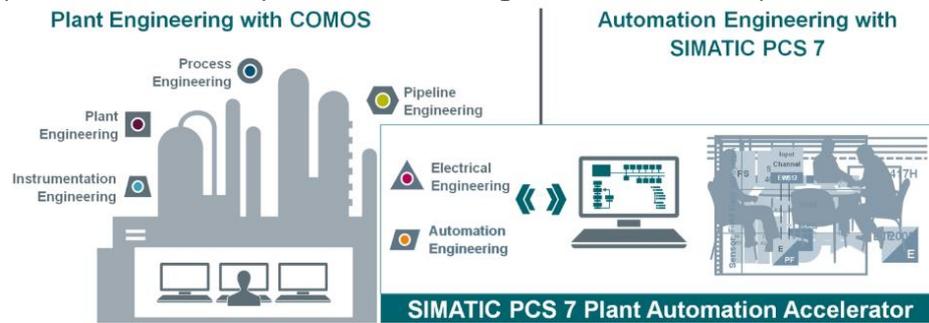
For testing on the basis of the device level, the behavior of the actuators and sensors of the system is mapped in SIMIT, e.g. valves or motors. The behavior of the devices is simulated with prefabricated components and the created templates (see chapter 2.8). These are connected with the signals from the signal level and thus a simulation is made possible as with a real hardware.



3 Useful information

Overview

For planners and automation engineers, PAA also builds the digital bridge between plant planning with COMOS and our SIMATIC PCS 7 control system. The entire plant structure including measuring point data can be easily generated and synchronized between the systems. In addition, PAA ensures more flexible and error-free import and export of documents that are frequently exchanged between plant and automation planners, such as signal or measurement point lists.



		PAA	COMOS
Design & Engineering Phase	Process Design	-	x
	Plant Engineering (PipeSpec, P&ID,...)	-	x
	EI&C Engineering	o	x
	Automation Logic Engineering	x	x
	Automation Hardware Engineering	x	(x)
	Automation Bulk Engineering	x	(x)
	Standard Interface for Data exchange with SIMATIC PCS 7	x	(x)
	Plant Design (3D, Isometrics)	-	x
Operation Phase	Plant Operation	-	x
	Virtual Reality, Field Operator Training	-	x
	Asset Integrity Management	-	x
	Plant and Process Modernization	-	x

(x) PAA Integration Layer for COMOS o Optional

3.1.1 COMOS

The uniform data platform of the COMOS integrated software solution enables plant planners, operators and installers to achieve a seamless flow of information from project-relevant data across all company levels and project phases.

A prerequisite for effective plant management is the optimal networking and coordination of all trades involved in the planning and operation of a plant. The COMOS software solutions provide the basis for worldwide, cross-location cooperation between the various trades over the entire life cycle of a plant.



The object orientation of the COMOS software concept ensures consistent application networking. In COMOS, we describe the graphical and data technical representation of a component in a plant as an object. Associated data sheets, lists and other documents are directly linked to the corresponding objects and form a unit.

The complete plant information is stored in a central database. As a result, COMOS allows all disciplines and departments involved in the engineering and operating phases to always access the same object data. Objects can be processed in COMOS bidirectionally on data sheets as well as in technical drawings. This means that changes to objects or documents are available to every user worldwide at all times, whatever the time zone – providing up-to-dateness and consistency. The entire plant, right down to the individual components, can be examined and further developed from a functional and interdisciplinary perspective.

Common data management enables COMOS to pool data in parallel working processes and workflows.

The open system architecture of COMOS can be adapted to exactly meet company-specific requirements, allows links to third-party systems and can be integrated into existing EDP (Electronic Data Processing) landscapes.

Further information on COMOS and the respective solution packages can be found at [COMOS Product page](#).

COMOS Workflow with the Integration Layer

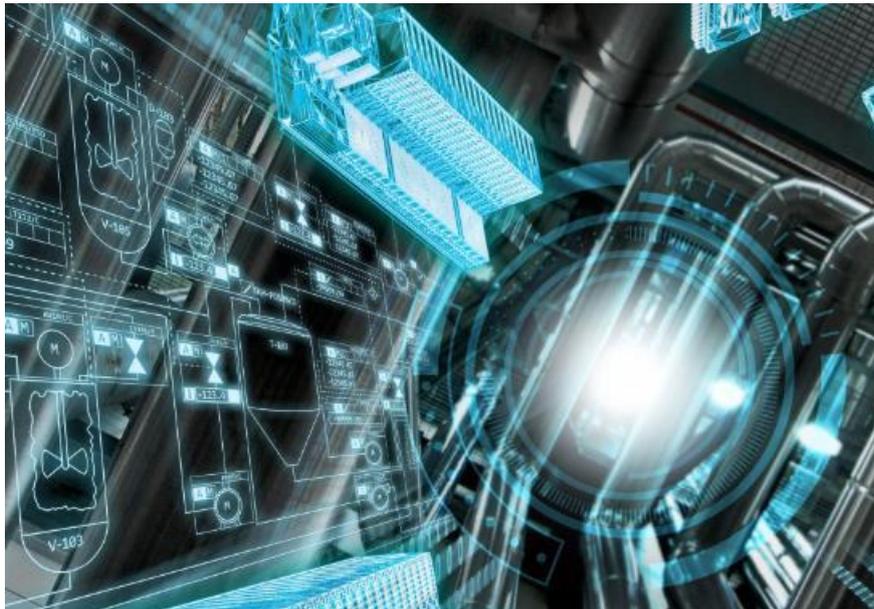
The functionalities of SIMATIC PCS 7 Plant Automation Accelerator offer several advantages for existing COMOS users.

COMOS customers with an existing or planned COMOS installation can purchase the Integration Layer. This contains all PAA functionalities. This provides the SIMATIC master objects supplied as well as all available functionalities for consistent, integrated engineering with COMOS and SIMATIC PCS 7. With the corresponding COMOS licenses, data can be transferred from process design as well as from basic and detail engineering to the control system and vice versa. A combination with other COMOS modules is possible. The Integration Layer can also be used in multi-user mode in an existing COMOS installation.

3.1.2 SIMATIC PCS 7

Uninterrupted operation and consistent product quality with a simultaneous reduction of plant costs are only a few of the challenges faced by the process industry today. The control system plays a decisive role in tackling these many tasks. The SIMATIC PCS 7 process control system makes it possible to react quickly to changing market conditions. It stands for user-friendliness, high system availability, future-proof technology and reduced total cost of ownership.

Processing plants in the process industry have to meet increasingly stringent requirements in terms of flexibility, scalability, availability and security – and maximum future and investment security. In this tension field, digitization opens up completely new perspectives.



Through plant lifecycle times of up to 30 years, lifecycle management is a key issue in the process industry. But how can plants from the past millennium be made economically fit for the digital future? Shorter product development times, continuous efficiency improvements, more flexible production approaches, increased availability, optimized system maintenance or informed decisions based on real-time data: The list of advantages of digitization is long. In order for real and virtual production to blend over the entire life cycle, data integration across all process steps and levels is imperative. The physical basis is formed by flexible and powerful communication networks from the field to the control level.

SIMATIC PCS 7 is based on proven and innovative standard automation components and thus offers perfectly matched products, systems and solutions for integrated, customer-specific automation in all sectors of the manufacturing, process and hybrid industries.

Seamlessly harmonized – Programmed for success:

Central, system-wide, integrated hardware and software project planning with an engineering system in which the project planning of field devices and safety-related applications are integrated. The heart of every SIMATIC PCS 7 project is the SIMATIC Manager. It is an integration platform for the engineering tools and configuration base for the central and system-wide engineering:

The SIMATIC PCS 7 project are created, managed, archived and documented here.

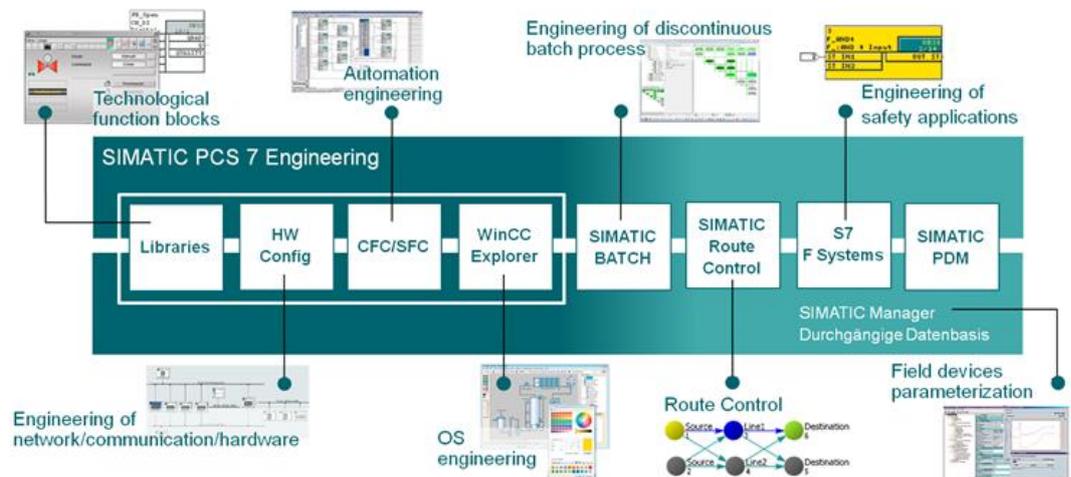
The PCS 7 engineering system offers an SFC and CFC editor for configuring the logic functions. The out-of-the-box function blocks of the Advanced Process Library (APL) support this.

Simple hardware configuration and the universal, manufacturer-neutral PDM tool for configuring, parameterizing, commissioning, diagnostics and service of intelligent field devices (sensors and actuators) and field components enable rapid commissioning and maintenance during operation. The Maintenance Station focuses on plant asset management and contributes to preventive and predictive diagnostics, maintenance and servicing of the plant.

The operator system of the SIMATIC PCS 7 process control system is created in WinCC Explorer. It enables a comfortable and safe management of production processes so that the operator can observe the process sequence and, if necessary, intervene.

SIMATIC PCS 7 Process Historian provides high-performance long-term archiving functionality for perfect integration into the control system: Process data, tags, alarms and batch data from SIMATIC BATCH can be archived centrally in real-time.

The flexibility of the process control system results from scalability according to customer-specific requirements. SIMATIC PCS 7 also offers the right solution for discontinuous processes: With SIMATIC BATCH complex batch processes can be flexibly automated. Route Control is an industry-neutral system for the project planning, control, monitoring and diagnosis of material transports that masters extensive route and pipeline networks. Critical states in systems in which any malfunction of the system itself or of the automation systems could have serious consequences, are detected by SIMATIC PCS 7 with Safety Integrated, a reliable safety system (SIS) at an early stage, so that the system can be returned to a safe state when necessary. This minimizes risks to man, the environment and the plant.



Innovative hardware components are also a significant part of the SIMATIC PCS 7 portfolio.

The SIMATIC PCS 7 automation systems are scalable for all plant sizes and are available in various safety and availability levels. Our modular systems are remarkable not only for their ruggedness, but also for their flexibility. Embedded systems are a combination of hardware and software, ready-to-connect preconfigured for the respective automation tasks.

Whether compact or modular, purely digital I/O interfaces or complete decentralized systems, including integrated drive technology, installed in the control cabinet or directly in harsh industrial environments: the compact peripheral systems are perfectly adapted to the requirements of the process industry - today and in the digital plants of tomorrow! The possibility of plugging and pulling

components during operation particularly benefits high system availability. Station expansion is possible without having to stop the plant.

A change of perspective in the field device connection is also enabled by decentralized peripherals for the efficient transfer of familiar plant concepts into the digital world

The particularly compact and high-availability hardware components support PROFINET - and provide considerably more space for plant planning and operation. PROFINET enables flexible and easily scalable network structures and enormous costs savings throughout the life cycle thanks to a huge reduction in cabling required.

Thanks to the seamless integration of SIMATIC PCS 7 in Totally Integrated Automation (TIA), you benefit from a complete range of optimally matched system components for the end-to-end automation of the entire production process.

You will find additional information about SIMATIC PCS 7 here:

- [Product page](#)
- [Collective page for FAQ, video, application example and manuals](#)

3.1.3 SIMIT Simulation

The SIMIT simulation software enables simulation and emulation for comprehensive testing of automation solutions.

For the first time, the new generation of software relies on a uniform simulation platform with which both the virtual commissioning of automation technology for systems, machines and processes and realistic training environments for plant operators can be implemented. And this quite simply, at the workplace directly, even without equipment or extensive simulation know-how. The creation of a digital image of a plant for the execution of simple signal manipulations up to detailed process simulation becomes possible with it (Digital Twin).

SIMIT offers a modern, clear and user-friendly graphic interface for intuitive operation and fast learning. This makes it possible for automation projects to be implemented faster, more efficiently and safely in the future.

Further information on SIMIT is available here:

- [Product page](#)
- [Collective page for FAQ, video, application example and manuals](#)

4 Additional information

4.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:

www.siemens.com/industry/supportrequest

SITRAIN – Training for Industry

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

www.siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:

support.industry.siemens.com/cs/ww/en/sc/2067

4.2 Links and literature

Table 4-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the entry page of the application example https://support.industry.siemens.com/cs/ww/en/view/109770538
\3\	COMOS topic page https://support.industry.siemens.com/cs/ww/en/view/109739837
\4\	PAA Topic page https://support.industry.siemens.com/cs/ww/en/view/109767120
\5\	PCS 7 Topic page https://support.industry.siemens.com/cs/ww/en/view/63481413
\6\	SIMIT Topic page https://support.industry.siemens.com/cs/ww/en/view/77362399

4.3 Change documentation

Table 4-2

Version	Date	Modifications
V1.0	09/2019	First version