

SIEMENS

SIMATIC

Process Control System PCS 7 PC Configuration and Authorization (V8.0 SP1)

Installation Manual

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system

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Valid for PCS 7 as of V8.0 SP1

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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.

DANGER

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

WARNING

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

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

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Disclaimer of Liability

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Preface

Purpose of this documentation

This documentation provides you with an overview of the PC components used in PCS 7. It contains the following information:

- The PC components you can use for specific PCS 7 applications
- The software and hardware you require for specific PC components.
- The licenses you require for individual products.
- The potential PC configurations for an application.
- How you can set up and configure your PC network.

This documentation is intended for persons involved in configuration, commissioning, and service.

Options for accessing PCS 7 documentation

Note

PCS 7 Readme

The information given in the *PCS 7 Readme* on the Internet takes precedence over all the PCS 7 manuals. Please read this *PCS 7 Readme* carefully; it contains important information and amendments on PCS 7.

- The *PCS 7 Readme* on the *Process Control System; SIMATIC PCS 7* DVD contains important information regarding PCS 7 and takes precedence over the PCS 7 documentation supplied.
 - After installation of PCS 7, you will find the document *Process Control System PCS 7; PCS 7 Readme* in the submenu **SIMATIC > Product information > <Language>**.
-

Basic documents in this documentation

The basic documents in the PCS 7 documentation may be found at the following locations:

- On the SIMATIC PCS 7 DVD in the "_Manuals" folder.

Current version of the documentation

As of PCS 7 V8.0, you receive basic PCS 7 system documentation with the *Process Control System; SIMATIC PCS 7* DVD.

The PCS 7 Internet site www.siemens.de/pcs7-dokumentation (www.siemens.com/pcs7-documentation) provides convenient access to the complete PCS 7 documentation. You can find the following for the latest PCS 7 versions:

- In the section "Hardware manuals for SIMATIC PCS 7 ..."
 - The manuals for components approved for a PCS 7 version
- In the section "Software manuals for SIMATIC PCS 7 ..."
 - The complete system documentation
 - The separate setup program for PCS 7 documentation and the PCS 7 help system for download. After the installation of the setup program, you will find the documentation at the following locations on the Engineering Station:
 - As online help (CHM file) for the SIMATIC Manager application
 - As a PDF file in the Windows Start menu with the SIMATIC documentation
 - The complete documentation for PCS 7 as a *Manual Collection*

Required basic knowledge

To understand this documentation, you should be familiar with automation engineering and process control engineering.

You should also have experience of using PCs and similar (for example programming devices) and the Windows operating system used.

Conventions

In this documentation, the names of elements in the software interface are specified in the language of this documentation. If you have installed a multi-language package for the operating system, some of the designations will be displayed in the basic operating system language even after you change the language and will, therefore, differ from the designations used in the documentation.

Changes compared to the previous version

Below, you will find an overview of the most important changes in the documentation compared to the previous version:

- Customization for Windows 7

PC components of a PCS 7 system

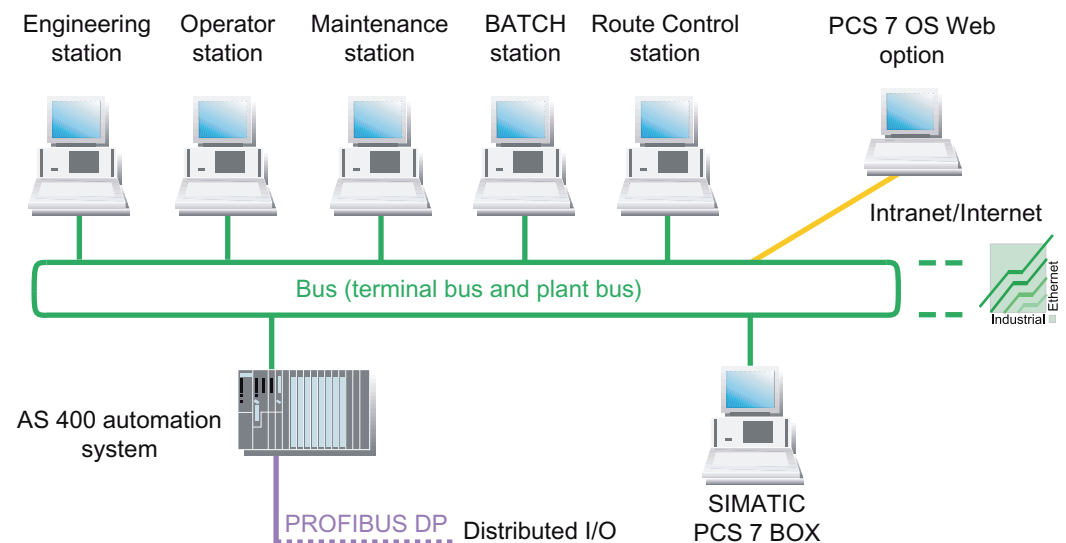
2.1 Basic configuration of the PCS 7 system

Overview

In a PCS 7 plant, PC components are used for the following stations:

- Engineering stations (ES)
- Operator stations (OS)
- Maintenance station (MS)
- BATCH stations (BATCH)
- Route Control stations (RCS)
- Stations for connecting SIMATIC PCS 7 to the SIMATIC IT environment

PCS 7 refers to these stations collectively as "PC stations". The following figure outlines the most important components in a PCS 7 plant.



Legend for figure

Station	Function
Engineering station (Page 13)	You configure and download all system components of PCS 7 with the engineering station: Operator stations, BATCH stations, Route Control stations, automation systems, central and distributed I/O. Engineering stations are PCs on which the PCS 7 engineering software is installed for the configuration of a PCS 7 project.
Operator station (Page 14)	The operator station is used to operate and monitor the PCS 7 system in process mode. You connect the operator station to the plant bus to enable the required data communication with the automation system. Operator stations are PCs on which the PCS 7 OS software is installed. The operator station can be designed as a single-station system for smaller plants and less stringent requirements. In larger plants with more stringent requirements, the OS can be designed as a multiple-station system with OS servers and OS clients.
Maintenance station (Page 14)	The maintenance station is based on an operator station (OS). This OS focuses on "Plant Asset Management" and enables diagnostics and maintenance of the plant. When the diagnostics structure is created in the plant hierarchy, an OS is assigned the functions for asset management. The OS functions can be supplemented with diagnostics functions and program packages for a specific plant. Note: The Engineering Station is used as a Maintenance Client. The Maintenance Station accesses SIMATIC PDM when SIMATIC PDM is in use.
BATCH station (Page 14)	The BATCH station is used to operate and monitor batch process sequences in process mode. A connection to an operator station is required for data communication with the automation system. The BATCH station is connected to the terminal bus for this purpose. BATCH stations are PCs on which the SIMATIC BATCH software is installed.
Route Control station (Page 14)	You use a route control station (RCS) to automate the transport of materials and products in a PCS 7 plant. The route control station is connected to the plant bus to provide the required data communication. A connection to an operator station is required to display messages. Route Control stations are PCs on which the SIMATIC Route Control software is installed.
Bus system (terminal bus and plant bus) (Page 42)	The PCS 7 AS, OS, BATCH, RCS and ES components communicate (between and among each other) via a bus system (Industrial Ethernet). In PCS 7 plants, this bus is divided into: • A terminal bus for communication between the following components: – Operator control and monitoring systems (OS, BATCH, RCS) – Engineering station – Higher-level components (for example, MES, office networks) • A plant bus for communication between: – Servers (OS, RCS) and automation systems – Automation systems (SIMATIC connections)
Automation system	The automation system performs the following tasks: • The AS acquires and processes the process tags from the connected I/O (centralized and distributed) and outputs control information and set points to the process. • The AS supplies the operator station with data for visualization. • The AS recognizes operator inputs and returns them to the process.
SIMATIC PCS 7 BOX (Page 34)	A SIMATIC PCS 7 BOX is an industrial PC for small plants. It can encompass the functions of a PCS 7 process control system (engineering, automation, operator control and monitoring) when used in conjunction with distributed I/O.

2.2 Fault-tolerant (redundant) configurations

Introduction

The use of fault-tolerant components in a process control system minimizes the risk of a production downtimes. A redundant design ensures increased availability of a control system. This means that all components involved in the process have a backup and perform a portion of the control tasks.

If a fault occurs or one of the process control system components fails, the still functional redundant component takes over the control task.

Redundancy for PC stations in a PCS 7 plant

You can use redundant components in PCS 7 to ensure high availability of PC stations.

- Note the following properties for redundant server pairs:

Property	Description
Reaction to server failure	In a project with a redundant server pair, the advantage is that if one of the servers fails, operator control and monitoring of the process can continue via the redundant server.
Number of servers	Maximum 12 servers (pairs) in a PCS 7 plant
Behavior from the client perspective	From a client perspective, a redundant server pair behaves like one server.
Configuration	You configure all of the configuration data for one server only. You then download the configuration data to both redundant servers.

- Note the following properties for redundant network components:

Property	Description
Switch over in the event of a terminal bus failure	Approved network adapters are used for a redundant connection of the PC stations to a terminal bus: • PCI network adapters • PCIe network adapters • Onboard network adapters You can find additional information on this in the manual <i>Process Control System PCS 7; Fault-tolerant Process Control Systems</i> .
Switch over in the event of a plant bus failure	One of the following network adapters (communications processors CP) is used for redundant connection of the PC stations to a plant bus. • CP 1623 • CP 1613 You can find additional information on this in the manual <i>Process Control System PCS 7; Fault-tolerant Process Control Systems</i> .
Response to cable failure (disruption in a ring line)	The typical networks in a ring structure in PCS 7 feature cable redundancy. The network remains in operation even if one cable fails.
Response to failure of network adapters of PCs or switches	If you use redundant network adapters and redundant network connections, the network remains in operation even when a network adapter or switch fails.

Recommendations

You should always use redundant server pairs when the availability of the respective application is critical to your PCS 7 plant.

If PC stations of a PCS 7 plant are integrated into a domain, we recommend that you use multiple domain controllers.

Additional information

- You can find information about the client-server architecture in the "Differences between multiple station systems and single station systems (Page 14)" section.
- You can find information on how to activate redundancy in the "Configuring redundancy for redundant servers (Page 90)" section.
- You can find information about activating redundancy for operator stations in the manual *Process Control System PCS 7; Fault-Tolerant Process Control Systems*.
- You can find information about configuring and implementing redundancy for BATCH stations in the manual *Process Control System PCS 7; SIMATIC BATCH*.
- You can find information about configuring and implementing redundancy for Route Control stations in the manual *Process Control System PCS 7; SIMATIC Route Control*.

2.3 Options when working with engineering stations

Working with several PCs

You have a variety of options available when working on engineering stations to engineer PCS 7 systems. You can, for example, use more than one PC when engineering a PCS 7 system if a single PC is inadequate for the job.

The difference between working with multiple PCs when engineering and working with a single engineering station only involves a few steps.

Property	Working with multiple engineering stations	Working with a single engineering station
Area of application	• Medium-sized and large systems • Configuration phases • Spatially distributed configuration of engineering stations	• Small systems • Local operator stations • Training systems
Monitors	1 or 2 recommended	
Combination/ Method	• PCS 7 project engineering with several engineering stations (Page 17)	• Engineering of a PCS 7 project on a single PC (Page 18) • Combination of engineering station and operator station on a single PC (Page 18) • Engineering with SIMATIC PCS 7 BOX: You will find information on this in the manual <i>Process Control System PCS 7; SIMATIC PCS 7 BOX</i>

2.4 Differences between multiple station systems and single station systems

You can configure each PCS 7 application for process mode, for example OS, BATCH, RCS, Maintenance Station, as a single-station system or a multiple station system with client-server architecture.

Definition of a multiple station system

A multiple station system is a system of related PCs in which the functionality of a PCS 7 application in a client-server architecture is distributed over several PCs, for example, OS clients and OS servers. The Process Control System; SIMATIC PCS 7 DVD provides the associated client or server software for this.

In the case of multiple station systems, we recommend that you configure a terminal bus (separate from the plant bus) for data communication between clients and servers.

Definition of a single-station system

A single-station system or "single station" is a PC that provides the entire functionality of a PCS 7 application, for example the operator station. The Process Control System; SIMATIC PCS 7 DVD provides the "single station" software for this.

You can connect single-station systems to the plant bus as well as to the terminal bus (for example, when there are also multiple station systems in the PCS 7 plant).

Properties of multiple and single-station systems

Property	Multiple station system	Single-station system
Areas of application	Medium-sized and large systems	• Small systems • Local operator stations • Training systems
Configuration	Client-server architecture with multiple PCs: • Operator station multiple station system (Page 20) • BATCH station multiple station system (Page 21) • Route control station multiple station system (Page 22) • Maintenance station multiple station system (Page 23)	One PC for all functions of a PCS 7 application: • OS single station system (Page 29) • BATCH single station system (Page 32) • Route Control single station system (Page 33) • SIMATIC PCS 7 BOX stations (Page 34) • Maintenance station single station system (Page 33)
Workstations	Up to 32 workstations per server	1 workstation with a maximum of 4 monitors (depending on the application)

2.4 Differences between multiple station systems and single station systems

Property	Multiple station system	Single-station system
Availability	To guarantee high availability of the PCS 7 plant, you can configure the server as redundant server pairs (PCs): • Operator station – OS server – Archive server (Process Historian or central archive server) – MS server • BATCH station – BATCH server • Route Control station – Route Control server You can find additional information on this topic in section "Fault-tolerant (redundant) configurations (Page 11)".	
Number of servers	Maximum 12 server (pairs) in the PCS 7 plant. The following each count as one server: • Server for multiple station systems (see configuration) • Redundant server pair (see configuration) • Archive server	

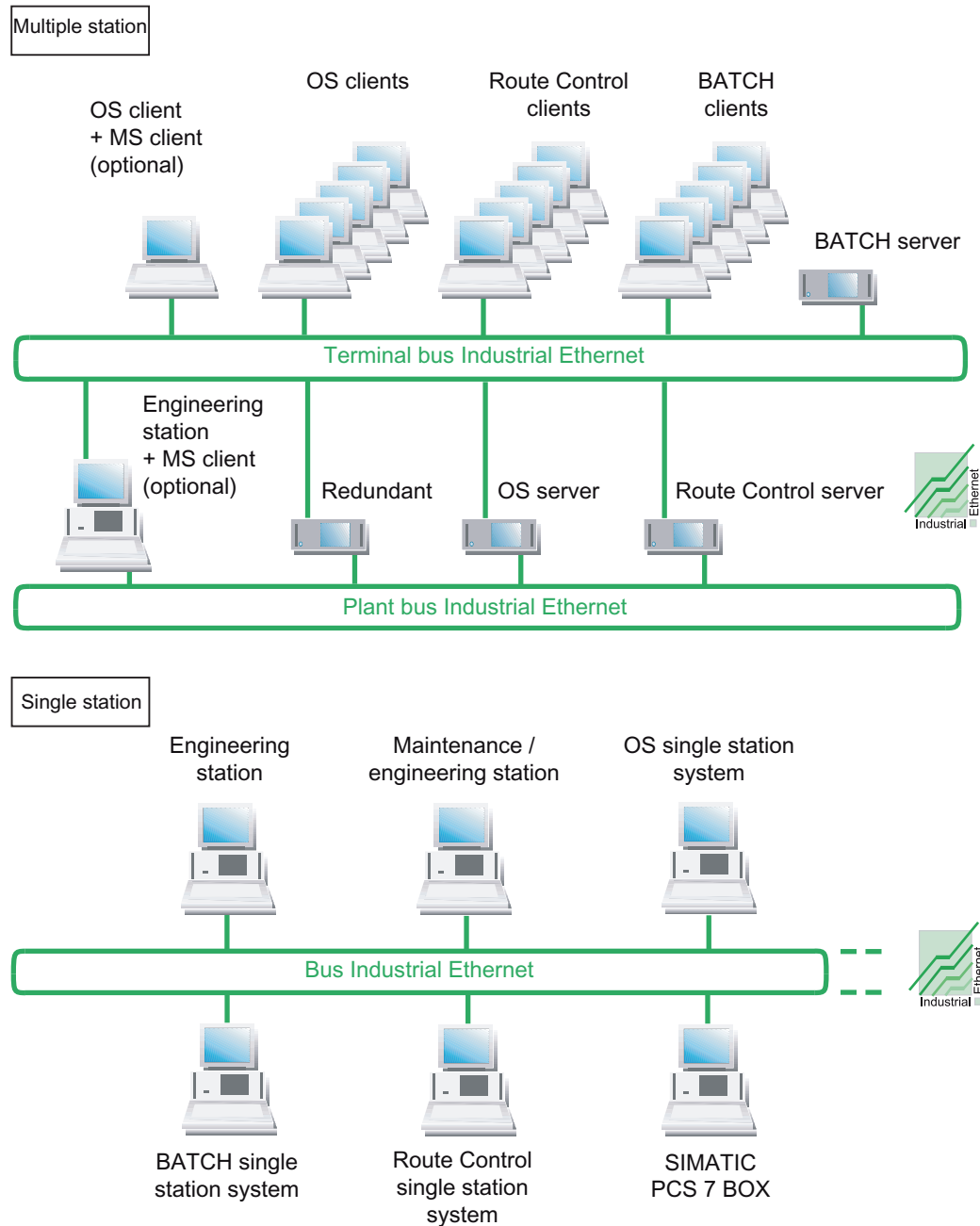
Intranet and Internet connection

You can realize the Intranet and Internet connection via OpenPCS 7 or Web Option for OS.

You can find more information on this in the sections "Remote access via the Web Option for OS (Page 37)" and "Access to PCS 7 data using OpenPCS 7 (Page 39)".

Example configuration

The following example configuration shows the use of multiple station and signal station systems in a PCS 7 plant:



2.5 Solutions for engineering stations

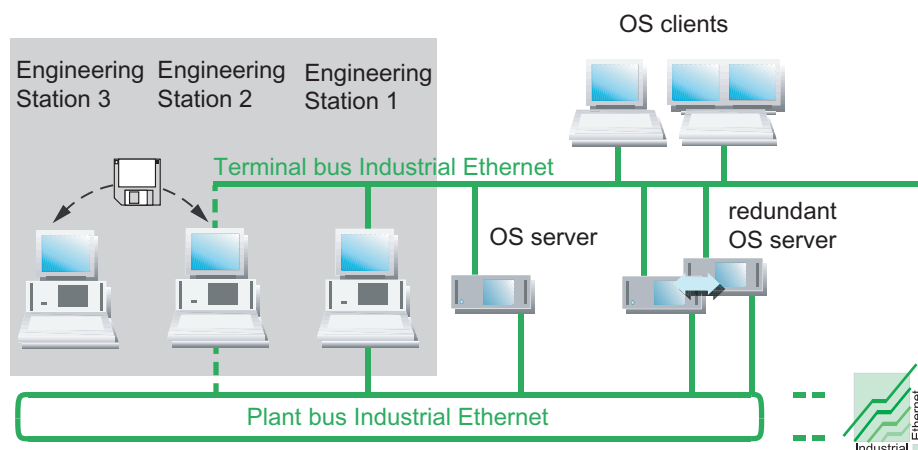
2.5.1 Engineering for a PCS 7 project with multiple engineering stations

Distribution of engineering tasks

You can distribute the engineering tasks for a PCS 7 plant over several engineering stations. PCS 7 provides the following options for this:

Option	Application
Configuring in a multiproject	You can use multiproject engineering to allow several project teams to work on complex projects at the same time. The engineering stations can be connected over a network or be located in separate areas.
Branching and merging charts of a project	You can branch and merge the projects at the chart level (S7 program) to allow several engineers to work at the same time.
Configuring over a network	Several engineers can work on specific parts of a project (for example, AS, OS) stored on a central engineering server at the same time, working from their networked engineering stations.

Example configuration for multiproject engineering



More information

The engineering procedure is described in detail in the Configuration Manual *Process Control System PCS 7; Engineering System*.

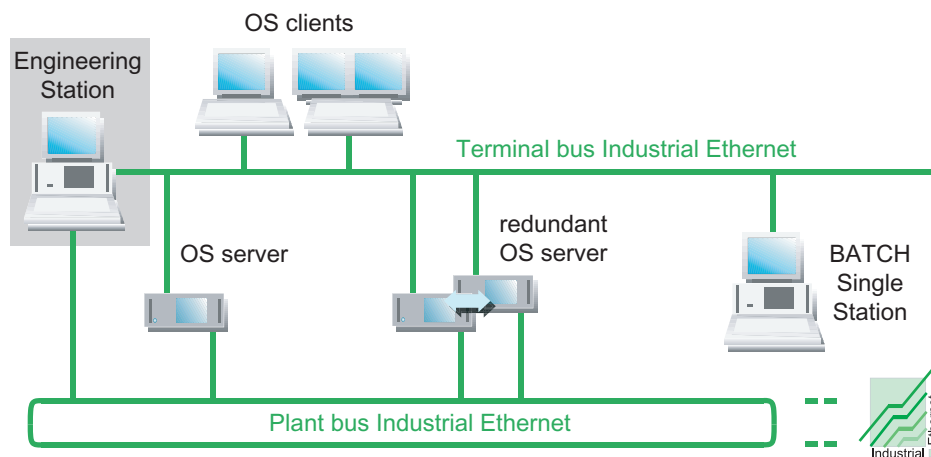
2.5.2 Engineering for a PCS 7 project with a single PC

Central engineering

You can configure a PCS 7 system centrally for all PCS 7 applications (OS, BATCH, Route Control, AS) with a single engineering station.

Connect the engineering station to the plant bus and terminal bus if you want to download the configuration data to the target systems and test it in process mode.

Example configuration



SIMATIC PCS 7 BOX

SIMATIC PCS 7 BOX can also be used as an engineering station for small standalone systems. You can find additional information about this in the manual *Process Control System PCS 7; SIMATIC PCS 7 BOX*.

2.5.3 Combination of engineering station and operator station on a single PC

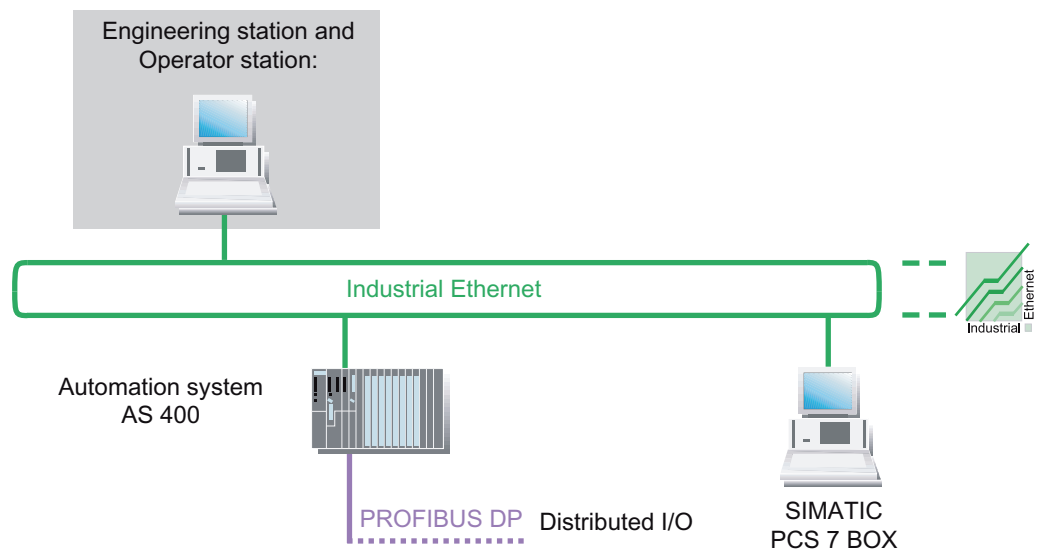
Engineering station and operator station on a single PC

You can configure a small system, such as a training station, centrally for all PCS 7 components, for example with OS, BATCH, Route Control, AS, with a single engineering station.

You can combine the engineering station and an operator station for this purpose. The operator station is configured as a so-called single station system in this case.

The example configuration below shows a plant with a common plant/terminal bus. Various functions are carried out via this bus, for example loading the configuration data to the target systems, testing the system and process mode.

Example configuration



SIMATIC PCS 7 BOX

SIMATIC PCS 7 BOX can also be used as an engineering station for small standalone systems. You will find additional information on this in the section "SIMATIC PCS 7 BOX Stations (Page 34)" and in the manual *Process Control System PCS 7; SIMATIC PCS 7 BOX*.

2.6 Solutions for multiple station systems

2.6.1 Operator station multiple station system

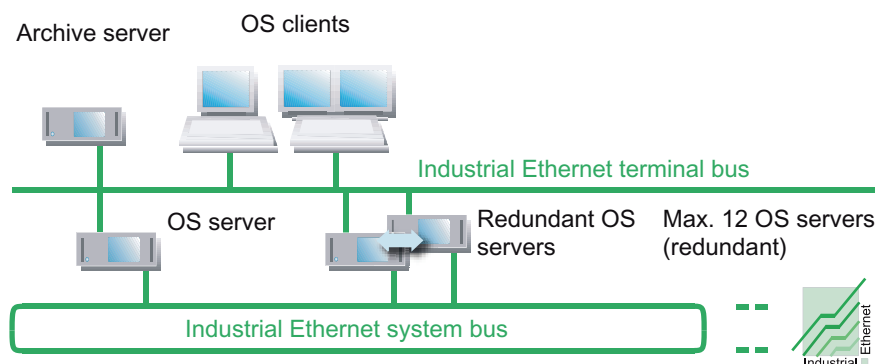
Operator station as multiple-station system with client-server architecture

- The OS multiple-station system consists of OS clients (workstations), which are supplied with data (project data, process values, archives, alarms, and messages) from an OS server (or multiple OS servers) via a terminal bus (OS LAN).
- The OS server can supply process data to up to 32 OS clients.
- The OS clients can access data from up to 12 OS servers simultaneously (multi-client mode).
- Up to 4 monitors can be connected to a workstation (OS client) via a multi-VGA card. You can operate the resulting system areas with a single keyboard and mouse.
- The OS servers feature additional client functions that allow them to access data on other OS servers (their archives, messages, tags and variables). Process pictures from an OS server can then also contain tags of other OS servers.
- You can achieve high availability for the operator station by configuring redundant OS servers or by using more than one OS server with the same configuration. You will need the "SIMATIC PCS 7 Server Redundancy" software package for redundant OS servers.

Note

If you operate no more than four OS clients on an OS server, you can use the OS server as an operator control and monitoring station.

Example configuration



Long-term archive for plant data

As of PCS 7 V8.0, you can choose between several options for central archiving. You will find additional information on this topic in section "External archive server (Page 25)".

Maintenance Station

The Maintenance Station is based on the operator station, with extra functions added for diagnostics. The Maintenance Station can therefore also be structured as a multiple-station system. You can find additional information on this:

- In the section "Maintenance station multiple station system (Page 23)"
- In the configuration manual *Process Control System PCS 7, Maintenance Station*

Multiple station system with "Web Option for OS"

You can access the data of an OS using Internet Explorer if the following conditions are met:

- "Web Option for OS" is installed on one of the OS clients associated with the OS.
- The necessary access rights in the network are in place.

You will find additional information on this topic in section "Remote access via the Web Option for OS (Page 37)".

2.6.2 BATCH station multiple station system

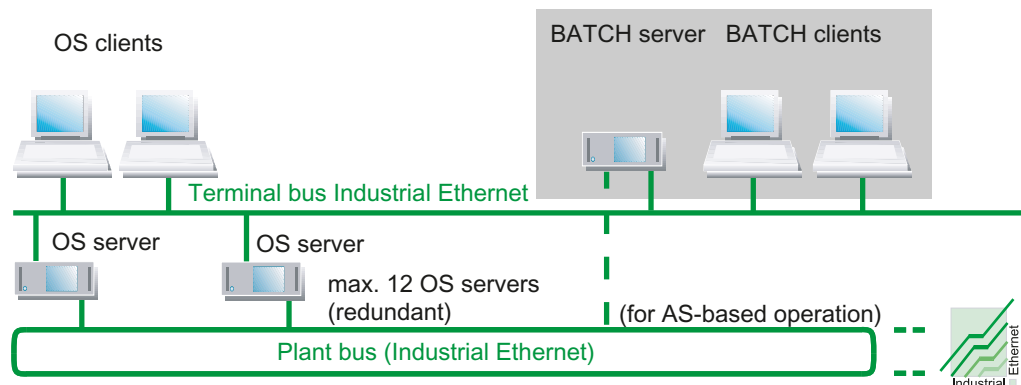
BATCH station as multiple-station system with client-server architecture

- A BATCH station multiple-station system consists of BATCH clients (workstations) that are supplied with data (project data, process values, archives, alarms and messages) from a BATCH server via a terminal bus.
- A BATCH server supplies process data to up to 32 BATCH clients.
- There can only be one BATCH project with one BATCH server in a PCS 7 plant. Only one BATCH project can be activated on a BATCH server.
- You can use a BATCH client to operate and monitor several PCS 7 systems. To do this, start several BATCH client applications on the BATCH client and select different batch projects at the start (each with one BATCH server). It is advisable to use a multi-VGA card for such instances.
- You can achieve high availability for the PCS 7 system by configuring a redundant BATCH server. In terms of the number of servers in a PCS 7 project, a BATCH server set up as redundant is considered a BATCH server.

Note

If you operate no more than four BATCH clients on a BATCH server, you can use the BATCH server as an operator control and monitoring station.

Example configuration



AS-based operation

If AS-based recipes are configured in BATCH projects, it is essential that the BATCH server is connected to the plant bus.

2.6.3 Route control station multiple station system

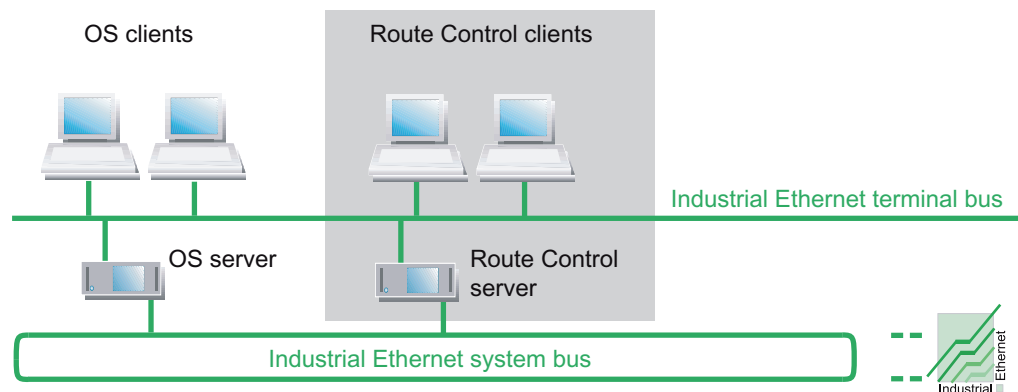
Route Control station as multiple station system with client-server architecture

- A route control station multiple station system consists of route control clients (workstations) that are supplied with data (project data, process values, archives, alarms and messages) from a route control server via a terminal bus.
- A route control server supplies process data to up to 32 route control clients.
- There is only one route control project with one route control server in a PCS 7 system (even when redundant).
- The route control server requires a connection to an OS to store messages.
- Up to 4 monitors can be connected to a workstation (route control client) via a multi-VGA card. You can operate the resulting system areas with a single keyboard and mouse.
- You can achieve high availability for the route control station by configuring a redundant route control server. In terms of the number of servers in a PCS 7 project, a redundantly configured route control server is counted as a single route control server.

Note

If you operate no more than four route control clients on a route control server, you can use the route control server as an operator control and monitoring station.

Example configuration



2.6.4 Maintenance station multiple station system

Introduction

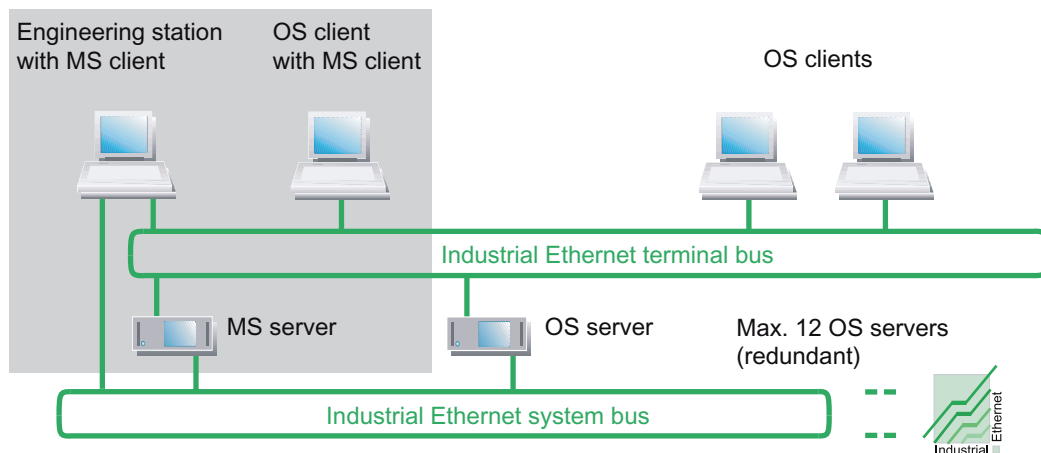
The Maintenance Station is used for the diagnostics and asset management of a PCS 7 plant.

Maintenance Station as multiple-station system with client-server architecture

The Maintenance Station as a multiple-station system consists of the following components:

- Maintenance server (MS server for short)
The MS server concentrates the picture information and data required for system diagnostics on one PC. The MS server needs the following data to display information, such as project data, alarms, messages on the MS client:
 - Server data from the OS servers
 - Configuration of the network componentsYou can achieve high availability for the Maintenance Station by configuring a redundant MS server.
- Maintenance client (MS client for short)
The MS client uses diagnostic screens to visualize the diagnostic status and provides required operator control and monitoring functions.
 - The engineering station or an OS client can be used as the MS client.
The online status of the hardware can be determined if the MS client is installed on the Engineering Station.
 - Up to 4 monitors can be connected to a MS client via a multi-VGA card. You can operate the resulting system areas with a single keyboard and mouse.

Example configuration



Notes on installing the Maintenance Station

Note the following points during installation:

- The MS server is an OS server configured for system diagnostics.
- The MS client can be used on the engineering station or an OS client. You can find configuration instructions in the configuration manual *Process Control System PCS 7; Maintenance Station*.

You can find additional information about installation in the section "How to install the PCS 7 software (Page 84)".

Note on the use of a dedicated Maintenance Station on a redundant, fault-tolerant plant bus

When connecting an MS server on a separate PC station via two standard network adapters, for example, Intel Desktop adapters, to a redundant plant bus, keep in mind that the IP addresses of the ring devices in ring 1 and ring 2, as well as the two standard network adapters connected to these rings, must be located in different IP address ranges.

Example:

- Ring 1
 - IP address range: 192.168.1.0 - 192.168.1.255
 - Subnet mask: 255.255.255.0
- Ring 2
 - IP address range: 192.168.2.0 - 192.168.2.255
 - Subnet mask: 255.255.255.0

Additional information

- Appendix "Approved configurations (Page 154)"
- *Process Control System PCS 7; Maintenance Station Manual*

2.6.5 External archive server

The external archive servers are used in PCS 7 for long-term archiving of diverse plant data from PCS 7 in a central database. You can choose between the following options in PCS 7 V8.0 and higher:

- Process Historian and Information Server
- Central archive server

An external archive server is a node on the terminal bus and is not connected to the plant bus.

Overview of external archive servers

	Process Historian and Information Server		Central archive server
	Process Historian	Information Server	
Function	Central long-term archiving system	Central system for creating and distributing reports based on the data stored in the Process Historian	Central long-term archiving system
Saving data	from various PCS 7 projects		from one PCS 7 project
• Messages and process values	Archiving		Archiving
• OS reports			Archiving
• BATCH reports	Archiving		Archiving
Displaying data	possible at any time	possible at any time	of completed segments with StoragePlusViewer
• Display of messages using filter functions		possible	possible
• Showing BATCH reports		Report as PDF file	
• Filtering BATCH data		Using SQL functions	No filtering
Saving archive data to external media	Manually		possible automatically
Exporting process values			
• via WinCC controls	• CSV file • XML file		• CSV file • XML file
• Report formats		• PDF file • RTF file	
Importing process values		Import add-in for Excel on any computer	
Displaying archive data via the Web		• IS is Web server	
Redundant configuration	• In planning		possible

Note

Installation of the external archive server

Note the following points during installation:

- For performance reasons, install the external archive server (central system for long-term archiving) on a separate PC.
 - We recommend a RAID system for data security.
-

Note

Installation of the Information Server

As of PCS 7 V8.0 SP1, you can install the Information Server on the following PC stations:

- On a separate PC
 - on a Process Historian
 - on an OS server
-

Access protection

You can configure access protection with user-specific rights on the external archive server.

Additional information

- Central archive server:
 - Online help for StoragePlus
- Process Historian and Information Server
 - Documentation *SIMATIC HMI; SIMATIC Process Historian*
 - *SIMATIC HMI; SIMATIC Information Server* documentation

2.6.5.1 Long-term archiving with the Process Historian and Information Server

Functions of the Process Historian

You can perform the following functions with the Process Historian:

- Archive messages and process values from PCS 7 OS
- Archive batch data from SIMATIC BATCH
- Export archive data to external storage media

Functions of the Information Server

- Integrating and creating reports from Office products (Excel, Word, PDF)
- Display the archive data of a batch
- Web-based representation and generation of reports

Additional information

- Documentation *SIMATIC HMI; SIMATIC Process Historian*
- Documentation *SIMATIC HMI; SIMATIC Information Server*

2.6.5.2 Long-term archiving with the Central Archive Server (CAS)

Introduction

"CAS", the central archive server, is an external archive server and is used for long-term archiving of various plant data from PCS 7 in a central database. You can use the Central Archive Server to manage the following archive files:

- From operator stations
 - Swapped out measured values and messages from the OS archives, OS reports
- From SIMATIC BATCH
 - Batch logs in PDF format (optional)
 - Batch data in XML format and as SQL record

You can find information on usage in the SIMATIC BATCH documentation

The archive data is made available regardless of process mode.

You can achieve high availability of the central archive server by configuring the central archive server redundantly.

Functions

You can perform the following functions with the central archive server:

- Archive messages and process values from PCS 7 OS
- Archive OS reports
- Archive batch logs from SIMATIC BATCH
- Transfer all archive data to external storage media
- Catalog all archive data
- Display messages using filter functions
- Display the process values in graphs and tables using filter functions
- Export process values as a CSV or XML file

- Display batch logs from SIMATIC BATCH
- Display archive data in a web-based display

Visualization

You can view archive data with the StoragePlus Viewer.

Access protection

You can configure access protection with user-specific rights on the central archive server.

Notes on installing the central archive server

Note the following points during installation:

- To improve performance, install the central archive server on a separate PC.
- We recommend a RAID system for data integrity.

Additional information

StoragePlus online help

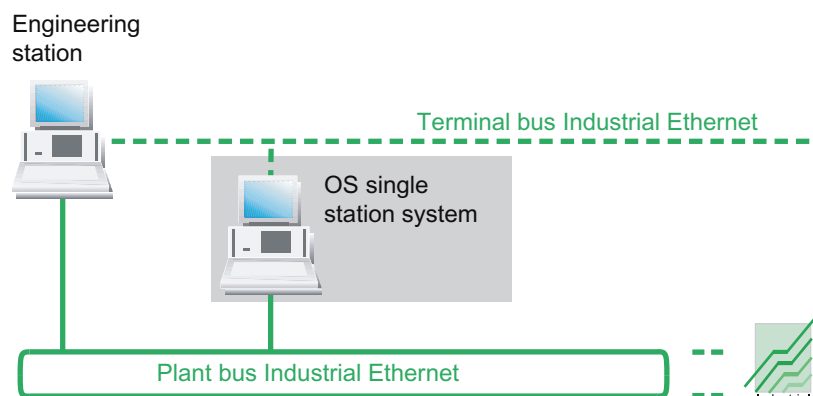
2.7 Solutions for single station systems

2.7.1 OS single station system

OS as single-station system on a single PC

- The OS single-station system is an operator station on a single PC with complete operator control and monitoring functionality for a PCS 7 project (process cell/unit).
- The OS single-station system on the plant bus can be used in parallel with additional single-station or multiple-station systems.
- Select one of the following configurations for more fault tolerance in a single-station system in a PCS 7 system:
 - Configuration with redundant OS single-station system
Install the "OS Single Station Redundancy" license key on each PC station of the redundant pair.
 - Configuration with multiple OS single-station systems with the same configuration
- The OS single-station system can also be used in combination with an engineering station on a PC.
You can find additional information on this in the section "Combination of engineering station and operator station on a single PC (Page 18)".
- You can also use the OS single-station system in combination with an engineering station and an automation system on a PC. This solution is offered as the SIMATIC PCS 7 BOX RTX.

Example configuration



Plant configuration with multiple OS single-station systems

Configurations with OS single-station systems are possible in SIMATIC PCS 7.

The following example shows the maximum configuration for single-station systems:

2.7 Solutions for single station systems

- 1 redundant OS single-station system (single-station system + single-station system standby)
Options:
 - SIMATIC BATCH
 - Web server/client (maximum 3 Web clients per OS single-station system)
 - Communication with OS-internal OPC servers (OpenPCS 7 license required)
- 6 non-redundant OS single-station systems (as reference OS from the OS single-station system)
- Process Historian

Requirements:

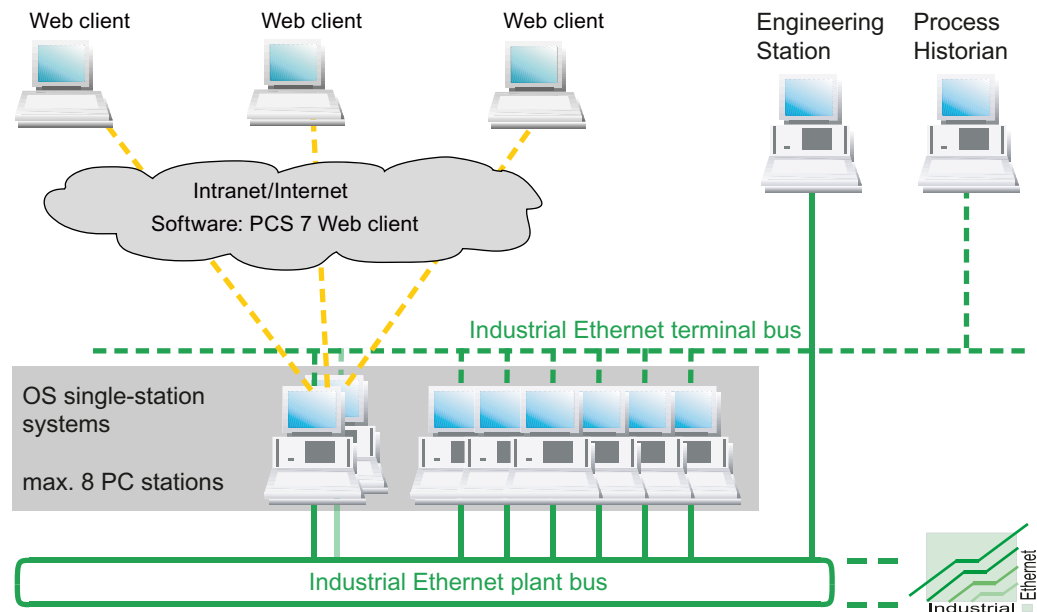
- Operating systems:
 - Windows 7 Ultimate SP1 (64-bit)
 - Windows Server 2008 R2 SP1 Standard Edition (64-bit)
- Automation systems (depending on the firmware version)
 - S7 400 as of firmware version V6
 - S7 400H as of firmware version V6
- Separate engineering station required.

Note

Displaying operator and OS process control messages

Locally generated operator messages and local OS process control messages are displayed on an OS single-station system.

A system-wide overview of the operator and process control messages can be displayed in the Process Historian / Information Server.



Web option for an OS single-station system

You can access the data of an OS using the Internet Explorer. You can find information on this in the section "Remote access via the Web Option for OS (Page 37)".

Exporting archive data to the Process Historian

The archive data of OS single-station system can be exported from PCS 7 V8.0 to a Process Historian. You can find information on this in the system manual *SIMATIC HMI; Process Historian Administration*.

Additional information

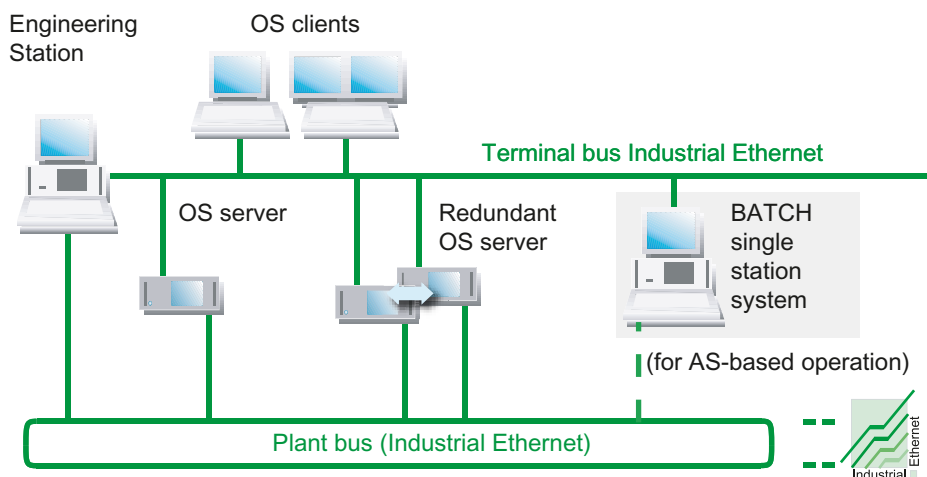
- Section "Combination of engineering station and operator station on a single PC (Page 18)"
- Function manual *Process Control System PCS 7; SIMATIC PCS 7 BOX*

2.7.2 BATCH single station system

BATCH as single-station system on a single PC

- The BATCH single-station system is a BATCH station on a single PC. Complete operator control and monitoring functionality is available for a process cell. A BATCH single-station system is associated with a BATCH project (process cell/unit).
- A connection is needed for the required data communication:
 - In PC-based operation, an interface to the terminal bus is required for coupling to an operator station (OS server) and for the data communication between the automation systems.
 - Two connections are required in AS-based operation:
 - a) A connection to the terminal bus for coupling to an operator station (OS server)
 - b) A connection to the plant bus for coupling the automation systems.
- You use a BATCH single-station system to operate and monitor an entire plant. When several process cells are operated in parallel, an additional BATCH single-station system with corresponding connections to the OS server is needed for each process cell. If you are monitoring several systems, we recommend using a BATCH station multiple-station system (Page 21).
- If several BATCH single-station systems are used: Each BATCH single-station system used must be connected to another OS system.
- You can operate BATCH single-station systems redundantly.
- A connection to an OS server must exist in order to use process mode.

Example configuration



2.7.3 Route Control single station system

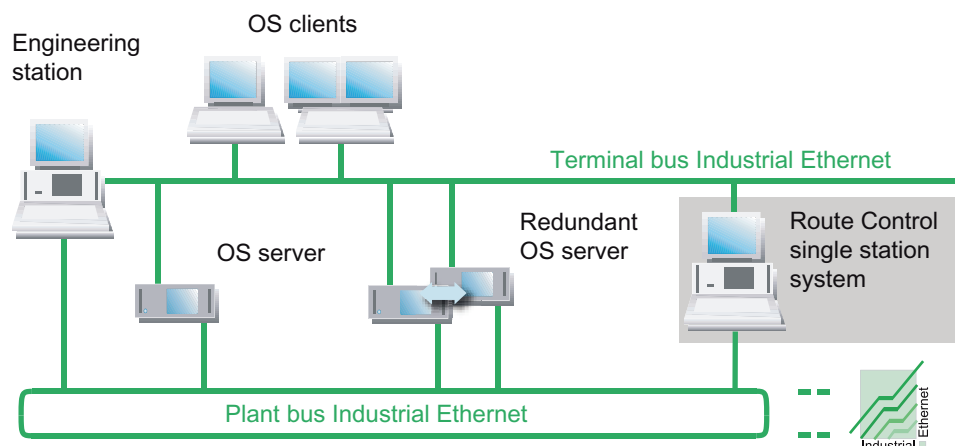
Route Control as a single station system on a single PC

- The route control single station system is a route control station on a single PC. You use the route control single station system to automate the movement of materials and products in a PCS 7 plant.
- You can operate route control single station systems redundantly.
- A connection to an OS server must exist in order to use process mode.

Note

If you use route control single station systems with other route control systems at the same time, the areas controlled by a system must be separated.

Example configuration



2.7.4 Maintenance station single station system

Overview

The Maintenance Station is used for the diagnostics and asset management of a PCS 7 plant.

The Maintenance Station as a single-station system consists of a PC station with engineering station, OS single-station system and Maintenance Station.

Note

Dedicated Maintenance Station on the redundant, fault-tolerant plant bus

If you want to connect a dedicated Maintenance Station using standard network adapters on the redundant, fault-tolerant plant bus, read the information about configuration provided in the documentation *Process Control System PCS 7; Fault-tolerant Process Control Systems*.

Additional information

- Section "Maintenance Station multiple-station system (Page 23)"
- Section "OS single-station system (Page 29)"
- Section "Combination of Engineering Station and Operator Station on a Single PC (Page 18)"
- Appendix "Approved Configurations (Page 154)"
- *Process Control System PCS 7; Maintenance Station Manual*
- Manual *Process Control System PCS 7; SIMATIC PCS 7 BOX*

2.7.5 SIMATIC PCS 7 BOX stations

SIMATIC PCS 7 BOX as a process control system for small plants

A SIMATIC PCS 7 BOX is an industrial PC for small plants. It can encompass the functions of a PCS 7 process control system (engineering, automation, operator control and monitoring) when used in conjunction with distributed I/O.

Area of application

SIMATIC PCS 7 BOX is particularly suitable for use at the process level in small plants:

- Small applications in production
- Self-contained package units
- Automation of a laboratory or research facility

SIMATIC PCS 7 BOX PCs work with the standard PCS 7 system software as a full member of the SIMATIC PCS 7 family. They are scalable and expandable without sacrificing compatibility.

SIMATIC PCS 7 BOX product variants

SIMATIC PCS 7 BOX is available with the following PC variants:

Product name	Variant	AS selection	Description
SIMATIC PCS 7 BOX RTX	PC station with integrated AS	Integrated: Software CPU (WinAC RTX)	SIMATIC PCS 7 BOX RTX enables ES/OS or OS operation. WinAC RTX 2010 supports up to 2000 AS process objects (PO).
SIMATIC PCS 7 BOX	PC station with external AS	SIMATIC PCS 7 AS*RTX	SIMATIC PCS 7 BOX enables ES/OS or OS operation. WinAC RTX 2010 supports up to 2000 AS process objects (PO).
		AS im S7-300 Design / SIMATIC PCS 7 S7-mEC	
		AS 41x of the series SIMATIC S7-400	SIMATIC PCS 7 BOX enables ES/OS or OS operation. The maximum AS configuration limit depends on the type of AS 41x.
		AS 41xH of the series SIMATIC S7-400H (optionally with S7 F system)	SIMATIC PCS 7 BOX enables ES/OS or OS operation. The maximum AS configuration limit depends on the type of AS 41xH.
SIMATIC PCS 7 BOX	Only PC station	No AS	SIMATIC PCS 7 BOX enables ES/OS or OS operation.

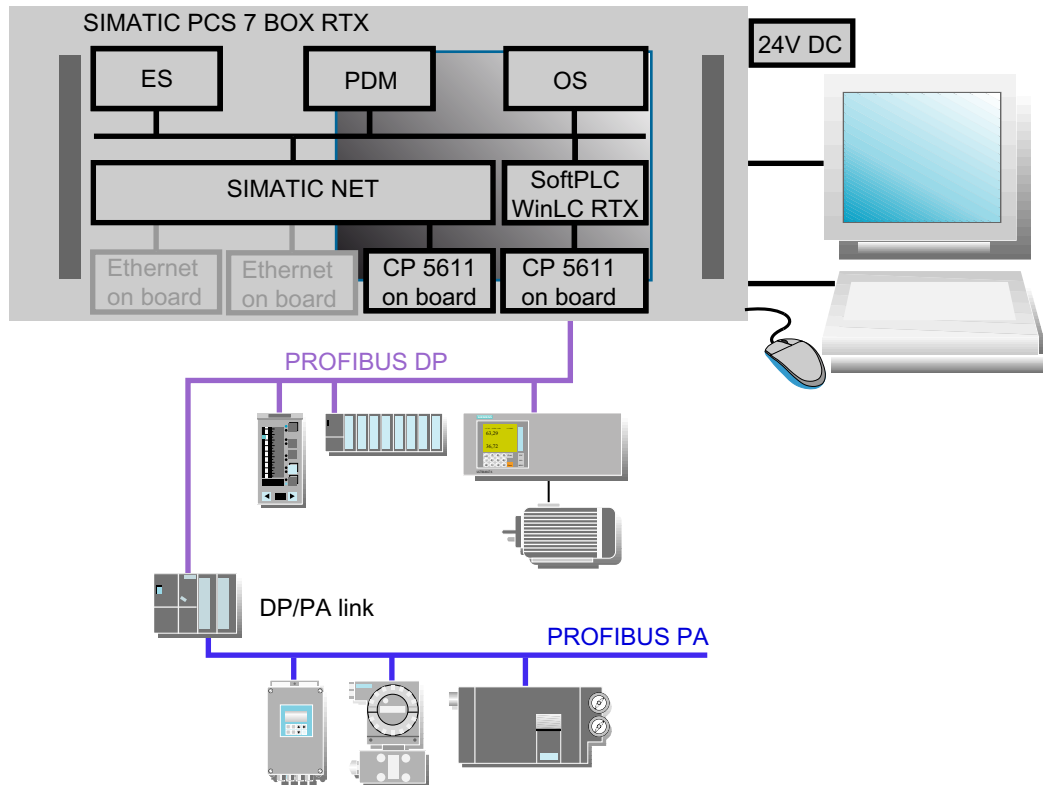
Add-on packages

You can find the ordering information for product bundles in the *ST PCS 7* catalog.

- Licensing
- SIMATIC PCS 7 BOX as a maintenance station.
- SIMATIC PCS 7 BOX with separate, external controller for SIMATIC BATCH
- SIMATIC PCS 7 BOX as Web server for up to two Web clients

Example configuration

The following figure shows an example of a SIMATIC PCS 7 BOX RTX as a complete system with AS, ES, OS and connected distributed I/O.



Licenses

You can find information on licenses for the components of the process control system and possible plant sizes in the document *Process Control System PCS 7; Licenses and configuration limits*. This document is only available on the Internet via Technical Support.

Additional information

- Section "Selecting the correct license keys (Page 114)"
- Manual *Process Control System PCS 7; SIMATIC PCS 7 BOX*
- Catalog *ST PCS 7*

2.8 Solutions for accessing PC stations

2.8.1 Remote access via the Web Option for OS

Remote access with Web Option for OS

The Web Option for OS enables operator control and monitoring of automated processes over the Intranet/Internet using PCS 7.

The Web Option for OS consists of two components:

- **PCS 7 Web server**
Within an OS, the PCS 7 Web server is an OS client with Web server functionality.
The PCS 7 Web server can function as a "Web server" or a "Web diagnostics server".
- **PCS 7 Web client**
These operator stations access project data available on the Web server via the Intranet/Internet. The PCS 7 Web client can function as a "web client" or a "web diagnostics client".

Client for process control

The following options have been approved for process control with PCS 7 Web client and PCS 7 Web diagnostics client:

- WinCCViewRT
Installed with the installation of PCS 7 Web client/PCS 7 Web diagnostics client.
- Microsoft Internet Explorer

Configurations in PCS 7 plants

The following configurations are possible when you use Web Option for OS in a PCS 7 plant:

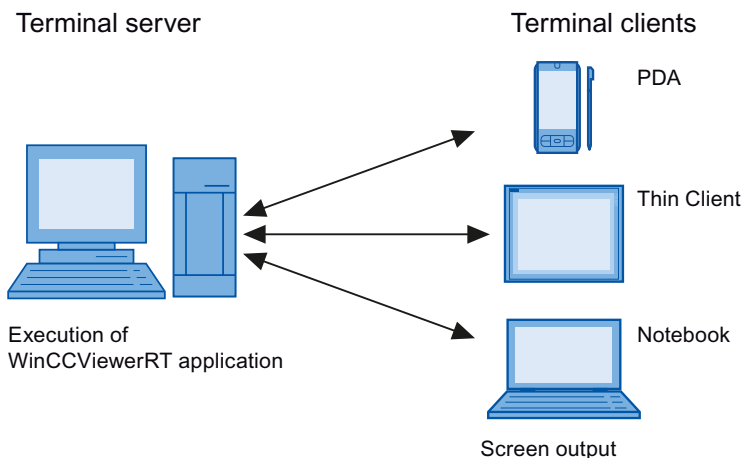
- For an OS multiple-station system
 - Configuration with PCS 7 Web server and PCS 7 Web client
- For an OS single-station system
 - Configuration with PCS 7 Web server and PCS 7 Web client
 - Configuration with PCS 7 Web diagnostics server and PCS 7 Web diagnostics client

Additional information

- Manual *Process Control System PCS 7; Web Option for OS*

2.8.2 Remote access via terminal services

In addition to remote access via the Web Option for OS, remote control can be performed on a PCS 7 plant with local PC systems (terminal client based on the Web Option for OS).



A terminal server must be installed in the PCS 7 plant to enable this access option. The terminal server can be installed on the following PC stations:

- Separate PC
- In a multi-station system on a Web server

A terminal client opens a process (terminal session) for operation on the terminal server.

Note

Combined Web and terminal server (Windows Server 2008 R2 operating system only)

You have to increase the number for the combined Web and terminal server based on the maximum number of terminals clients you want to connect.

Advantages

- Use of robust hardware with low memory requirements for the clients, for example, no fan is required and the hard drive can run in a dusty environment.
- Use of mobile clients with limited power consumption, for example, handhelds, palmtops, PDA.
- Simple and centralized administration and system maintenance.
- All applications are located on the server in a secure environment.
- Support of a variety of operating systems, for example, Windows CE, Windows 98.

Additional information

- Information on terminal services is provided in the system manual *Process Control System PCS 7; Web Option for OS*.
- You can find information on terminal services in the system manual *WinCC; Web Navigator*.
- You can find information about redundant plant configurations with terminal services in the appropriate Microsoft documentation.

2.8.3 Access to PCS 7 data using OpenPCS 7

OpenPCS 7

Data from a PCS 7 plant can be made available to third-party systems using OLE DB or OPC via a PC station with OpenPCS 7, a so-called Open PCS 7 station.

You can use OpenPCS 7 at the following levels:

- Automation level
- Plant control and production control levels
- MES level (Manufacturing Execution Systems)
- ERP level (Enterprise Resource Planning)

Configuration of the OpenPCS 7 station

The OpenPCS 7 station is a PC on which a server for OPC and OLE/DB is installed.

The OpenPCS 7 station performs the following tasks:

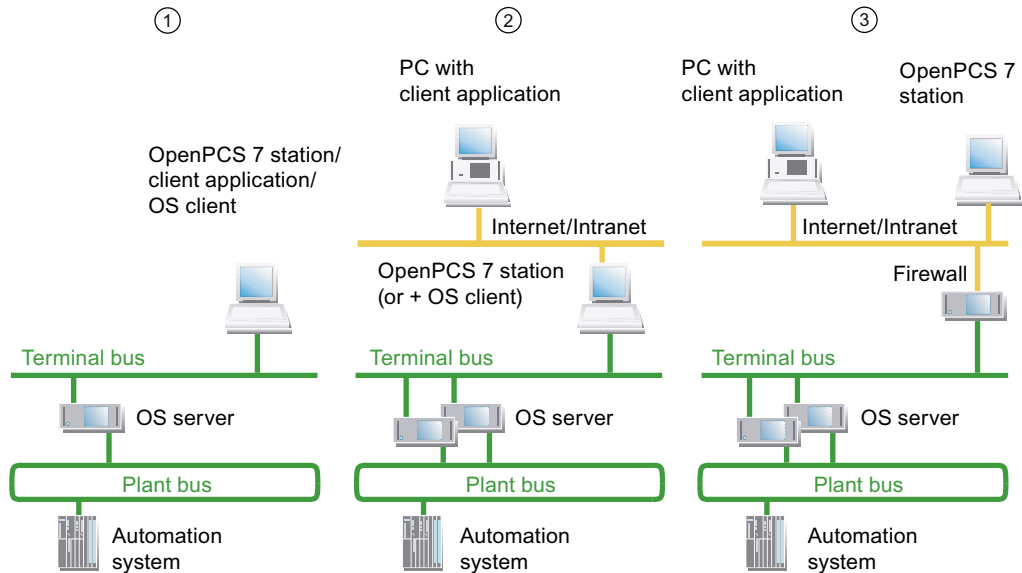
- It makes the PCS 7 data of the automated process available over the OPC interface.
- It allows the client applications (OPC or OLE DB) to access the available PCS 7 data.

The OpenPCS 7 station is connected to the PCS 7 plant via the terminal bus.

In process mode, the OpenPCS 7 station communicates with the automation systems via the operator station (OS server).

Examples of configurations

Typical configurations with OpenPCS 7 are shown in the following figure.



No.	Configuration	Area of application
1	OpenPCS 7 station, OS client, and client applications (OPC or OLE/DB) on a shared PC	Single station system: Recommended for small systems
2	OpenPCS 7 station and client applications (OPC or OLE/DB) on separate PCs connected by an additional network (Internet/Intranet in the figure). With this configuration, the OpenPCS 7 station can also be installed on an OS client.	Multiple station system with client-server architecture: Recommended for medium-sized and large systems
3	OpenPCS 7 station and client applications (OPC or OLE/DB) on separate PCs connected by an additional network (Internet/Intranet in the figure) and access the terminal bus of the PCS 7 plant protected by a firewall.	Multiple station system with client-server architecture: Recommended for medium-sized and large systems

OpenPCS 7 can also be installed on the following PC stations:

- OS single station system
- OS server
- Central archive server "CAS"

Interface formats

The client applications access data on the OpenPCS 7 station via interfaces.

OpenPCS 7 uses the following interface formats for data communication:

- OPC DA (Data Access)
- OPC A&E (Alarm and Event and Historical Alarm and Event)

- OPC HDA (Historical Data Access)
- OLE/DB (integration of data in applications that support OLE (for example, MS Office))

You can find additional information on this in the *Process Control System PCS 7; Engineering System* manual.

Additional information

- *Process Control System PCS 7; OpenPCS 7* manual
- *Process Control System PCS 7; Engineering System* manual
- *Process Control System PCS 7; Operator Station* manual

2.9 Connecting PC stations

2.9.1 Tasks of terminal bus and plant bus

Overview

With PCS 7, the AS, OS, BATCH, Route Control and ES communicate via a bus system, based on an industrial Ethernet.

The bus system in PCS 7 consists of:

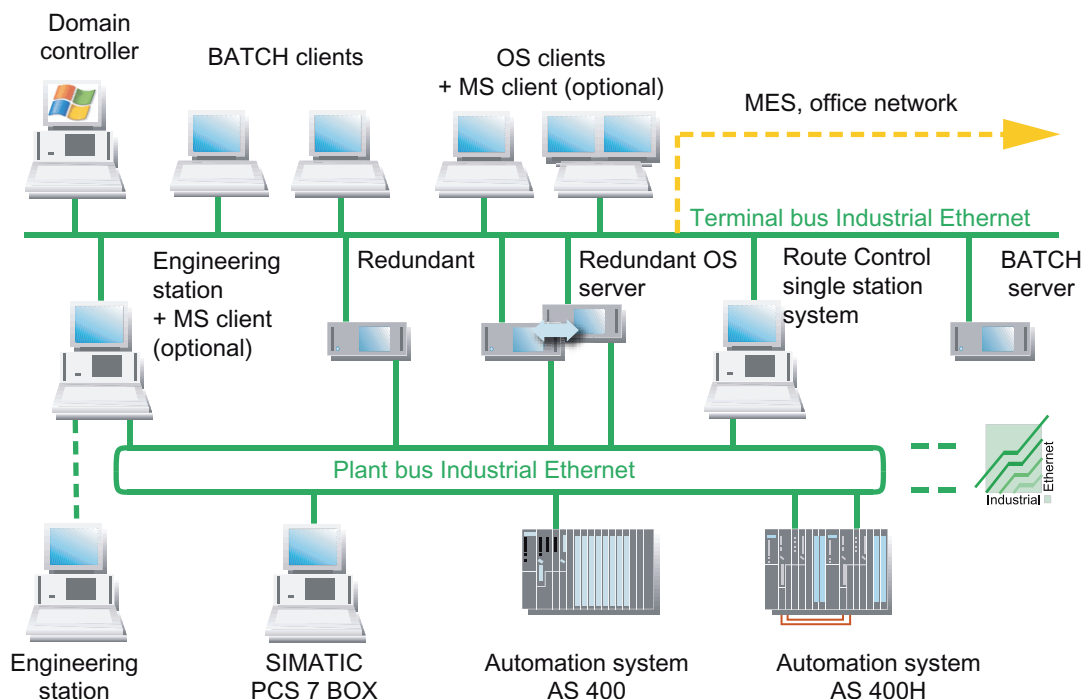
- Terminal bus
- Plant bus

In multiple station systems we would recommend separating the terminal bus and plant bus. In small systems, a bus system with a shared plant/terminal bus can be used.

You can find additional information on this in the section "Differences between multiple station systems and single station systems (Page 14)".

A description of an example for a small system is available in the section "Combination of engineering station and operator station on a single PC (Page 18)".

Example configuration



Topology

The terminal bus and plant bus can be configured as follows:

- As Industrial Ethernet (10/100 Mbps and 1 Gigabit/s)
- Bus, tree, ring, star or redundant ring structures

Data communication

- Terminal bus

The following table shows data communication in the PCS 7 plant.

PCS 7 is also connected to components at higher levels, for example MES level and office networks, via the terminal bus.

Data communication	Between the following components:
Download of the configuration data	Engineering station and the following stations: • Operator control and monitoring systems (OS server, OS clients) • BATCH stations (BATCH server, BATCH clients) • Route Control stations (Route Control server, Route Control client)
Communication between the servers	• OS servers • BATCH servers and OS servers relevant to BATCH
Transmission of data processed by the servers to the operator control and monitoring stations (clients)	• OS server and OS clients • BATCH server and BATCH clients • Route Control server and Route Control clients

- Plant bus

Data communication	Between the following components:
Download of the configuration data	Engineering station and automation system
Operating and monitoring of the processes	Automation systems and OS server, Route Control server communication path: CPU -> CP -> BUS -> network adapter (CP) -> OS/RCS Note: Communication with SIMATIC BATCH is from the OS server to the BATCH server via the terminal bus.
Communication between automation systems (SIMATIC communication)	Automation systems Communication path: CPU -> CP -> BUS -> CP -> CPU

Additional information

- You can find information on the following topics in the Configuration Manual *Process Control System PCS 7, Engineering Station*:
 - Cables and network components
 - Distances between the components of a PCS 7 plant
 - Topology, operating ranges and parameters
- Section "Basic configuration of the PCS 7 system (Page 9)"
- Section "Components for connection to the terminal bus/plant bus (Page 51)"

2.9.2 Connection to the terminal bus/plant bus

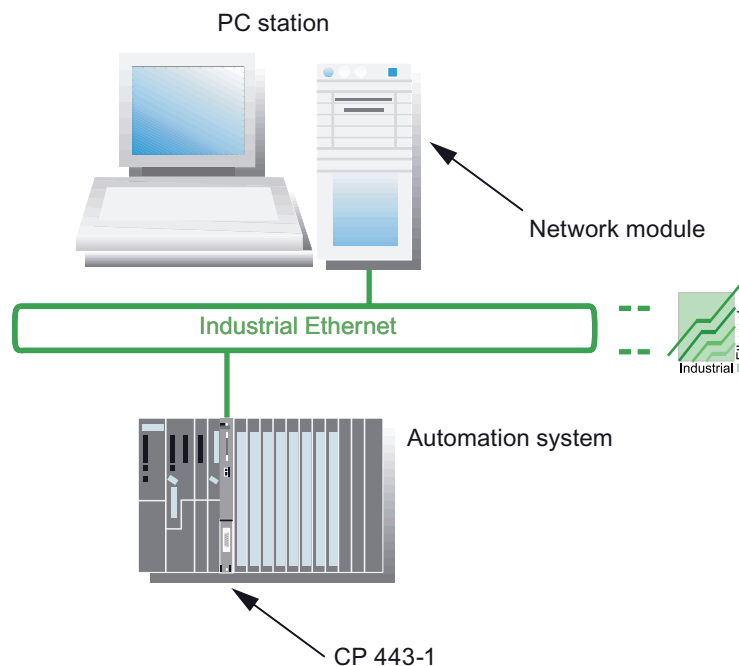
Attachment of OS, BATCH, Route Control and ES

You connect operator stations, BATCH stations, route control stations and engineering stations to Industrial Ethernet using PCS 7 communications modules. The communications modules use a slot in the PC/PG. You use different communication modules depending on your requirements.

Additional information

You will find an overview of the communication modules available in the section " Components for connection to the terminal bus/plant bus (Page 51) ".

Example configuration



Connecting the AS

You connect automation systems to Industrial Ethernet using the CP 443-1 communications processor or the CPU's Ethernet interface. The protocols used are TCP/IP, ISO, and UDP.

Cables and network components

You can find information on the following topics in the configuration manual *Process Control System PCS 7, Engineering Station*:

- Cables and network components
- Distances between the components of a PCS 7 system

Redundant bus systems

You can use redundant communication paths in PCS 7. You can find information on this in the Function Manual *PCS 7; Fault-Tolerant Process Control Systems*.

2.9.3 Connecting PC Stations via Wireless LAN

Connecting a PC station via Industrial Wireless LAN (IWLAN)

Industrial Wireless LAN (subsequently referred to as WLAN) allows you to integrate mobile or stationary PC stations via an access point in a PCS 7 plant. You can integrate the following PC stations:

- OS clients
Up to 2 OS clients (via WLAN)
- Web clients
Up to 2 web clients on a PCS 7 web server (via WLAN)
- PC station
A PC station for remote access to an engineering station
You can find additional information on this in the "Remote diagnostics functions (Page 139)" section.

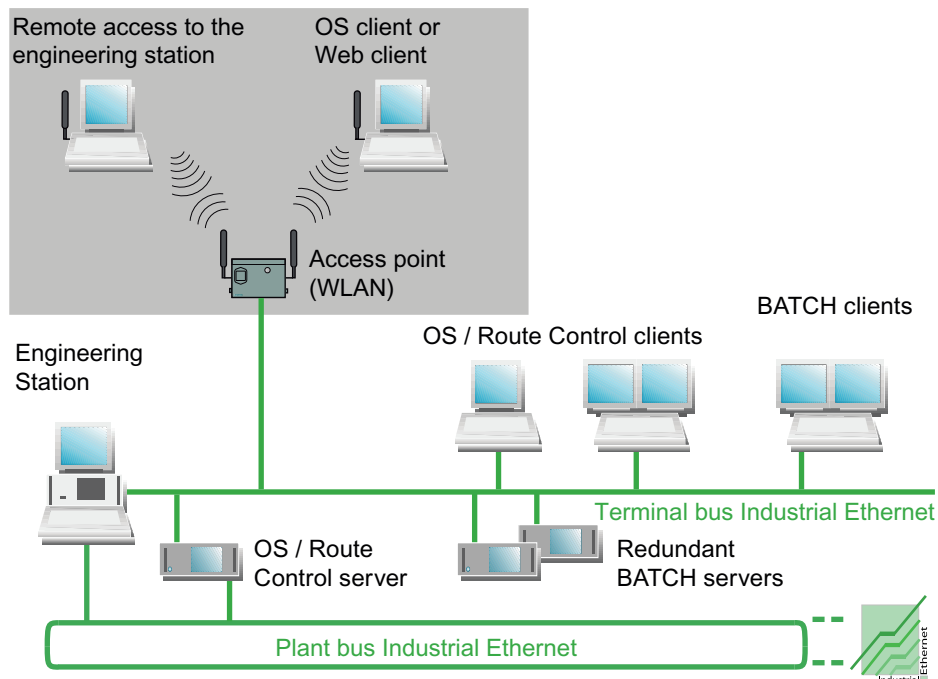
Components for WLAN in PCS 7

The *PCS 7 - Released Modules* documentation lists the network and PC components that are approved for WLAN in PCS 7.

After installing PCS 7 you can find the *PCS 7 - Released Modules* documentation in the Start menu, in the SIEMENS SIMATIC documentation folder.

Example for WLAN in PCS 7

The following figure show a basic configuration of WLAN components in a PCS 7 plant.



Additional information

You can find detailed information on WLAN components, installation guidelines and settings in the following documentation:

- Product Information *Process Control System PCS 7; PCS 7 - Released Modules*
- Operating instructions of SIMATIC NET released WLAN components (see Product Information *Process Control System PCS 7; PCS 7 - Released Modules*)
- System manual *SIMATIC NET; Basics - Industrial Wireless LAN*

2.9.4 Time synchronization

System-wide Time Synchronization

To obtain process data that can be evaluated, all the components of the process control system need to work with an identical, synchronized time of day. This allows you to assign messages in the correct sequence over time. The result is then consistent regardless of the time zone in which the messages originate.

One system component must be the clock for all other components so that all process control system components work with an identical time. The PCS 7 component that functions as timer is referred to as the time master. Components such as the central plant clock SICLOCK or an OS server can be configured as the time master.

The time master is responsible for distributing the time signal to the PCS 7 components to be synchronized, for example, operator stations and automation systems.

Synchronization options

The following table below shows the PCS 7 components for which time synchronization is possible:

Station	Synchronization
Operator station and maintenance station	PCS 7 internal synchronization The time master can be on one of the following networks: • On the terminal bus • On the plant bus
BATCH station	In the case of installation without OS, no synchronization via PCS 7.
Route Control station	You have the following options for synchronization, for example: • Synchronization via DCF77-client • Synchronization via the domain controller as the time master on the terminal bus
SIMATIC PCS 7 BOX	PCS 7 internal synchronization is possible. The method used depends on the product variant (Page 34) (operator station or AS)
AS	• Synchronization via the plant bus

2.9 Connecting PC stations

Station	Synchronization
Domain	• Synchronization via the domain controller as the time master on the terminal bus
Time master	• The time master is integrated in a PC or connected to the Ethernet network as a bus component. • The time master can be any device which can transmit a time signal via the Ethernet networkAdditional information (a PC, for example).

Additional information

You can find detailed information on time synchronization in the *Process Control System PCS 7; Time Synchronization* manual.

Hardware for PC stations

3.1 Preconfigured PC systems for PCS 7 (product bundles)

PC hardware for engineering stations (ES) and operator stations (OS)

Special versions of the basic hardware (product bundles or bundle PC) are available for engineering stations (ES) and operator stations (OS).

The bundle PCs are preconfigured PC systems for PCS 7, which have been optimized for the specific area of application.

The preconfigured PC systems that are available for PCS 7 can be found in the current *ST PCS 7* catalog under the keyword "Entry level systems".

We recommend SIMATIC PCS 7 BOX PCs for use in small standalone systems or for combined AS/OS stations in the PCS 7 network.

You can find additional information on this in the *Process Control System PCS 7; SIMATIC PCS 7 BOX* manual.

If you use other types of PCs for PCS 7, you can find the relevant hardware requirements in the "Basic hardware configuration (Page 50)" section.

Color monitors

Choose a suitable monitor for PCS 7:

- Using standard monitors: minimum resolution 1280 x 1024
- Using widescreen monitors: minimum resolution 1680 x 1050

The higher resolution allows you to better utilize the display features of the PCS 7 software, for example, for the online operation of faceplates from the libraries. Note that suitable drivers must be available.

Network connection

All PCS 7 product bundles are configured for a Windows workgroup.

If you include preconfigured PC systems in a Windows domain, you need to reactivate the security settings using the PCS 7 setup.

You can find more detailed information on security settings in the "Notes on installing PCS 7 (Page 81)" section.

Additional information

- Catalog *ST PCS 7*
- Catalog *ST PCS 7.1* (add-ons for SIMATIC PCS 7)

3.2 Basic hardware configuration

Information in the readme file

Read the latest information that accompanies each new PCS 7 version in the document *Process Control System PCS 7; PCS 7 Readme* on the SIMATIC PCS 7 DVD.

Additional information

- Catalog *ST PCS 7*
- Catalog *ST PCS 7.1* (Add-ons for SIMATIC PCS 7)

3.3 Components for connection to the terminal bus/plant bus

Attachment of OS, BATCH, Route Control and ES

You can connect the following PC stations to Industrial Ethernet via network adapters (network cards or communications processors):

- Operator stations
- BATCH stations
- Route Control stations
- Engineering stations

The network adapters occupy a slot in the PC or programming device (PG). Different network adapters are used depending on requirements.

Note

Bundle PC

Observe the requirements for the PC components. You can find information on this in the *PCS 7 readme*.

Connection to the terminal bus

For connection to the terminal bus:

- Standard communication modules (for example, Intel® Gigabit CT Desktop Adapter)
- Variants for the redundant connection of the PC station to a terminal bus:
 - Parallel Redundancy Protocol
 - Team mode

Check, using the product documentation, whether the communication modules are suitable for the implementation of the concept in question for the terminal bus.

You can find additional information on this in the manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*.

Connecting to the plant bus

- We recommend the standard communication modules in the bundle PC for connecting the plant bus and communication connections to a maximum of 8 communication partners (automation systems or servers)
- Communication modules with onboard processors are required in the following cases:
 - Connecting to the fault-tolerant plant bus
 - connect 9 to 64 communication partners per Operator Station
 - connect fault-tolerant automation systems
 - Connecting to the redundant, fault-tolerant plant bus
 - Maximum of 64 communication partners (including redundant systems) per operator station

3.3 Components for connection to the terminal bus/plant bus

You can find additional information on this in the manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*.

Connecting fault-tolerant automation systems (S7-400H/FH)

CP 16x3 communications processors and the licensed S7-REDCONNECT software are required for redundant communication with S7-400H/FH .

Firewall on the plant bus

If you use a firewall on the plant bus, you will need a communications processor for the SIMATIC stations from the module range CP 443-1 EX xx (with at least firmware version V2.5.5; EX xx means: EX 10 and above)

Driver

You can find information on the availability of the drivers in the *PCS 7 readme*.

Time synchronization

CP 1623 and CP 1613 support time synchronization on Industrial Ethernet (Fast Ethernet). A PC with CP 1623 /CP 1613 can receive time frames from the following time transmitters:

- SIMATIC S7-400/H/FH with CP 443-1
- SIMATIC NET time transmitter for Industrial Ethernet
(You can find additional information on this in the *IK PI* catalog)
- SIMATIC SICLOCK
- PC with CP 1623 or CP 1613

Licensing for network card with configured terminal bus

Note

If you use a CP 1623 or CP 1613 on the plant bus and configure the terminal bus in NetPro, you will require a BCE license.

See also

Tasks of terminal bus and plant bus (Page 42)

3.4 Optional hardware components

Note

Ordering optional hardware components

You will find hardware components which are suitable and approved for PCS 7 in the *ST PCS 7* catalog.

Be aware of any dependencies on the operating system used and standards for required additional components (e.g. standards for smart cards required).

Overview

Component	Application
Smart card reader	This is used to access the PC stations via chip cards. All authorized users need a chip card.
Printer	Use a graphics-enabled printer or a line printer for message sequence reports. Printers must be supported by the operating system.
Signal module	You can use the signal module to control three visual or acoustic signal transmitters. You assign tags to these three signal transmitters in the WinCC editor "Audible signal device". If a tag has the status "1", the corresponding signal transmitter of the signal module is activated. The signal transmitter is acknowledged/reset via the software or an external acknowledgment on the signal module. A group signal is also available to you on the signal module. The group signal is triggered when one of the three signal transmitters is present and can control an acoustic or visual signal transmitter. Connecting a signal module also facilitates sign-of-life monitoring thanks to the watchdog function.
Sound card	You can use a standard sound card to expand OS single station systems and OS clients. Files, such as a "*.wav", are played back through suitable devices (loudspeakers, piezo transmitters) via the signal module.
Radio clock	This is used to synchronize the PCs and plant bus.
Intrinsically safe operating unit	If required, use an intrinsically safe PC operating unit (add-on product) in hazardous areas, zone 1 or 2 - distances of up to 750 m are possible.
Multi-VGA cards	Install a multi-VGA graphics card in a PC used as: • An engineering station or • A client for an operator station or SIMATIC Route Control This allows you to connect up to four monitors to a PC (for clients and engineering stations).
EPROM programming device USB prommer	This allows you to program SIMATIC memory cards and EPROM modules.
Redundant network adapters	These allow you to connect PC stations to the redundant terminal bus.

Additional information

- Catalog *ST PCS 7*
- Section "Overview of additional devices and drivers for PCS 7 (Page 105)"

3.5 Configuring and ordering

Station configuration software

You can find the configuration editor software that will support you in building your PC networks on the DVD *Interactive Catalog CA01; Automation and Drives Engineering*.

Ordering information

You can find the ordering information for tested PC configurations and software components in the *Process Control System PCS 7; ST PCS 7 Catalog*. The components offered represent the optimal basis for your plant for all areas of application. The catalog offers turn-key solutions.

Custom solutions

For custom solutions for PC systems (for example, RAID systems), contact your Siemens representative in the sales and service locations that are responsible for your company.

You can find your Siemens contact on the Internet (<http://www.siemens.com/automation/partner>).

Installing PC stations

4.1 Overview of the installation procedure

Introduction

Below, you will find a practical outline of the basic procedure for installing PC stations for PCS 7.

Siemens AG offers training courses on PC and network administration. Please contact your regional training center or the central training center for more information.

Security settings

Before the PCS 7 setup program performs the installation, the "Security Controller" dialog box appears. This dialog box displays the system settings that Setup for PCS7 will make on the PC station.

You can find additional information about this in the section "Notes on installing PCS 7 (Page 81)".

Overview of the individual steps for installation

This overview shows the recommended sequence of installation tasks.

Step	What?
Installation of the operating system	
1	Installing the operating system (Page 69)
2	Installing operating system service packs (Page 77)
3	Setting the location where the swap file is to be stored (Page 77)
4	Making system settings (Page 78)
5	Installing the Message Queuing Service (Page 72)
6	Installing additional components (Page 79)
7	Configuring the server function for the central archive server (Page 74)
8	Installing additional services for SIMATIC BATCH (Page 79)
9	Setting the color scheme and font size (Page 78)
10	Creating a backup (Page 80)
Installation of PCS 7	
11	Installing the PCS 7 software (Page 84)
12	Installing the central archive server (StoragePlus) (Page 88)
13	Configuring the redundancy for redundant servers (Page 90)
14	Installing a PC for PCS 7 OS Web Option (Page 90)
15	Activating the firewall in PC stations (Page 96)
16	Installing additional communication modules and PCS 7-specific settings (Page 101)

Installing PC stations

4.1 Overview of the installation procedure

Step	What?
17	Licensing and authorizing the PCS 7 software (Page 110)
18	Preparing PC stations - an overview (Page 124)
19	Creating a backup (Page 80)

4.2 Workgroup and domain

Working environment

You have the option of operating the computers in your PCS 7 plant in a workgroup or domain environment.

The following tables present a comparison of the advantages and disadvantages (from a technical perspective) as well as scenarios (examples) and their use in workgroups and domains.

Note

This information is provided as a basis for discussion to assist you in the selection of the appropriate environment for your computers. In addition to the technical criteria, also consider organizational criteria (for example, plant-specific IT, Microsoft expertise, resources, workload and maintenance, etc.).

Advantages and disadvantages

	Domain (AD; Active Directory)	Workgroup (WG)
General information (in relation to Microsoft Windows)	The user information is stored centrally.	Standard user settings are required at each PC station.
	Central safety database	Local safety database
	Suitable for very large networks (scalability)	Suitable for short distances in the plant and a limited number of PC stations.
	Permissions for devices and files are managed in the AD.	Permissions for devices and files are managed by individual PC stations.
Administrator	The administrator must have comprehensive knowledge (substantially higher qualifications).	The administrator must be familiar with the setup and management of PC stations in the workgroup network.
User accounts, group policies, resources, security	Central administration in the AD.	Distributed administration on each PC station.
Planning	Comprehensive planning is required.	Less comprehensive planning is required.
Number of PC stations	Additional PC stations required to manage the AD. Windows server required to store central security information.	Windows server only required if this is used to set up the infrastructure, for example, as a DHCP server
Use with SIMATIC Logon	• The users set up for the AD are used. • High reliability through the use of redundant domain controllers.	• The users can be managed at a central PC station. • No redundancy is available for the central logon station to be set up.

DHCP server

Note

In PCS 7, the use of a DHCP server is only permitted with address reservation. All PC stations must work with reserved addresses.

DNS / WINS server

The recommended solution for name resolution is the use of a DNS / WINS server.

Scenarios

Scenarios (examples)	Domain (AD; Active Directory)	Workgroup (WG)
New user is added.	The new user is created centrally in the AD and is then available immediately on all PC stations.	The new user must be added on each PC station.
User password is changed.	The password is changed centrally in the AD.	The password must be changed on each PC station.
Add or replace computer	The settings are applied automatically in accordance with the group policies of the corresponding organizational unit.	The settings must be adapted locally on the PC station.
Modify security settings	The settings are changed centrally in the AD and distributed by means of group policies.	All settings must be changed locally.
Microsoft Updates are to be distributed.	The settings for the Microsoft Windows Software Update Service (WSUS) are made centrally in the domain.	The settings for the Microsoft Windows Software Update Service (WSUS) are made at each PC station.
Devices are added (e.g. printer, fax or scanner).	The devices are announced by AD.	Devices not announced. The information for connecting to the device must be known.
	The security settings can be made centrally for each device.	Each user that uses the device must be created locally at this PC station and log on with local user information.
One user uses multiple computers.	The user profile can be saved centrally. This applies the settings to all PC stations at logon.	The user has a local profile on each PC station.
	If the profile is not saved centrally, every user will have their own local profile.	

The lists above are not weighted in terms of importance; you must determine which advantage or disadvantage is the most significant for the PCS 7 plant in question.

Domain example

Changes can be made centrally, fast and conveniently in the domain structure. However, the administration of a domain requires know-how, experience and additional work.

Workgroup example

In the workgroup, the majority of settings have to be made on the local computer. If a PCS 7 plant is running with fixed settings, however, and few changes are expected, these settings only need to be made once. In this case, additional time for creating a domain and providing extra training for the operating personnel is not required.

Note

You have access to the following supplementary documentation via the PCS 7 website www.siemens.de/pcs7-dokumentation (www.siemens.com/pcs7-documentation):

- PCS 7 Security Concept; Recommendations and Notes
 - SIMATIC Process Control System PCS 7; Security concept PCS 7 & WinCC - Basic document
 - SIMATIC Process Control System PCS 7; Support and Remote Dialup
 - SIMATIC Process Control System PCS 7; Patch management and security updates
 - SIMATIC Process Control System PCS 7; Managing virus scanners
-

Integration in a domain

All PCs in the PCS 7 product bundles are configured for a Windows workgroup. If you include preconfigured PC systems in a Windows domain, you must reactivate the security settings using the SIMATIC "Security Controller" software.

4.3 Installing the operating system

4.3.1 Notes on installing the operating system

Introduction

Only appropriately qualified personnel may install the operating system, particularly the servers, and configure networks.

Below you will find information about how to make the settings.

Operating systems

You can find information about operating systems for PC stations on which PCS 7 software is installed in the PCS 7 Readme documentation on the *Process Control System; SIMATIC PCS 7* DVD.

Below you will find the most important information and settings for installing operating systems approved for PCS 7.

You can find additional information in the documentation *Process Control System PCS 7; Licenses and configuration limits*.

Requirements

- All the necessary modules and devices have been installed in your PC.
- Check if you have a 32-bit or 64-bit version of the operating system and whether the PC station is suitable for the operating system.
- Check whether the operating system is suitable for the software that you want to install on the PC.
- Check that you have the product key. Example
PRODUCT KEY: XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
The product key is available in the following places:
 - On the cover of the installation data medium
 - When you purchase software online: In a confirmation e-mail
- Ensure that you know the name of the computer to be configured (name of the PC station in the plant).
- Back up the files of the PC station if you may need them later.
- The installation data is available on a bootable medium.
The description below assumes that the installation is performed from a SETUP DVD.

Integration in networks

You can integrate PC stations for PCS 7 in a network. Note the following:

Note

Install the PC stations locally or in a workgroup. Using this procedure prevents group policies or domain restrictions from hindering the installation.

Do not use the following PC stations in PCS 7 for domain management (as DHCP or DNS server, for example):

- OS server
- BATCH server
- Route Control server

If a server (OS server, BATCH server, Route Control server) is also used as a server for these services, then the PCS 7 functions may be impaired due to overloading of the PC's resources.

NOTICE
Software products of PCS 7
Only install PCS 7 software products listed in this documentation on a PC station. This especially applies to PC stations for process mode (OS, SIMATIC BATCH, SIMATIC Route Control).
Installing and simultaneously activating applications that are not approved by Siemens can adversely impact the PCS 7 system performance.
The user bears sole responsibility when third-party products are used. If you use third-party products, these must be installed before you install PCS 7. PCS 7 and these third-party products should not run at the same time.

Reinstalling and updating

Note the following general information in regard to updating software.

NOTICE

Important information

Please note the following:

- If the operating system for PCS 7 has not been installed on the PC station yet, reinstall the PC. This requires the operating system to be changed.
- Check the suitability of your hardware before performing a new installation. Additional information is available in the file *PCS 7 Process Control System, PCS 7 Readme*.
- Back up your licenses (authorizations and license keys).
- Save your unchanged project and associated data prior to reinstallation (in an image, for example). You can find additional information about this in the manual *Process Control System PCS 7; Service Support and Diagnostics*.
- Make the preparations for updating the software. You can find additional information about this in the manuals *Process Control System PCS 7; Software Update*.
- Back up the data required for the software update.
- Format the hard disks and create new partitions.

Operating system languages

We recommend the following Windows MUI operating systems (Multilingual User Interface) with the following languages and corresponding regional settings:

- German
- English
- French
- Italian
- Spanish
- Chinese

When you use PCS 7, you will have to set the required language and region at every point in the Windows language settings. This affects all the settings available under "Regional and Language Options".

If you use PCS 7 ASIA, make the following settings in the Windows regional and language options:

- For the "Language version of the non-Unicode programs" select "Chinese (PRC)"
- For the "Language used in menus and dialogs", select "English" if you set the language of the PCS 7 user interfaces to English.
- For the "Language used in menus and dialogs", select "English" or "Chinese (simplified)" if you set the language of the PCS 7 user interfaces to Chinese.
- For the "Standards and formats", select "Chinese (PRC)".

If you change the "Language used in menus and dialogs", the character set may not be changed automatically in all cases. We therefore recommend that you go to Control Panel and select the "Windows Classic" style under "Display", "Display Properties", "Appearance".

Note

PCS 7 only supports the main languages (primary language) of the operating system languages, for example English (US), but not English (GB).

Asian version of PCS 7

A "SIMATIC PCS 7 Vx.x Asia" USB dongle is required for each PC to operate the OS stations.

Bundle PCs

The product bundle PCs of PCS 7 are supplied with a multilingual operating system.

The default language is English; the multilingual packages which include German, French, Italian and Spanish are installed.

If you install a PC yourself, we recommend the following when selecting the operating system language:

- If the PC users only use one language, select the operating system language used for configuration/process control.
- If the users use multiple languages on the PC, select a multilingual operating system (English/USA by default) and then install the additional Multilingual User Interface Packs.

Empty web page in Internet Explorer

In some cases, an empty web page opens when you start the Internet Explorer. The set homepage is ignored by the Internet Explorer x.y . There is an attempt to open the Internet site <http://go.microsoft.com/fwlink/?LinkId=74005> to set up the Internet Explorers.

This behavior is a basic characteristic of the Microsoft Internet Explorer. Microsoft offers a solution for this behavior in the Internet under the following keyword: "KB945385"

4.3.2 Hard disk partitioning

Partitioning the hard disks

If you are not using a preconfigured PC from a PCS 7 product bundle, but instead a different type, divide the PC's hard disk into the following partitions to facilitate easy data backup.

- For the operating system and the PCS 7 installation: Minimum 100 GB, see example
- For PCS 7 project data: At least 100 GB, possibly several partitions
- For backups: Back up the projects and archives to media that will not be affected by a failure of the PC or the hard disk with the original data, for example, a DVD or on the network.

If you use a preconfigured PC from a product bundle, the configuration-specific partitions are set up.

Example

Example of the hard disk in a PC station:

Drive letter	Size in GB	Drive name	Formatting	Intended use
C:	100	SYSTEM	NTFS	Operating system installation and PCS 7 installation
D:	x (remaining hard disk space)	DATA	NTFS	PCS 7 project data
Backup files The backup files on the "... " drive are used here as an example. If the backup files are not stored directly on the final backup medium, they can be placed temporarily on drive "C:" or "D:".				
...	100	BACKUP	NTFS	Backup files of another PC station
...	...	Second hard drive or external backup		Backup files of the PC station

Additional information

You can find information about the minimum configuration of the basic hardware in the document *Process Control System PCS 7; PCS 7 Readme*.

4.3.3 Name of the PC station

The selection of the computer name is crucial to the project configuration. You specify the computer name during installation of the operating system on the computer.

Specifying the name of the PC station

Note

Please note when configuring an OS or BATCH server and an engineering station that the following names must be identical:

- Computer name
 - Name of the PC station
-

Select short and descriptive computer names that provide some information about the role of the PC station in the overall system.

Specifications:

- The computer name starts with a letter.
- The computer name must only contain letters and numbers.
- The computer name can contain up to 15 characters (limited by the operating system).

Additional naming conventions

You can find additional naming conventions for projects in:

- Manual *SIMATIC; Process Control System PCS 7; Engineering System*, section "Rules for naming in the PH"
- Online help *WinCC Information system* "Working with projects > Appendix > Invalid characters"
- In the file *Projects.pdf*. You can find this file in the SIEMENS SIMATIC products installation folder.

Changing the computer name

The computer name can no longer be changed after the installation of PCS 7. If the computer name is nevertheless changed, you must perform a new installation (Restore DVD).

Note

Note the following:

- If you want to change the computer name for a bundle PC, perform a new installation with the Restore DVD.
 - If you want to change the computer name for a PC you have installed yourself, perform a new installation of Windows.
-

Changing the computer name before installation of PCS 7

You can change the computer name in the Control Panel.

4.3.4 PC configuration security settings

Introduction

Current production methods increasingly require process control systems and the IT environment to come together. The need to connect company networks to public ones brings with it increased hazard potential. Information system and network security has therefore become an important factor in operating process control systems. Accurate knowledge of the sources of risks and the implementation of measures to prevent these risks from occurring is of utmost importance.

Comprehensive knowledge of administrating Microsoft Windows networks is required if you want to integrate PCS 7 PC stations into a PC network.

Recommendations and instructions

The manual *Process Control System PCS 7; Security Concept PCS 7; Recommendations and Notes* helps Administrators to plan and configure PC networks:

- It will give you an overview of network, computer and user management, as well as the management of user and access rights in PCS 7.
- It will provide you with important information about integrating PCS 7 networks into the Windows management system.
- You will learn what the options are available for time synchronization in a PCS 7 plant.
- You can find information about how to establish patch management and secure communication paths between the PC stations in a PCS 7 plant.

Note

This manual builds on the possibilities of the operating systems used with PCS 7 and assumes the reader has an understanding of administration of these operating systems.

Network

You must isolate the network for a PCS 7 plant via switches, routers, or gateways to ensure that no faults reach the PCS 7 plant, via office networks, for example.

Security settings on a PC

The required security settings are applied on the PC when PCS 7 is installed.

Note

When the PCS 7 plant is operated in a domain, the security settings must match throughout the entire domain. Consult with your administrator to agree upon uniform security settings.

Virus scanners and updates

Virus scanners and updates approved for PCS 7 can be installed later.

Note

Please note that some updates will require you to restart your PC and cannot, therefore, be installed in process mode.

Additional information

- Section "Notes on installing the operating system (Page 62)"
- You can find additional information about the security settings in the following section:
 - Section "Installing security patches, hotfixes, service packs (Page 133)"

- You can find additional information about virus scanners and updates in:
 - Section "Virus scanners (Page 143)"
 - Section "Installing security patches, hotfixes, service packs (Page 133)"
- Document *Security concept PCS 7 and WinCC - Basic Document*
- File *PCS 7-readme*

4.3.5 Installing an operating system

Configuring the operating system

The operating system setup is largely self-explanatory. Below, you will find information about the settings which you need to adjust.

- **Security**
 Take into account the recommendations in the whitepaper; *Security Concept PCS 7 and WinCC*.
 This document can be downloaded from the Internet at the Customer Support (<http://www.siemens.com/automation/service&support>) website:
 - Assign a secure password for the local administrator.
 - You should only make connections to secure networks when connecting to wireless networks. Make the system-specific settings to protect the computer.
- **Specify and format hard drives/partitions**
 You can find additional information on this in the "Hard disk partitioning (Page 65)" section.
 If you want to change the partitions, you may need to delete partitions and create new ones.

Windows 7 Ultimate Windows Server 2008 Windows Server 2008 R2	Windows XP Windows Server 2003 Windows Server 2003 R2
Setup shows the existing partitions.	"Where do you want to install Windows?" dialog > "Drive options (extended)"

- **Computer name**
You can find additional information on this in the "Name of the PC station (Page 66)" section.
- **Licensing the operating system**
Make sure you have the correct number of licenses. Each server requires a server license and a system-specific number of client licenses (CALs).
A PCS 7 server bundle includes five client licenses (CAL).
 - **Client licenses (CALs) for Windows Server 2008 and Windows Server 2008 R2**
The CAL are not registered or recorded in the operating system.
 - **Setting client licenses (CALs) for Windows Server 2003 and Windows Server 2003 R2**
You need to set the licensing mode.

Note

Setting the licensing mode for Windows Server 2003 and Windows Server 2003 R2

The default setting for the licensing mode is: "Per server".

Select the "per device or per user" radio button for the licensing mode if more than one server or more than five clients are present in one area. An "Area" in this context is a subnet, a workgroup or a domain.

Installation of specific language components for a multilingual installation

Windows 7 Ultimate Windows Server 2008 Windows Server 2008 R2	Windows XP Windows Server 2003 Windows Server 2003 R2
1. Open the Control Panel. 2. Select the "Change display language" option in the "Clock, Language, and Regional Options" area. The "Regional and Language Options" dialog box opens. 3. Open the "Keyboards and Languages" tab. 4. Click "Install/remove languages...". 5. Select the option "Browse computer or network". 6. Follow the Setup instructions for the installation. 7. Reboot the PC.	1. Start Setup from the Multilingual User Interface Pack CD. 2. Follow the Setup instructions for the installation. 3. In the "Windows Multilingual User Interface Pack" dialog box, select the languages to be made available in the menus and dialogs (multiple languages can be selected). Select the default language. Select the "Match Language for non-Unicode ..." and "Match the default shell ..." check boxes. 4. Follow the Setup instructions for the installation. 5. Reboot the PC.

Settings made after installation of the Windows multilingual user interface pack

The selected language is English.

Windows 7 Ultimate Windows Server 2008 Windows Server 2008 R2	Windows XP Windows Server 2003 Windows Server 2003 R2
1. Open the Control Panel. 2. Select the "Change display language" option in the "Clock, Language, and Regional Options" area. 3. Open the "Keyboards and Languages" tab. 4. If a language pack is installed, you will see a "Choose a display language" drop-down list in the "Display language" area. 5. Select the desired language from the drop-down list. 6. Reboot the PC.	1. Open Control Panel > Regional Language Options. The "Regional and Language Options" dialog box opens. 2. Open the "Regional Options" tab and make the settings for your specific system. 3. Select the tab "Keyboard and Languages" and make your system-specific settings. 4. Open the "Advanced" tab and make the settings for your specific system. 5. Reboot the PC.

Recommendations

Deactivate games

- **Windows XP**

Select the following options in the Control Panel: Software > Add/Remove Windows Components > "Accessories and Utilities" option > "Details" button > deactivate "Games" option

- **Windows 7 Ultimate**

Select the following options in the Control Panel: Programs and Features > Turn Windows features on or off > deactivate the "Games" option

Disable "Automatic System Restore"

Disable Automatic System Restore for all drives

- **Windows XP**

Select the "Turn off System Restore on all drives" option under **System > System restore** in the Control Panel.

- **Windows 7**

Select **System > System Protection** in the Control Panel and disable system restore.

Additional information

- Section "How to install the Message Queuing Service (Page 72)"
- Section "How to configure the Microsoft Internet Information Service (IIS) for the server (Page 74)"

4.3.6 How to install the Message Queuing Service

Introduction

PCS 7 uses the Microsoft Message Queuing Service. This component is part of the operating system. MS Message Queuing is not included in the standard installation of Windows, however, and must be installed separately, if needed.

You need the installation CD of the operating system for the installation.

Requirement

- You are logged on as an Administrator.

Procedure for Windows 7

1. Select the following options in the Control Panel: **Control Panel > Programs and Features**.
2. Click "Turn Windows features on or off" in the left-hand menu bar. The "Turn Windows features on or off" dialog box opens.
3. Select the component "Microsoft Message Queue (MSMQ) Server".
4. Activate the following option:
"Microsoft Message Queue (MSMQ) Server Core".
 - Deactivate the subcomponents.
5. Confirm with "OK".

Procedure for Windows Server 2008/Windows Server 2008 R2

1. Select the following options in the Control Panel: **Administrative Tools > Server Manager**. The "Server Manager" opens.
2. Click "Features".
3. Select the menu command "Add Feature".
4. Activate the "Message Queuing" option as well as the "Message Queuing Services" > "Message Queuing Server" options below it.

Procedure for Windows XP

1. Select the following option in the Control Panel: **Software**.
2. Click "Add/Remove Windows Components" in the left-hand menu bar. The "Windows Components Wizard" opens.
3. Select the component "Message Queuing".
4. Click "Details".
5. Activate the "Common" subcomponent in the "Message Queuing" dialog box. Deactivate all other subcomponents in the "Message Queuing" dialog box.

6. Select the "Common" subcomponent.
7. Click "Details".
8. Activate the subcomponents in the "Common" dialog box.
Confirm the dialog box and follow the instructions provided by the Wizard.
9. Click "Finish" to close the Wizard.

Procedure for Windows Server 2003/Windows Server 2003 R2

1. Select the following option in the Control Panel: **Software**.
2. Click "Add/Remove Windows Components" in the left-hand menu bar. The "Windows Components Wizard" opens.
3. Select the component "Application server" and click "Next". The "Application server" dialog box opens.
4. Select the component "Message Queuing". The "Details" button is activated.
5. Click "Details". The "Message Queuing" dialog opens.
6. Activate the "Common Components" subcomponent.
7. Disable all other sub-components and confirm with "OK".
8. When the "Disk" dialog box opens, insert the requested Windows Installation CD. Click "OK". MS Message Queuing is installed.
9. Click "Finish" to close the Wizard.

Checking the Message Queuing Service

Use the Event Viewer to check that the Message Queuing Services have been activated correctly:

1. Select the following options in the Control Panel **Administrative Tools > Event Viewer**.
2. In the tree view, select "Event Viewer > Application".

The Message Queuing Service has been installed correctly if the "Source" column contains the entry "MSMQ".

Incorrect function

If an error message appears under "Description" in the "Event Properties" dialog box, the installation has not been executed correctly. Remove and then reinstall "Message Queuing Services".

4.3.7 How to configure the Microsoft Internet Information Service (IIS) for the server

Introduction

The Internet Information Service (IIS) is required to install and use the following PCS 7 PC stations:

- PCS 7 Web server
- Central archive server (CAS) (only with Windows Server 2003/Windows Server 2003 R2)
- Information Server
- PC station where BATCH archives are stored.

Deactivate the service for all other installations.

Requirement

- You are logged on as an Administrator.

Install IIS on Windows Server 2003 SP2/Windows Server 2003 R2 SP2

1. In the Windows Start menu, select the menu command **Settings > Server Configuration Wizard**.
The "Server Configuration Wizard" opens.
Click "Next".
2. No settings are needed on the following page. Click "Next".
3. A process indicator shows the entry of the network settings and is automatically closed on completion. If the Windows firewall displays a security query, click "No longer block" to acknowledge.
4. The server configuration type page is optionally displayed.
Select the "Custom Configuration" option.
Click "Next".
5. On the next page, select the "Application server (IIS, ASP.NET)" item for "Server function".
Click "Next".
6. On the next page, activate the check box for the item "Activate ASP.NET".
Click "Next".
7. Follow the instructions on the screen.

Install IIS on Windows Server 2008 or Windows Server 2008 R2

If you are using the WinCC OPC XML-DA server, you must install the Microsoft Internet Information Services (IIS) prior to the installation.

Under Windows Server 2008 R2, configure the settings in the Server Manager via the "Web Server (IIS)" role for the associated role services.

1. In the Windows Start menu, select the menu command **Settings > Server Manager**.
The "Server Configuration Wizard" opens.
2. Select the local server from the tree structure.
3. Expand "Roles Summary" in the tree structure.
4. Select "Add Roles".
The "Add Roles" wizard opens.
5. Click "Next".
The server roles that can be installed are listed.
6. Select the "Web Server (IIS)" check box. Click "Next".
The installation information is displayed.
7. Click "Next".
The "Role Services" list displays a tree structure.
8. Select the following check boxes:

- For Web servers:

Feature	Option
Common HTTP Features	• Static Content • Default template • Browse Directory • HTTP Errors
Application Development	• ASP.NET • .NET Extensibility • ASP • ISAPI Extensions • ISAPI Filters
Integrity and Diagnostics	• HTTP Logging • Request Monitoring
Security	• Basic Authentication • Windows Authentication • Request Filtering
Performance	• Static Content Compression

- For administration tools:

Feature	Option
IIS Management Console	
IIS Management Scripts and Tools	
Admin Service	
IIS 6 Management Compatibility	• IIS 6 Metabase Compatibility ... • IIS 6 WMI Compatibility

9. Click "Next".
Check your selection.

10. Click "Install".
The installation is carried out.
11. Once the installation is complete, click "Close".

Installing IIS on Windows 7

1. Select **Control Panel > Programs and Features**.
2. Click the "Turn Windows features on or off" button on the left.
3. Confirm the "User Account Control" dialog. The "Windows Features" dialog then opens.
4. Select the "Internet Information Services" check box in the "Windows Features" dialog box and click on the corresponding folder hierarchy.
5. Adapt the "World Wide Web Services" settings.
6. Select the following check boxes under "World Wide Web Services":

- For Web servers:

Feature	Option
Common HTTP Features	• Static Content • Default Document • Browse Directory • HTTP Errors
Application Development Features	• ASP.NET • .NET Extensibility • ASP • ISAPI Extensions • ISAPI Filters
Health and Diagnostics	• HTTP Logging • Request Monitoring
Security	• Basic Authentication • Windows Authentication • Request Filtering
Performance Features	• Static Content Compression

- For Web administration tools:

Feature	Option
IIS Management Console	
IIS Management Scripts and Tools	
IIS management service	
IIS 6 Management Compatibility	• Compatibility with IIS metabase and IIS 6 configuration • Compatibility with WMI for IIS 6

7. Click "OK" to start the installation.

4.3.8 How to install service packs for the operating system

Introduction

If you installed the operating system without a service pack, you will need to install the service pack before continuing.

Versions

Note

Refer to the *PCS 7-readme* file to find out which version is required.

Requirement

Only install service packs, if you can reboot the PC station. A service pack may reboot the PC station automatically or you may have to reboot to use the modified function.

Procedure

1. Install the service pack.
2. Recommendation: Perform a reboot of the PC station after installation of the service pack.

Additional information

- Section "Installing security patches, hotfixes, service packs (Page 133)"

4.3.9 How to configure paged memory

Introduction

The operating system requires additional disk space for the paging file (virtual memory; this is created by default on the operating system partition).

Rules for setting the size of the paging file

The size of the paging file depends on the memory configuration of the PC. We recommend the following settings:

- Enter the following for the paging file storage location:
Value: 1.5 to 2 times the working memory (RAM) installed in the PC.
- Enter the same value for the initial size and maximum size of the paging file.

Configuring virtual memory

Refer to the online help of the operating system to learn how to open the dialog for configuring virtual memory.

4.3.10 How to make additional system settings

Procedure

1. Set up local users and groups via the Control Panel. You can find additional information on this in the section "Setting up user groups and users (Page 91)".
2. We recommend the following display settings:
 - Select one of the following settings for PCS 7:
 - Use of standard monitors: Minimum resolution 1280 x 1024
 - Use of widescreen monitors: Minimum resolution 1680 x 1050
 - The higher resolution allows you to better utilize the display features of the PCS 7 software, for example, for the online operation of faceplates from the libraries. Please ensure that you have installed appropriate drivers and are using suitable monitors.
 - Screen savers and power schemes should be disabled on PC stations that are used for process mode.
 - Select the data throughput for network applications for a Windows server 2003. The option "Maximize the data throughput for network applications" is available in the network properties in the tab "File and printer release for Microsoft networks".
 - Select the optimization of the background services for a Windows server 2008. Select the "Extended" tab for optimizing the background services in **Control Panel > System > Extended system settings**.
3. Disable the energy saving option for network adapters.
You can find additional information on this in the section "How to disable the power saving options of network adapters (Page 103)".
4. Use the Event Viewer to check that all services and drivers are functioning correctly.
5. OS server:
Activate the option for optimizing the system performance of background services under "Processor scheduling" in advanced system properties.

4.3.11 How to set color schemes and font sizes

Introduction

The settings for the color scheme and font size can sometimes change automatically when other programs are installed.

Recommendations

The following recommendation increases the performance of the PC station. Correct the following setting, if necessary.

- Color scheme: Windows - Classic

4.3.12 How to install additional components

You need to install additional Microsoft components for some PC configurations.

Note

You can find information on the required software and availability of additional Microsoft components in the PCS 7 Readme file.

Languages

Install the additional Microsoft components in the language of the operating system.

The language versions of this component can be differentiated by a language-specific directory and/or the language detection in the file name.

The following table shows example storage paths for the service pack installation package.

Language	Language code	Microsoft service packs and tools
German	German	German\xxxx-KBxxxxxx_xxx-xxx-DEU.exe
English	English	english\xxxx-KBxxxxxx_xxx-xxx-ENU.exe
French	French	french\xxxx-KBxxxxxx_xxx-xxx-FRA.exe
Italian	Italian	italian\xxxx-KBxxxxxx_xxx-xxx-ITA.exe
Spanish	Spanish	spanish\xxxx-KBxxxxxx_xxx-xxx-ESN.exe

Procedure

1. Install the components named in the *PCS 7 Readme* file.

4.3.13 Installing additional services for SIMATIC BATCH

Introduction

If you want to transfer SIMATIC BATCH archives using FTP, then additional installations are required on the PC stations.

In addition to the services being installed

PC station	Service or software that needs to be installed
PC station to which the BATCH archives are transferred	IIS service FTP service
PC station from which the transfer of BATCH archives will be activated	FTP service
PC station from which the transferred BATCH archives will be accessed	BATCH Control Center (BatchCC)

Additional information

- You will find additional information on configuring services in the manual *Process Control System PCS 7; SIMATIC BATCH*.

4.3.14 Creating a backup

Recommendation

After restarting and testing the installation, create a backup of the partitions on which the operating system/PCS 7 software is installed.

We recommend creating an image of the installation for backing up partitions and hard drive data. An image allows you to restore partition and hard drive data at any time or to prepare the PC for a software reinstallation.

Note

Please be aware that the license keys cannot and may not be included in the backup.

- Move the license keys to another medium (license key USB stick, partition etc.) before creating the image.
- In selecting image software, ensure that it is suitable for the operating system in use.
- To create an image, follow the image software manufacturer's instructions.

4.4 Installing the PCS 7 software

4.4.1 Notes on installing PCS 7

Introduction

The PCS 7 software contains applications that allow you to configure systems and operate and monitor them in runtime. In addition to the applications of the basic software, there are numerous optional packages and upgrade packages that you can install later and use for special applications.

Refer to the latest *ST PCS 7* catalog to learn about all of the software packages released for PCS 7 and how they can be used. You can also find a detailed introduction in the documentation *Process Control System PCS 7; Engineering System*.

The following describes the installation for the basic PCS 7 software.

Versions of the software package

You can find information about versions of software packages which you can install from the latest *Process Control System; SIMATIC PCS 7* DVD in the *Process Control System PCS 7; PCS 7 Readme* file on the DVD.

Latest information about the installation

Note

Please note the following:

- When installing PCS 7 in a network, make sure that at least one DVD drive and one diskette drive are available.
 - Read the latest information about installation and the software and hardware requirements in the *Process Control System PCS 7; PCS 7 Readme* file on the DVD *Process Control System; SIMATIC PCS 7*.
 - If you install PCS 7 in a domain, be aware of the group policies or other restrictions that may hinder the installation. Consult the appropriate Administrator as regards these settings and the required approvals and authorizations.
 - If you want to use the Windows firewall, you must wait until PCS 7 is installed before activating it.
-

Rules for the installation and use of PCS 7 and other software

Note

Only the software products listed in this manual should be installed on a PCS 7 PC. This applies in particular to PC stations used for process mode (OS, BATCH, Route Control).

Installing and simultaneously activating applications that are not approved by Siemens can adversely impact the PCS 7 system performance.

The user bears sole responsibility when third-party products are used.

If you nevertheless need to use third-party products, they should be installed before you install PCS 7. PCS 7 and these third-party products should not run at the same time.

Several PCS 7 applications on a single PC station

A PC station can not only be used to run a single PCS 7 application (such as OS server) with PCS 7, it can also be used to run several PCS 7 applications (such as OS server and BATCH client). You can find additional information on this in the appendix "Approved configurations (Page 154)".

Installing the Microsoft SQL Server for PCS 7

The Microsoft SQL Server is required in PCS 7 for the specific PC stations: for example, operator station, engineering station.

As of PCS 7 V7.1, the installation is performed within the PCS 7 system setup and is automatically selected when required by the configuration to be installed for the PC station.

You can find additional information on this in the "Setting up user groups and users (Page 91)" section.

Using Microsoft Office

You can find additional information on this in the *Process Control System PCS 7; PCS 7 Readme documentation*.

Security settings

Settings are required in the registry, in DCOM and in the Windows firewall exception list for trouble-free operation of the PCS 7 software.

Before PCS 7 setup program performs the installation, the "Security Controller" dialog box appears. This dialog box displays the system settings that Setup for PCS 7 will make on the PC station.

- The settings in the exception list of the Windows firewall are applied to the area of the local network (subnet). If your PC stations are located in different networks (subnets), you need to change this area.
- The settings in the exception list of the Windows firewall are made when the Windows firewall is disabled.
- You can call up the "Security Controller" dialog box again. Select the menu command **Security Controller** in the Windows Start menu under the Siemens SIMATIC programs.

Note

The settings must be applied again if a change is made in the work environment, for example, if you change from a domain to a workgroup or vice versa.

Note

For PCS 7 product bundle PCs such as SIMATIC PCS 7 BOX and SIMATIC IPC, note the following:

- When in factory state, the settings are made in the registry, in DCOM and in the exception list for the Windows firewall.
 - The local Windows firewall for the PCS 7 product bundle PC is disabled in the factory state.
 - The log of firewall events is disabled.
-

Note

When the PCS 7 plant is operated in a domain, the security settings must match throughout the entire domain. Consult with your administrator to agree upon uniform security settings.

Shutting down Windows, standby mode / hibernation

Whenever you shut down Windows on your PCS 7 computers, use the command "Shutdown" or "Restart". Do **not** use the following operating modes:

- Standby mode
- Hibernation

4.4.2 How to install in a network

Preparation

If you want to install several PCs, make the following preparation:

Copy the contents of the SIMATIC PCS 7 DVD to a hard disk that can be accessed by every PC. In this way, you can install several PCs at one time.

Rules

Observe the following rules when installing PCS 7 over a network

- Make sure the PC is set up to automatically restore the link to the directory containing the PCS 7 software after a PC restart.
- Set up a share for the directory (folder or drive) on which the PCS 7 software is available.
- Set up the following access rights for the share:
 - Operating user: Read
 - System: Read

Procedure

1. Copy the files of the DVD to a folder.
Then continue working on the PC on which you want to install PCS 7.
2. In Windows Explorer look for the folder in the network on which you saved the copy of the DVD.
3. Call up the setup.
You can find additional information on this in the section "How to install the PCS 7 software (Page 84)".

4.4.3 How to install the PCS 7 software

Introduction

The *Process Control System; SIMATIC PCS 7* DVD contains the complete software for the PCS 7 applications. Only certain applications must be installed depending on the PCS 7 application itself. In this phase you are supported by the PCS 7 system setup.

Licensing

You can transfer the license keys required for the software package either before or after the PCS 7 installation.

You can find a description of the license concept in the section "Licensing the PCS 7 software (Page 110)".

Checking the installation requirements

The PCS 7 system setup automatically checks whether the software components needed for the PCS 7 installation are already installed on the PC.

Missing software components are indicated with a message. The setup program is terminated after the message is confirmed. You must install the missing software components. Then, restart the PCS 7 system setup.

Plant with Process Historian as long-term archive server

Select the following program package for the OS servers that are to export archives to a Process Historian: **OS-Server for Process Historian**.

The "Process Historian Ready Component" can be installed at a later point in time on an OS server, if it has not yet been installed on the OS server. You can find it using "User-defined Installation" in the "Archiving and Reporting" folder.

Installing an OS server for PCS 7 Maintenance Station Basic

You can install the basic diagnostics for asset management for **one** OS server in a PCS 7 system without a Maintenance Station.

- No additional license key is required in order to use these functions.
- Additionally, select the "Maintenance Station" program package for this OS server.

You can find more information on this topic in the documentation *Process Control System PCS 7; Maintenance Station*.

Requirements

- The operating system is installed and all the steps described in the "Installation of the Operating System" section have been completed.
- All communications processors have been installed in the PC.
- You have administrator rights on the PC station.

Starting the PCS 7 setup

1. Insert the *Process Control System; SIMATIC PCS 7* DVD into the DVD drive.
2. Double-click on "Setup.exe" to start the setup.
Setup starts.

Settings in the setup

Below, you will find information about the settings made in the setup dialog boxes, listed in the order in which they are processed:

1. Setup language
 - For example, "English" and "Next"
2. Welcome
 - ... "Next"
3. Product information
 - ... Read this if needed and click "Next"

4. License agreement
 - ... Select the check box "I accept the conditions of the above license agreement as well as the conditions of the Open Source license agreement. I confirm that I have read and understood the security information".
 - ... "Next"
5. Setup type
 - ... Activate the "Install" or "Update" check box and click "Next".
6. User information
 - Enter the user information and "Next".
7. Installation type
 - ... Activate the "Package installation" check box to install the preselected software package.
 - ... Click "Browse" if you want to set a different destination folder.
 - ... "Next"
8. Program package
 - The program packages are shown. You can add additional PCS 7 packages. Activate the corresponding check boxes.
You can find approved combinations in the section "Approved configurations (Page 154)".
 - ... "Next"
9. Programs
 - Select the required packages.
 - ... "Next"
10. Selection of the programs to be installed
 - ... the selected programs are displayed. You can add additional software.
 - ... "Next"
11. If the installation of the Microsoft SQL server is required for the selected software component:
The displayed license agreement is valid for the installation of the SQL server. Enter the required and desired settings and operations:
 - ... "I accept the conditions of the license agreement" check box.
 - ... "Next"
12. System settings
Specific system settings and security settings are required for PCS 7. These settings apply, for example, to the registry, DCOM, OPC applications and the Windows Firewall exception list. An installation of PCS 7 is not possible without the required settings.
Select the "I accept the change to the system settings" check box.

13. Ready to install the selection.

- The software installed on the PC for this PCS 7 application is listed in the display window.
- ... "Install"

14. Close the dialog box when the installation is complete.

15. Reboot the PC.

Setting the network connection to the terminal bus

If several network adapters are installed in the PC, network connections to the terminal bus must be set in order for the PC to be operated in the PCS 7 plant.

After a PCS 7 installation, a dialog appears in which the network adapter for the terminal bus must be selected. Once an adapter is selected, confirm it with "OK" and then confirm the "Reinitialize" dialog with "Yes".

- If several standard network adapters are used, the adapter for the terminal bus must appear first. (Network Properties: "Advanced > Advanced Settings").
- Network adapters with no functionality must be disabled.

You can find additional information on this topic in section "How to set the communication module for connecting to the terminal bus (Page 128)".

Display of installed software

You can check which software packages are installed on the PC station.

To do this, select the Start menu of Siemens SIMATIC programs > **Product Notes > Inst. Software**.

You can find the installed software packages in the "Products" tab.

PC station as a file server for storing projects for multiproject engineering

Note

An engineering station must be installed on a server operating system for a PC station to be used as a file server for multi-project engineering.

PCS 7 licenses are not required for this file server.

You can find more rules about storing projects on network servers in the online help for STEP 7.

4.4.4 How to install the central archive server (StoragePlus)

Introduction

If you install a central archive server (StoragePlus server) with the SIMATIC PCS 7 DVD, perform the following tasks during the installation via Setup.

Note

When installing the central archive server and StoragePlus, set the same language for the logged on user and the default user.

Requirements

- Application servers (IIS and ASP.net) are installed.
- The computer name is assigned for the specific system.

Making settings in the "StoragePlus Installation Settings" dialog box

1. Click the "Install" button in the "Ready to install the selection" setup dialog box. The "StoragePlus Installation Settings" dialog box opens.

Note

You cannot change the settings in the "StoragePlus Installation Settings" dialog box once they have been made.

2. Make the following settings:

Where?	What?
Name of the database:	Enter a unique database name.
Path of the database:	When updating PCS 7: Enter the path for the database file on the local hard disk of the server.
Path of the data log:	Enter the path of the data log.
Shared archive directory:	Enter the path and name of the shared archive directory. The shared archive is used as a common location for swapping out the archive segments and reports of the OS server to the central archive server (backup path).

You can find additional information on this in the section "How to install the PCS 7 software (Page 84)".

Note on installation

Please note the following:

- The names of the database files are derived from the individual database names as follows:
 - Configuration database - name of database file: "DBName.mdf"
 - Configuration database - name of database log file: "DBName.ldf"
 - Runtime database - name of database file: "DBName_D.mdf"
 - Runtime database - name of database log file: "DBName_D.ldf"
- If you wish to use an existing database, note that you also have to use the name of the database and corresponding path where it is located.

The following recommendations for distributing the archives on the partitions provide optimized performance and operating security:

- Do not set the paths for the interim archive or the shared archive directory to the partition containing the Windows operating system.
- Do not store any other data (swap file of the operating system, for example) on the following partitions:
 - The partition of the shared archive directory
 - The partition of the interim archive, if you have selected the "Fraction of hard disk capacity" option for automatic archiving
With this option, the time period which the total archive can encompass depends on the remaining free space in the partition. This determines how far back you can access the tag logging data.
- Ensure that there is enough free space on the partition for the shared archive directory so that the OS server can continue to swap out archive segments even after process mode has ended on the central archive server.

We recommend the following to increase the performance of the central archive server when large amounts of data are involved:

- Use a central archive server with several hard disks.
- Do not set the path of the database to the hard disk where the operating system of the PC station is installed (additional hardware required).

Increased performance and data security

Please note the following:

- We recommend the use of RAID systems (RAID 0) to increase performance.
- We recommend the use of RAID systems (RAID 1) to increase data security for the central archive server.
- If the central archive server is used with large volumes of data, we recommend that you use the Premium Server listed in the *ST PCS 7.1* catalog (SIMATIC PCS 7 add-ons).

4.4.5 How to install the Process Historian

Installing the Process Historian

You can find information on how to install the Process Historian in the *SIMATIC Process Historian* documentation.

4.4.6 Configuring redundancy for redundant servers

Introduction

You will need to configure the redundancy monitoring for redundant servers in PCS 7.

The following connections are available for redundancy communication:

- For OS servers and SIMATIC Route Control:
Null-modem cable to COM interface or network cable (cross-over cable) to an additional Ethernet network adapter.
- With BATCH servers:
Network cable (cross-over cable) to an additional Ethernet network adapter.
If using a PC as a BATCH server, this is the only type of redundancy connection permitted!

You can find additional information about configuring redundancy in the section "How to activate redundancy for fault-tolerant PCs (Page 136)".

Additional information

- You will find information on configuring fault-tolerant components, redundancy and redundancy monitoring for redundant servers in the manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*.

4.4.7 Installing a PC for Web Option for OS

Installation of PCS 7 Web server and PCS 7 Web client

You can find all the information and step-by-step instructions for installing the following PC stations in the *Process Control System PCS 7; Web Option for OS* manual:

- PCS 7 Web server
- PCS 7 Web client
- PCS 7 Web diagnostics server
- PCS 7 Web diagnostics client

Additional information

- Documentation *Process Control System; SIMATIC PCS 7; PCS 7 Readme*

4.4.8 Setting up user groups and users

Some user groups and users are created automatically when PCS 7 software is installed.

The following table shows:

- The software installation on the PC station with which the user groups and users were created.
- The user group in which a user must be a member in order to use an installed application.

Note to the reader for the "User Groups and users" table

- The "Installation / Group in Setup" column defines the software that must be installed on the PC station in order for the user groups and users to be created.
- The "Component" column defines the standard component in the PCS 7 system setup which creates the user groups and users.
- The "User group / users" column lists the user groups and users which are automatically created when a software package is installed. The **user groups** are marked "bold".
- The "Members" column lists the users that are assigned to a user group in a PCS 7 plant.

User groups and users

Installation / Group in Setup	Component in the PCS 7 system setup	User group / users	Members
Operating system	-	User	Note: In Windows XP / 2003, assign the PCS 7 users to the Power Users group or a group with a higher permission level.
Engineering	PCS 7 Engineering	SIMATIC HMI	OS project engineer Project administrators Operator Operator groups
	BATCH Engineering	SIMATIC BATCH	BATCH project engineer
	Route Control Engineering	RC_ENGINEER RS_MAINTENANCE RC_OPERATOR_L1 RC_OPERATOR_L2 RC_OPERATOR_L2	Route Control project engineer Route Control administrator (with all rights) Operators You can find additional information about operator authorization in the <i>Process Control System PCS 7; SIMATIC Route Control Manual</i> .

4.4 Installing the PCS 7 software

Installation / Group in Setup	Component in the PCS 7 system setup	User group / users	Members
Runtime / Server	OS server	SIMATIC HMI	Project administrators Operator Operator groups
	BATCH server	SIMATIC BATCH	Operator
	Route Control server	RS_MAINTENANCE RC_OPERATOR_L1 RC_OPERATOR_L2 RC_OPERATOR_L2	Operator
Runtime / Single station	OS single station	SIMATIC HMI	Project administrators Operator Operator groups
	BATCH single station	SIMATIC BATCH	Operator
	Route Control single station	RS_MAINTENANCE RC_OPERATOR_L1 RC_OPERATOR_L2 RC_OPERATOR_L2	Operator
Runtime / Client	OS clients	SIMATIC HMI	Project administrators Operator Operator groups
	BATCH clients	SIMATIC BATCH	Operator
	Route Control clients	RS_MAINTENANCE RC_OPERATOR_L1 RC_OPERATOR_L2 RC_OPERATOR_L2	Operator
SIMATIC Logon		LOGON_Administrator	Project administrators
SIMATIC NET	SIMATIC NET	SIMATIC NET	When the "SIMATIC NET" user group is created, all Windows users that work with PCS 7, PCS 7 OS or Route Control projects must be a member of this group.
Post-installation	STEP 7	Siemens TIA Engineer	Post-installation of STEP 7 products, e.g. service packs

User management options

Distinguish between the following:

- User management in Windows, without SIMATIC Logon:
 - User management on a single PC
 - User management performed from a central location in Windows (PCs in a domain)
- User management expanded to include SIMATIC Logon:

Many PCS 7 applications support central user management with the "SIMATIC Logon" software. SIMATIC Logon is based on the main mechanisms of Windows user management.

SIMATIC Logon provides the following enhancements for user management:

 - User management has been enhanced to include SIMATIC Logon from a central location in Windows (PCs in a domain).
 - User management is expanded to include SIMATIC Logon on a single PC

Setup of Windows users for PCS 7

The user who installs the PCS 7 components is automatically entered as a user of these components in Windows management.

If you want to authorize other users to use a PCS 7 component, they must be set up in Windows and assigned to the relevant PCS 7 components (user groups).

You can find additional information on this in the "How to set permissions for the project paths (Page 95)" section.

Basic procedure

- Run the following functions centrally in Windows for all options for setting up users and user groups:
 - Definition of users and user groups that are available on the Windows Server in question
 - Definition of passwords
- The following applies to defining user roles with the SIMATIC Logon:

You can assign users and user groups particular roles within some PCS 7 applications (for example, SIMATIC BATCH).

Example: SIMATIC BATCH

 - User permissions in a user role (global)
 - Permitted user roles per computer (for each specific computer)
 - Permitted user roles per unit (for each specific unit)
- The PCS 7 applications are supplied with information about the logged on user via the central logon service and can be informed of any change of the logon, etc.

Basic procedure in a Windows domain

When operating in a domain, an additional global user group can be set up for the domain and made a member of the "SIMATIC HMI" user group.

- A domain administrator is responsible for creating users and groups in a domain. This administrator must have the necessary experience and authorization to administer the network.
- Domain administrators have special permissions in PCS 7 systems for managing the network, for example, for user management or for entering computer stations in a domain. We recommend you refrain from using these permissions when working in the PCS 7 project.

Requirements

- The domain administrator has created a global user group for the domain.
- The domain administrator has entered users within the domain into the global user group for the domain. These users can access WinCC when logged on.

Procedure

1. Open the administration of the workplace under Windows.
2. In the navigation window, select "Local Users and Groups > Groups". All groups are displayed in the data window. Select the "SIMATIC HMI" group.
3. Open the "Add member" dialog using the shortcut menu and enter the global user group for the domain as a member of the "SIMATIC HMI" user group.

Setting authorizations under Windows Server 2008 operating systems

Users of the "Power user" user group have to be authorized to "Shutdown the system".

1. Go to the Start menu in Windows and select the "Run" dialog box.
2. Enter the following in the input field:
gpedit.msc
The "Group Policy Object Editor" dialog window opens.
3. In the tree view, select **Local Computer Policy > Computer Configuration > Windows Settings > Security Settings > Local Policies > User Rights Assignment**.
4. Double-click the "Shutdown the system" object in the detailed window.
The "Properties of shutdown the system" dialog box opens.
5. Click the "Add Users or Group" button.
The "Select Users or Groups" dialog box opens.
6. Enter the power users in this group.

Additional information

- Manual *SIMATIC; SIMATIC STEP 7*
- Online help *WinCC Information System*
- Manual *Process Control System PCS 7; SIMATIC BATCH*

- Manual *Process Control System PCS 7; SIMATIC Route Control*
- Manual *SIMATIC; SIMATIC Logon*

4.4.9 How to set permissions for the project paths

As of PCS 7 V7.1 SP3, the PCS 7 OS works with a modified internal authentication mechanism. You can make the setting for the project paths with the "SIMATIC Rights" program. The required adjustments are performed automatically during the installation of PCS 7 or when you first open an OS project.

Use the "SIMATIC Rights" program to set the approval and NTFS authorizations for the OS users.

Requirement

- PCS 7 is installed.
- The following steps are performed with administrator rights
- All users must be assigned to the "SIMATIC HMI" user group. This also applies to users who want to open the OS projects remotely.
 - Windows administrators have unrestricted permissions to access the OS database.
 - Members of the "SIMATIC HMI" user group have "Read/Write" permissions for access to the OS database.
Members that have also been added to the "SIMATIC HMI VIEWER" user group only have the "Read" permission for access to the OS database.

Procedure

Perform the following steps for all paths in which projects are located (STEP 7, PCS 7 or WinCC projects):

1. Start the SimaticRights program.
You can find information on the availability of the file in the *PCS 7 Readme*.
2. Select the path where the PCS 7 projects are or will be stored under "Storage location" .
Confirm with "OK".

Restrictions to standard Windows user rights

The following permissions are restricted for users who only have standard Windows user rights after the installation of PCS 7:

- **Access to the system information of the "System info" WinCC channel**
Windows users with standard user rights must be included in the "System monitor users" Windows group if they need the following information:
System information of the "System info" WinCC channel:
 - CPU utilization
 - Status of swap file
- **Restrictions on the use of ODK functions**
The following ODK functions are no longer available for users with standard Windows user rights:
 - CreateDatabase
 - DatabaseAttach
 - DatabaseDetach

Additional information

- Manual *SIMATIC; SIMATIC STEP 7*
- Online help *WinCC Information System*
- Manual *Process Control System PCS 7; SIMATIC BATCH*
- Manual *Process Control System PCS 7; SIMATIC Route Control*
- Manual *SIMATIC; SIMATIC Logon*

4.4.10 Firewall in PC stations

Windows firewall

PCS 7 uses the operating system's firewall (see *pcs7 readme*). The required settings are made during the PCS 7 setup.

Requirement for using a firewall on the plant bus

The CP 443-1 must have particular firmware versions installed if you intend to use a firewall on the plant bus. You will find additional information on this topic in section "Preconfigured PC systems for PCS 7 (product bundles) (Page 49)".

Additional information

- Section "Components for connection to the terminal bus/plant bus (Page 51)"

4.4.11 Subsequent installation or updating

If a PCS 7 software package is already installed on the PC, a dialog box for the type of installation appears during the PCS 7 system setup. You can specify which type of installation you require in this dialog box:

- Installation
- Update

Installation

Subsequent installation allows you to use additional PCS 7 functions. You will find additional information on this topic in section "Appendix B - Approved configurations on a PC station (Page 154)".

Update

An update replaces existing software packages with newer versions of the software. Make sure that you select the latest software packages of the new version.

Recommendation:

Reboot the PC station before updating the PCS 7 software.

Note

Some of the PCS 7 software packages automatically restart the PC station when updating.

Note

If you want to update a PCS 7 project of a previous PCS 7 version with a current PCS 7 version, then follow the descriptions provided in the software update manuals.

You can find additional information in the manual *Process Control System PCS 7; Software Update*.

Using the SIMATIC Management Console

The SIMATIC Management Console is a software from the SIMATIC PCS 7 product family for central administration of SIMATIC software products.

- You can use the SIMATIC Management Console (hereafter "Management Console") to make software administration easier and define plant-specific rules and reproducible processes. Here are some of the important functions of the Management Console:
 - Installing software remotely
 - Determining inventory data
 - Determining license information
- Software administration with a central Management Console is more efficient than with a local PCS 7 installation.
- The SIMATIC Management Console provides functions for acquisition of inventory data of your PCS 7 plant.

Additional information

- Section "Notes on installing PCS 7 (Page 81)"
- The Management Console software packages are available on the *Process Control System; SIMATIC PCS 7* DVD.

4.4.12 Expanding a central archive server from the "non-redundant" to the "redundant" type

Starting situation

There is a non-redundant central archive server (CAS) in a PCS 7 plant.

Expansion

The non-redundant central archive server is to be converted to a redundant type. The system is supplemented by an additional PC station, which is operated as a redundant partner.

Naming convention

The non-redundant central archive server is referred to as "CAS1" hereafter; the additional PC station is referred to as "CAS2" hereafter.

More information on the requirements and configuration of a central redundant archive server is available in the *Process Control System PCS 7; Fault-Tolerant Process Control Systems* manual.

Requirements

- The software update of the PCS 7 plant is complete.
- All archive segments previously connected to the central archive server "CAS1" are separated **manually**.

- The requirements for redundancy under PCS 7 must be met by the PCs of "CAS1" and "CAS2," for example suitable hardware, same configuration of the hard disks.
- The operating system is installed on the PC of "CAS2" in accordance with the software requirements for central archive servers. All the required operating system settings have been made and the necessary components are available.
- There is a redundancy cable between the PCs of "CAS1" and "CAS2" and the redundancy interface is configured.
You can find additional information on this in the section "How to activate redundancy for fault-tolerant PCs (Page 136)".
- The PCs of "CAS1" and "CAS2" are available via the terminal bus.

Procedure

1. Define the path of the project directory on "CAS1."
Select the object of the station in the ES project under the PC station of "CAS1" and "WinCC CAS Appl.". Select "Object properties> Target OS > Path to target OS computer" in the shortcut menu.
2. Define the name of the StoragePlus database and the configured path "Common Archive Name" on "CAS1."
The name and path is available in the StoragePlus Administration Console under "System Configuration > Common." The default name is "_ARCHIVE_01_.*." The path is in the field of the same name "Common Archive Name."
3. Define the path of the StoragePlus database in the installation directory on "CAS1."
You define the path in Windows Explorer by searching for the database names established under step 2, for example "...\\StoragePlus\\Database."
4. Add a new PC station for the "CAS2" in the ES project.
In HW Config, configure the "WinCC CAS Appl. (stby)" application and the connection to the terminal bus.
5. In the ES project, change the configuration of the central archive server "CAS1" from "non-redundant" to the "redundant" type.
Select the "Target OS" tab in the object properties of "CAS1" and select the name of "CAS2" in the field "Standby OS."
6. Configure the target path for the PC station "CAS2."
Select the tab "Target OS" and "Master OS" in the properties of "CAS2" and configure the path in the field "Path to target OS and master OS."
7. Generate the server data for "CAS1."
In the ES project, select the menu command "Generate server data" in the shortcut menu of "CAS1."
8. Exit process mode on the PC of "CAS1." Restart the "CAS1" PC station.
9. Exit the "SQL Server (WinCC)" service via the service console on "CAS1."
Note: Administrator rights are required.
10. In Windows Explorer, copy the StoragePlus databases including path from "CAS1" to "CAS2." You have specified the path, for example "...\\StoragePlus\\Database," and the database name in steps 2 and 3.
Restart the "CAS1" PC station.

11. Run a complete load for "CAS1" and start process mode.
12. Install the central archive server on the "CAS2" PC station.
Start Setup on the SIMATIC PCS 7 DVD and select the "Central Archive Server" option in the "Program Packages" dialog box under the "Runtime > Server" directory.
13. Adjust the path and name of the StoragePlus databases to match the paths and database names used in step 10. Complete the "CAS2" installation.
14. Update the server data for all OS clients to be shown in the process mode archive values.
Open the WinCC project of the OS client on the ES. Select the "Server Data" object in the tree view.
Select the shortcut menu command "Update...".
15. Select the shortcut menu command "Configure..." and configure the preferred server for this OS client in the following dialog box.
Repeat these steps for all OS clients.
16. Load the target system for all OS clients in the ES project whose server data was updated in the previous steps.
17. Load the target system for all operator stations which previously swapped out archives to the central archive server "CAS1."
18. Run a complete load for "CAS2" and start process mode.

See also

Configuring redundancy for redundant servers (Page 90)

4.4.13 Removing PCS 7

If you no longer require PCS 7 on the PC station, you can remove the PCS 7 software by performing the steps described below.

Recommendation

- Remove the license keys.
- Backup the data which is still required, for example, the default folder with the PCS 7 projects.

Procedure

1. Insert the DVD and start Setup.
 2. Select the "Remove" Setup option.
 3. Select the components that are no longer are required on the PC station.
- Follow the instructions to remove the PCS 7 software.

4.5 Installing drivers for PCS 7

4.5.1 Drivers for communications processors

4.5.1.1 Drivers for communications processors

Introduction

The PCS 7 setup automatically installs the required drivers for the communications modules on computers approved for PCS 7. This is only possible when the communications modules have been inserted in the PC prior to installation of PCS 7.

If the type of communications module changes after a PCS 7 installation, you will have to reinstall the driver for the communications module ("SIMATIC NET PC Software" package).

Plug-and-play capability

The communications processors used for PCS 7 support plug-and-play. The required settings are made automatically when the PC starts up.

Note

If plug-and-play components are not detected, check in the BIOS whether the detection of plug-and-play components is activated. You can find additional information on this in the documentation of the BIOS manufacturer.

Detection of plug-and-play components is activated as default for SIMATIC PCS 7 BOX.

Switching the logs on the bus (Industrial Ethernet)

If you need to change the protocol of a bus in a system, from TCP to ISO protocol for example, you will need to set a mixed protocol (TCP and ISO) briefly on the engineering station.

Now load the configuration data onto the AS and the operating and monitoring systems.

Note

Do not disable the TCP/IP or ISO protocol during operation since they are both needed for configured operation!

Data transmission rate and bus access procedure

Make sure there are no inconsistencies in Ethernet CPs, switches and network adapters in terms of their settings/properties for data transmission rate and bus access procedure.

We recommend using the default setting **Autonegotiation** (procedure for automatic negotiation for the best transmission mode for two directly interconnected network interfaces).

You can find additional information on this in the section "How to change the transmission rate and the mode in the PC network (Page 132)".

Settings for the plant bus

Make the following settings for the plant bus:

- Disable "File and printer sharing"
- Disable "Client for Microsoft network"
- Enable the ISO protocol
- Disabling energy saving options

Read the relevant information on this in the following documentation:

- Configuration manual *Process Control System PCS 7; Engineering System*
- Configuration manual *Process Control System PCS 7; Operator Station*
- WinCC Information System: "Special features of communication using a server with several network adapters"

4.5.1.2 How to configure standard communication modules

Settings for BCE and SOFTNET CPs

We recommend the following if there is a separate bus (terminal bus and plant bus) in the plant:

- Setting of PC stations for communication via the plant bus:
 - Enable the ISO protocol.
 - Disable the TCP/IP protocol.
- Exception for the setting on PC stations for communication via the plant bus.
Select the protocol you use on the plant bus for the configuration of the communication modules (CPs preferred) in HW Config and/or NetPro.
This applies to the following PC stations:
 - SIMATIC PCS 7 BOX
 - SIMATIC PCS 7 AS RTX
 - Automation systems in which the CPU has an integrated Ethernet interface.

Requirements

- PCS 7 has been installed.
- There is no communication.
- The user programs are closed.
- The network adapter is not a CP 1613 or CP 1623.
The CP 1613 or CP 1623 uses another type of connection (S7 connection).

Procedure

1. Select the protocol for communication via the respective network adapter in the properties dialog of the network connections. Recommended protocol:
 - Terminal bus: TCP/IP
 - Plant bus: SIMATIC Industrial Ethernet (ISO)
2. For PCs with several network adapters:
 - Select the advanced settings.
 - Move the network connection to the terminal bus in the "Connections" area to the top position.
3. Reboot your PC to activate the settings.
4. Clear the following options for the communications processor on the plant bus:
 - Client for Microsoft Network
 - File and Printer Sharing for Microsoft Networks

Note

Also refer to the notes in the *WinCC Information System*, under the topic "Special Communication Features for a Server with Several Network Adapters".

4.5.1.3 How to disable the power saving options of network adapters

Many modern network modules and network adapters support energy management features. You can reduce energy consumption with these features.

Energy saving options allow the PC to monitor the activity of input devices. If energy saving options are activated, they shut the PCS 7 PC down or trigger a restart if the PC is inactive for a set period of time.

We recommend that you disable all power-saving options for all PCs involved in the process mode.

4.5.1.4 How to prepare a PC Station with CP 1613 / 1623 for operation in PCS 7

Introduction

If a CP 1623 / CP 1613 communications module is used in a PC station, the NDIS adapter needs to be configured in the following situations:

- You want to monitor the diagnostics of network components on the plant bus with a maintenance station (MS).
A CP 1623 / CP 1613 communications module is used on the PC of the maintenance station for access to the plant bus.
- An automation system in a SIMATIC PCS 7 BOX is to be loaded using an external engineering station.
A CP 1623 / CP 1613 communications module is used on the engineering station for access to the plant bus.

NDIS standard

The "Network Driver Interface Specification (NDIS)" standard enable operation of multiple communication modules or simple network adapters in a PC. It also allows the use of several protocols on a communication module or network adapter.

Configuring an NDIS Adapter

Note

Make these network settings on the PC station for each CP 1623 / CP 1613 communications module of the PC station.

As of PCS 7 V7.1, the communications module is installed automatically with the NDIS adapter and only needs to be configured.

1. Open the dialog for setting the network connections.
2. Select the menu command **View > Details**.
3. With the right mouse button, select the communication module with one of the following names in the column "Device name:"
 - When using a CP 1613:
Device name "SIMATIC Miniport CP1613 PCI Adapter"
 - When using a CP 1623:
Device name "SIMATIC Miniport CP1623 PCIe Adapter"Select the shortcut menu command **Properties**. The "<Network Connection> Properties" dialog opens.
Recommendation:
First, select the shortcut menu command **Rename**. Enter a descriptive name, for example, "CP_NDIS_Nr_1".
4. Select the connection "Internet Protocol (TCP/IP)" in the "General" registry. Click "Properties".
The "Internet Protocol (TCP/IP) Properties" dialog box opens.
5. Activate the "Use the following IP address" check box.
Configure the following fields for the specific plant:
 - IP address
 - Subnet mask
6. Click "OK".
7. Close the dialog box "<Network Connection> Properties" by clicking "OK."

Result

The network settings for the NDIS adapter are now applied.

4.5.2 Additional Devices and Drivers for PCS 7

4.5.2.1 Overview of additional devices and drivers for PCS 7

If you want to make use of specific properties of PCS 7, special drivers are required.

Note

You can find information on the required software and availability of drivers in the *PCS 7 Readme* file.

Overview of additional devices and drivers

Multiple monitors on a single PC

Driver	Additional information
Matrox Multi VGA	Section "How to activate a multi-VGA graphics card (Page 106)"

PC station on redundant network

Driver	Additional information
Network adapters (team mode for redundant connection to the terminal bus)	Documentation <i>Process Control System PCS 7; Fault-tolerant Process Control Systems</i>

Time signal via DCF77

Driver	Additional information
Time reception service	Section "How to activate the DCF77 reception service (Page 108)"

Acoustic or visual signal transmitter

Driver	Additional information
Horn module	The required drivers are automatically installed with PCS 7. Documentation <i>Process Control System PCS 7; Operator Station</i>

Acoustic signal transmitter

Driver	Additional information
Sound card	Installation medium for the sound card or Windows standard; Section "Assigning the driver to the sound card (Page 108)"

Chip cards

Driver	Additional information
Chip card reader	<i>WinCC Information System</i> required drivers: Log on via SIMATIC Logon: • Driver for "OMNIKEY CardMan 3121 USB" : CardMan3x21x86_1_1_2_4.exe" • (Only Windows XP/2003) driver for "OMNIKEY CardMan 3111": CardMan3111_V1_1_2_1.exe" Log on without SIMATIC Logon via chip card reader (Using WinCC User Administrator on operator control and monitoring stations only with Windows XP/2003) • Drivers for "OMNIKEY CardMan 3111" Install both drivers: – CardMan3111_V1_1_2_1.exe – CT-API_V4_0_2_2.exe • Drivers for "OMNIKEY CardMan 3121 USB" Install both drivers: – CardMan3x21x86_1_1_2_4.exe – CT-API_V4_0_2_2.exe

Additional information

Section "Optional hardware components (Page 53)"

4.5.2.2 How to activate a multi-VGA graphics card

The following information includes notes on the use of Multi-VGA graphics cards on computers released as bundle PC in PCS 7.

Released operating systems

The Multi-VGA graphics cards have been released for the following operating systems:

- Windows XP Professional
- Windows 7 Ultimate
- Windows Server 2008 and Windows Server 2008 R2

Note

Installation of the drivers

Make sure that you do not use the hardware wizard to install the drivers. Start the setup by means of the Windows Explorer.

Note**Product notes for the bundle PC**

Observe the product notes for the bundle PC. They include additional information on the drivers for different components and operating systems.

Recommended Multi-VGA graphics cards

The drivers of the following graphics cards are available on the data storage medium of the software package:
"PCS7_Software_Support_and_Tools" On the PCS 7 version to be installed in the "01_Drivers \DISPLAY" folder.

Graphics card	Operating system	Matrox driver
G450 MMS	• Windows XP (32-bit)	XP2K_596_005.exe
	• Windows 7 (32-bit)	-
	• Windows Server 2008 (32-bit)	-
	• Windows 7 (64-bit)	-
	• Windows Server 2008 R2 (64-bit)	-
M9120 Plus LP PCIe x16	• Windows XP (32-bit)	xddm32_210_00_105_se_u_whql.exe
	• Windows 7 (32-bit)	wddm32_401_00_105_whql.exe
	• Windows Server 2008 (32-bit)	wddm32_401_00_105_whql.exe
	• Windows 7 (64-bit)	wddm64_401_00_105_whql.exe
	• Windows Server 2008 R2 (64-bit)	wddm64_401_00_105_whql.exe
M9140 LP PCIe x16	• Windows XP (32-bit)	xddm32_210_00_105_se_u_whql.exe
	• Windows 7 (32-bit)	wddm32_401_00_105_whql.exe
	• Windows Server 2008 (32-bit)	wddm32_401_00_105_whql.exe
	• Windows 7 (64-bit)	wddm64_401_00_105_whql.exe
	• Windows Server 2008 R2 (64-bit)	wddm64_401_00_105_whql.exe

Additional information

Multi-VGA graphics cards are intended for use in OS stations.

If you use ES stations, for example, all displays will be shown correctly on monitor 1 only.

Note

You can find additional information on installing and configuring the multi-VGA graphics card released in PCS 7 V8.0 SP1 in the *WinCC Information System* online help.

4.5.2.3 Assigning the driver to the sound card

Introduction

You can use standard sound cards to output acoustic messages.

The driver for the sound card must be assigned in Windows. For more information on availability of the drivers approved for use with PCS 7, refer to the *PCS 7 Process Control System; PCS 7 Readme* documentation.

Requirements

The sound card has been installed.

Procedure

1. If no driver is installed for the sound card, a "?" symbol appears in the right-hand window of the Device Manager.
Install the driver for the sound card via the setup program.
You will find information on the availability of the drivers in the PCS 7 readme.
2. Reboot the PC.

Additional information

You can find additional information about configuring sounds and assigning them to events in the configuration manual *Process Control System PCS 7; Operator Station*.

4.5.2.4 How to activate the DCF77 reception service

DCF77 reception service

The DCF77 reception service performs the following tasks:

- Evaluation of time signals from the DCF77 transmitter of the Physikalisch-Technische Bundesanstalt in Mainflingen in Darmstadt, Germany.
- Comparison of the time signals with the system time of the PC station.
- Correction of the system time, if necessary.

A receiver module reads in the time signals in different ways. The reception service expects the time signals over one of the serial ports of the PC station.

Note

You can use the "DCF77 Reception Service" application as a client application to synchronize any number of PCs without the DCF77 module.

Requirement

- The DCF77 receiver module has been connected to an available serial port on the PC station.

Note

You can find information on the required software and availability of drivers in the *PCS 7 Readme* file.

Procedure

1. Install the driver.
2. If necessary, use the control panel to change the settings.

Additional information

- Documentation *Process Control System PCS 7; Time Synchronization*

4.6 Licensing

4.6.1 Licensing the PCS 7 software

Important terms

The following table lists terminology that is important for licensing:

Term	Description
License	A license provides the right to use products. This right is in the form of: • CoL (Certificate of License) • License key
CoL (Certificate of License)	The CoL certifies the license. The product may only be used by the license owner or authorized persons.
License key	The license key is the "technical representative" of the license (also called an "electronic license stamp").

License properties

Every license is made up of a basic license type and a license type.

The basic license type defines how many PC stations the associated software may be installed and used on. The license type defines any applicable restrictions on how the associated software may be used.

- The following basic license types are available to you:

Basic license type	Description
Single license	With this license, the software may be used on any single computer. The type of permissible usage is defined in the Certificate of License.
Floating license	With this license, the software may be used on any computer within a network. The software may be installed on several computers for this purpose.

- The following license types are available to you:

License types	Description
Unlimited license	With this license, the software may be used without restriction.
Count relevant license	With this license, software usage is restricted to: • The number of process objects, archive tags, process tags ("tags") defined in the contract, depending on the licensed software. Display: The licensed number is displayed in the Automation License Manager under "Scope."

License types	Description
Countable Objects License	With this license, software usage is restricted to: The number of process objects defined in the contract. Display: The values are displayed in the Automation License Manager under "Scope" in the format: "X(Y)" Value "X" = number of licenses still available for process objects. Value "Y" = maximum licensed number of process objects. Calculation: The number of process objects loaded into the AS is calculated by the executing application and is subtracted from the available process objects in the value "X." The value "X" is always updated by the executing application. The value for reducing configured process objects can therefore increase again. The value "Y" always indicates the maximum licensed number of process objects and is therefore not changed.
Upgrade license	Specific system status requirements may have to be met for an upgrade to be performed: - With an upgrade license, a license of an "old" version x can be converted to a version >x+.... - An upgrade may become necessary due to an increased quantity structure, for example.
Rental license	With this license, software usage is restricted to: - The number of operating hours defined in the contract - The number of days after first use defined in the contract Note: The information area of the task bar will display tooltips telling you how long the rental license has left to run.
Pay per use license	With this license, software usage is restricted by the terms of use defined in the contract.
Contract license	With this license, the software may be used without restriction.
Trial license	With this license, software usage is restricted to: - A maximum of 14 days, for example - A certain number of days after first use - Test and validation purposes (disclaimer of liability)
Demo license	With this license, software usage is restricted to: - The number of operating hours defined in the contract - The number of days after first use defined in the contract Note: The information area of the task bar will display tooltips telling you how long the demo license has left to run.

Note

Not all products support all license types. In the *Automation License Manager* you can see which license form is valid for a specific product.

PCS 7 without a license key

You can use the *SIMATIC PCS 7* software package for up to 14 days as a trial version.

Note

You can activate the trial (demo) mode the first time the software is used.

Missing license key

When a software program requests a license key, but it cannot be located on the network in a "valid" format, it is described as a "missing license key".

Automation License Manager

All license keys are managed in a central location using the *Automation License Manager* software, which is installed by means of the PCS 7 system setup.

Virus-free

Note

Check that your PC is virus-free prior to each installation/uninstallation of a license key.

Viruses may pass between the hard disk and storage medium (license key USB stick, license key diskette) when using this method.

Write protection must not be activated when transferring license keys.

Additional information

- Manual *Automation License Manager*

4.6.2 How to transfer license keys

Introduction

The following license keys are transferred with the *Automation License Manager* software:

- License keys belonging to licenses purchased at a later date.
- License keys stored at locations which cannot be accessed by a computer's applications

Possible license key storage locations

- License key USB stick
- License key diskettes

- Local storage media
- Storage media on connected computers
- Removable disks (for example USB stick, but not CDs or DVDs)

Note

Authorizations (licenses for older versions of software packages) cannot be backed up on a license key USB stick or another USB stick.

Options for transferring license keys

The *Automation License Manager* gives you the following options for transferring license keys between the various possible storage locations:

- Drag-and-drop
- Cut and paste
- Offline transfer

Requirement

The *Automation License Manager* has been started up.

Procedure - drag-and-drop

1. Select the appropriate view using the menu command **View > Manage**.
2. On your own or the connected computer, open the storage location to where you wish to copy the license keys.
3. On your own or the connected computer, open the storage location from where you wish to remove the license keys.
4. Select the license keys, hold down the left mouse button and drag the license keys to the folder where you wish to insert them.
The license keys are transferred.

Procedure - Cut and paste

1. Select the appropriate view using the menu command **View > Manage**.
2. On your own or the connected computer, open the storage location from where you wish to cut the license keys.
3. Select the menu command **Edit > Cut**.
4. On your own or the connected computer, open the storage location to where you wish to copy the license keys.
5. Select the menu command **Edit > Paste**.
The license keys are transferred.

Procedure – Offline transfer

The *Automation License Manager* online help describes how to perform an offline license key transfer.

Defective cluster on hard disk

Note

As part of the license key safety system, when license keys are transferred, clusters identified as "defective" are created on the target drive. You must not reconstruct these clusters, as this will destroy the license keys.

Backing up license keys

You can use the *Automation License Manager* to backup **all** license keys.

Read the information under "Possible license key storage locations" provided above.

4.6.3 Selecting the correct license keys

Introduction

The **configurable** size of a PCS 7 plant is scalable. The software product licenses for an engineering station, operator station, SIMATIC BATCH station, Route Control station and SIMATIC PDM are available with different scales. The configuration limit can be expanded with the AS RT PO or OS RT PO licenses.

Levels of licenses

You can find an overview of the licenses and quantity structures in the ST PCS 7 catalog or on the Internet at Technical Support (<http://www.siemens.com/automation/service>):

- Keyword: PCS 7 licenses and quantity structures
- Documentation: *Process Control System PCS 7; Licenses and configuration limits*

Process object

In PCS 7 as of version 7.0, the following applies for licensing of "PO" process objects:

All SFCs and all block instances which can be operated and observed and produce messages are considered to be PCS 7 process objects. These are the objects that are transferred to the OS and require licenses.

An operating control and monitoring block in CFC has the "S7_m_c" attribute in the block properties.

A process object may include the following blocks and objects:

- Blocks for operating and monitoring a system
- Objects for automation
- Objects for signal acquisition and signal processing (not channel driver blocks)

You can find additional information about process objects in the manual *Process Control System PCS 7 ; Engineering System* for example, in the section "Counting and booking process object licenses".

4.6.4 Calculating the process objects for the SIMATIC station

License key for the AS

The required license key for all SIMATIC stations depends on the total number of process objects loaded and configured in a project (multiproject).

When an AS is loaded, the loaded process objects are evaluated. The following procedure shows you how to calculate the number of process objects configured in a project or multiproject.

PCS 7 V7.0 or higher:

The number of process objects loaded into the AS is calculated by the executing application and is subtracted from the available process objects of the license. The value for the number of available process objects is always updated by the executing application. The license key "AS RT PO" of the type "Countable Objects" is used.

For further information, refer to the section titled "Licensing the PCS 7 software (Page 110)".

Requirement

SIMATIC Manager is open.

Procedure

1. Select the multiproject or project in the component view.
2. Select the **Options > PCS 7 license information** menu command.
The "PCS 7 license information" dialog box opens.
3. Select the entry "Process objects (AS RT PO)" in the left-hand table.

Result

The corresponding number of process objects is displayed in the right-hand window "Configured license objects."

Note

The display of the license objects is based on the multiproject or project selected in the SIMATIC Manager.

The following information is also displayed below the window:

- The existing license.
- The number of licenses currently still available and of process objects that can still be configured with them.

4.6.5 Determining Process Objects of CFC

Overview

The following applies for the licensing of CFC objects:

Licensing of process objects as of V7.0:

Process objects (PO) requiring licenses include objects that are subject to operator control and monitoring **and** can generate messages. These objects have the block attribute "S7_m_c" and require the "PCS 7 - Runtime License AS" license with the "AS RT PO" license key.

The display in the "PCS 7 license information" dialog window can be used to determine the objects subject to licensing. For a description of the procedure see the section "Calculating the process objects for the SIMATIC station (Page 115)".

Additional information

You can find additional information on process objects:

- In the section "Selecting the correct license keys (Page 114) ".
- In the manual *Process Control System PCS 7 ; Engineering System* for example, in the section "Counting and booking process object licenses".

Display of the objects in the "PCS 7 license information" dialog boxes and the statistics function in the CFC editor

The displays in the two dialog boxes differ as follows:

- "PCS 7 license information" dialog box
When the "Process objects (AS RT PO)" option is selected in this dialog box, the objects that can be operated and monitored **and** generate messages are displayed in this dialog box. Only these require a license for process operation and the license key "AS RT PO".
- Statistics function in the CFC editor:
In the CFC editor you can use the **Options > Chart Reference Data** menu command to open the "Chart reference data" dialog box. Statistical values for CFC are displayed by using the **View > Statistics** menu command. The "Block instances" directory displays all the objects that can be operated and monitored under the entry "of which are OCM capable", **regardless** of whether or not they can generate messages.

4.6.6 Calculating the process objects for the operator station

Information on license key levels is available in the catalog ST PCS 7.

License keys authorize users to use a specified number of process objects (PO) or archive values on the operator station. This number is listed in the "Validity" column in Automation License Manager.

License key for OS process objects (OS RT PO)

A defined number of process objects can be operated and monitored with this license key. The number of process objects that can be processed depends on the load on the operator station.

Visualization is possible for up to 2 hours on an engineering station without these license keys.

You must transfer the license keys to the OS servers or OS single station systems (also engineering station).

An OS RT PO license key is not required for an OS client.

You can only use the editors for a limited period of time in demo mode.

Example: OS RT PO (Validity: 2000)

Use this license key to increase the number of project objects permitted in process mode by **2000**.

License key for archive values (WINCC Archive)

A defined number of values can be archived with operator stations with this license key. The number of licenses required for archiving archive values in the OS project depends on the number of values configured for archiving.

You must transfer the license keys to the OS servers, OS single station systems or external archive servers.

Example 2: WINCC Archive (Validity: 1500)

This license key enables you to increase the number of archive values which can be configured for the archive server by **1500** .

Requirements

- SIMATIC Manager is open.
- The "Compile OS" function is executed in the SIMATIC Manager. The number of configured process objects can then be determined.

Procedure

Proceed as follows to determine the configured and licensed process objects and archive values of the OS:

1. Select the multiproject or project in the component view.
2. Select the **Tools > PCS 7 License Information** menu command.
The "PCS 7 license information" dialog box opens.
3. To determine the process objects of the OS, select "OS process objects" in the left table.
The corresponding number of process objects is displayed in the right window, "Configured license objects".
4. To determine the number of archive values of the OS select the entry "Archive tags" in the left-hand table.
To calculate the required "WinCC Archives" license on the central archive server, the total displayed value ("short" and "long") must be smaller than the value of the "WinCC Archives" license.

Note

The display of the license objects is based on the multiproject or project selected in the SIMATIC Manager.

Extending the number of licensed process objects and archive values

- You extend the number of licensed processed objects by installing additional OS RT PO license keys on the operator station (OS server or OS single station system).
- If the short-term archiving of the operator systems is combined with the CAS long-term archiving, the archive tags of the CAS are universally available for short and long-term archiving.
- The number of licensed archive tags can be increased by installing more "WinCC Archive" keys on the PC. The number of licensed archive values is added for each license key. Any "WinCC Archives" license keys can be combined. Take into consideration the following configuration limits:
 - 10 000 tags for OS short-term archiving
 - 120 000 tags for CAS long-term archiving
- "WinCC Archives" license keys to expand the number of licensed archive values are available starting with 1 500 tags.

- In plants without CAS, the license keys of the SIMATIC PCS 7 archives are installed on the plant's PC stations where the archives are stored (OS single station system and OS servers).
- In plants with CAS, the license keys of the SIMATIC PCS 7 archives are installed on the CAS. OS single station systems and OS servers obtain their archive tags from the tags of the CAS.
- With redundant systems, two archives with the corresponding number of archive tags must be configured.

Example

If you need to archive approx. 11,000 archive values, then install the following license keys.

- "WinCC Archive" license key for up to 1500 archive values
(Basic license type; Single; License type: Count relevant; Validity: 1500)
- "WinCC Archive" license key for up to 10000 archive values
(Basic license type; Single; License type: Count relevant; Validity: 10000)

Thus licensing 11,500 archive values.

Insufficient license key

Note

If you open a project with an insufficient number of configurable process objects, the OS program switches to demo mode automatically.

Additional information

Section "Selecting the correct license keys (Page 114)"

4.6.7 Calculating the archive values for the central archive server**Introduction**

The **archive values** of all OS servers in a PCS 7 plant are archived on a central archive server. The sum of the archive values of all OS servers gives the number of licensed archive values. The sum of the archive values in a project or multiproject can be determined with the following description.

License keys for the central archive server

The following license keys are required for the central archive server:

- To use the central archive server: **OS Central Archive Server**
- To use the archives: **WinCC Archive**

Requirement

SIMATIC Manager is open.

Procedure

1. Select the multiproject or project in the component view.
2. Select the **Options > PCS 7 license information** menu command.
The "PCS 7 license information" dialog box opens.
3. Select the "Archive tags" entry in the left-hand table.

Result

To calculate the required "WinCC Archives" license on the central archive server, the total displayed value ("short" and "long") must be smaller than the value of the "WinCC Archives" license.

Note

The representation of license objects is based on the selected multi-project or project in the SIMATIC Manager.

When a redundant OS server is used, the number of archive values must be counted twice.

Additional information

You can find information on how to expand the number of licensed archive values in the section "Calculating the process objects for the operator station (Page 117)".

4.6.8 Calculating the asset tags (hardware components) for the maintenance station

License key for Maintenance Station

The license type of these license keys is "Count relevant license". The licensed scope is added together when several license keys are installed.

This license key allows you to monitor a defined number of diagnostic objects (asset tags).

Example: Existing "Maintenance RT (100)" license key

This license key is sufficient for diagnosing up to 100 hardware components with a Maintenance Station. If you have three Maintenance RT (100) license keys on a Maintenance Station, you will be able to diagnose up to 300 hardware components.

Components with diagnostics capability

The following components with diagnostics capability are classed as asset tags within a PCS 7 project:

- PC stations
- Network components with diagnostics capability (for example, switches)
- Automation systems (CPU)
- Distributed I/O (ET 200 station)
- Field devices with diagnostics capability

Requirement

SIMATIC Manager is open.

Procedure

1. Select the multiproject or project in the component view.
2. Select the **Options >PCS 7 license information** menu command.
The "PCS 7 license information" dialog box opens.
3. Select the entry "Diagnostic objects (Maintenance RT)" in the left-hand table.

Result

The corresponding number of diagnostic objects is displayed in the right-hand window "Configured license objects".

Note

The display of the license objects is based on the multiproject or project selected in the SIMATIC Manager.

4.6.9 Calculating the units for the BATCH station

License key for BATCH station

A defined number of units can be operated and monitored with this license key. The number of units that can be processed depends on the utilization of the BATCH server.

Example: BATCH UNITS (Validity: 20)

The license key for BATCH servers is sufficient to configure up to 20 units.

Requirement

SIMATIC Manager is open.

Procedure

1. Select the multiproject or project in the component view.
2. Select the **Options > PCS 7 license information** menu command.
The "PCS 7 license information" dialog box opens.
3. Select the entry "SIMATIC BATCH units" in the left-hand table.

Result

The corresponding number of SIMATIC BATCH units is displayed in the right-hand window "Configured license objects".

Note

The display of the license objects is based on the multiproject or project selected in the SIMATIC Manager.

4.6.10 Calculating the routes for the route control station

License key for Route Control station

For the process mode of SIMATIC Route Control, the number of active routes (material transports) is relevant and not the number of configured routes. The number of routes active in process mode is based on the process.

Example: Route Control Routes (Validity: 50)

This license key for Route Control servers can be used to simultaneously activate up to 50 routes in process mode.

Determination of routes

The following options are available for determining the number of routes:

- The status bar in the Route Control center shows how many routes were active at the same time after restarting the Route Control server.
- The number of routes can be determined in the "PCS 7 license information" dialog box in the SIMATIC Manager. More information is available in the following text.

Determining the number of routes in the SIMATIC Manager

1. Select the multiproject or project in the component view.
2. Select the **Tools > PCS 7 License Information** menu command.
The "PCS 7 license information" dialog box opens.
3. Select the entry "Route objects (Route Control Server)" in the left-hand table.
The corresponding number of routes is displayed in the right-hand window "Configured license objects".

Note

The display of the license objects is based on the multiproject or project selected in the SIMATIC Manager.

Insufficient license key – server license key is installed

Note

If the Route Control server detects a license key for 30, 100 or 300 routes when powering up, the maximum number of material transports that can occur at any one time is limited to this value. I.e. when the server receives its 31st, 101st or 301st route request, the Route Control center shows that there is no license key or that it has been exceeded. The Route Control server runs on.

Insufficient license key – server license key is not installed

If there is no license key installed on the Route Control server, the server is limited to a maximum of 300 routes (maximum limit). Since the Route Control server has no information on the actual system size, it adopts a safe stance - you can still run the system without a license. The fact that there is no license is indicated on the Route Control center.

New license

If you have installed the license, restart the Route Control server.

4.7 Preparing PC stations

4.7.1 Preparing PC stations - an overview

Introduction

After installing the PCS 7 software, configure and set up the communication interfaces.

Requirements

- The PCS 7 software and PCS 7 hardware have been installed.
- The communications processors have been installed.

Note

To commission SIMATIC PCS 7 BOX, use the manual *Process Control System PCS 7, SIMATIC PCS 7 BOX*.

Overview of the individual steps

The following settings must be performed on all PC stations to allow all automation systems (AS) and PC stations (for example OS, BATCH) of a PCS 7 project to be configured, loaded and tested from one central engineering station (ES).

These settings first have to be made on the central engineering station.

Step	What?
1	Create the "Logon_Administrator" user group for SIMATIC Logon (Page 126)
2	Set the language for a user (MUI) (Page 127)
3	Set the communication module for connecting to the terminal bus (Page 128)
4	Set up the connection between the PC station and plant bus (Page 129)
5	Set the standard network adapters (Page 131)
6	Change the transfer rates and operating modes in the PC network (Page 132)
7	Install security patches, hotfixes, service packs (Page 133)
8	Activate redundancy for high-availability PCs (Page 136)
9	Download the network configuration to the PC stations (Page 138)

4.7.2 SIMATIC Logon

Note on the use of chip cards

- **USB chip card readers**

When using a USB chip card reader or the serial chip card reader, use the chip card driver. You can find information on the availability of the driver in the *PCS 7 Readme*. You can find a description of the chip card readers in the section "Overview of additional devices and drivers for PCS 7 (Page 105)".

- **Using chip cards**

Make sure that you reformat all chip cards that were formatted with SIMATIC Logon prior to V1.3. This is necessary because SIMATIC Logon uses improved encryption for chip cards as of version V1.3. If you attempt to logon with a chip card that is not updated, the attempt will fail. However, you can always log on with your user name and password via the keyboard.

If you have logged on with a chip card and remove this chip card during configuration in the SIMATIC Logon role management, all the changes that you have not saved up to this point are discarded. Reinserting the card will not solve this problem.

Notes on the Windows workgroup

If you require high availability, you need to work in a domain structure, since no redundancy is offered by SIMATIC Logon in a Windows workgroup.

Notes on the SIMATIC Logon Event Log Viewer

If you want to print the events in the event log, proceed as follows:

- Click "Export" and export the events in PDF format.
- Print out the exported file.

Instead of the file size of the event log, the number of recorded events is displayed based on the configured filter.

The filter dialog always shows the date and time based on the settings you have selected for the date and time in Windows. Display in conformity to ISO 8601 is not possible.

4.7.3 How to authorize users to configure SIMATIC Logon

Introduction

SIMATIC Logon and SIMATIC Electronic Signature simplify the validation of plants in accordance with FDA 21 CFR Part 11. In plants in which SIMATIC components are used, the validation of the plant can be performed using the following components:

- **SIMATIC Logon**
Assign user-specific permissions
- **SIMATIC Electronic Signature**
Query and archive the required documentation

If you want to use the SIMATIC Logon for access protection in a PCS 7 plant, you need to add users who want to configure SIMATIC Logon to the "Logon_Administrator" user group. Enter these users in one of the following groups:

- On the local PC -
In the local Windows "Logon_Administrator" group
- In a domain that is accessible from the local PC -
In the "Logon_Administrator" Windows group in the Active Directory

Note

The local Windows group "Logon_Administrator" is created automatically when you install SIMATIC Logon.

Basic procedure

1. Open the user management.
2. Select the "Logon_Administrator" group in the list.
3. Assign all users who want to work with the "Configure SIMATIC Logon" dialog box to the "Logon_Administrator" group.

Note

You should only assign users to the "Logon_Administrator" Windows group. If you assign subgroups to the "Logon_Administrator" Windows group, the members of the subgroups will be blocked from accessing the "Configure SIMATIC Logon" dialog box. It is not possible to authenticate any members of a subgroup.

Users in a Windows domain

Note

SIMATIC Logon users must be direct members of a Windows group. These users may not be members of a subgroup of a Windows group.

Requirements for defining user roles with SIMATIC Logon

- SIMATIC Logon is installed on every PC with a PCS 7 application.
- The group "Logon_Administrator" is created on one PC (logon computer).

Information on the next steps

- You will find instructions on how to use SIMATIC Logon to set-up user roles and assign them to the defined Windows user groups in the manual *SIMATIC; SIMATIC Logon*.
- You will find information on the additional settings you need to make in the documentation relating to the applications that use SIMATIC Logon for access management purposes.

Additional information

- Manual *SIMATIC; SIMATIC Logon*

4.7.4 Setting the user language (MUI)

Introduction

To work with PCS 7 optimally, we recommend that you make all the language settings to meet the needs for the specific system.

In PCS 7 you can set the interface language to one of the following for the engineering system and for process mode (depending on the languages installed):

- Chinese
- German
- English
- French
- Italian
- Spanish

Requirement

An operating system with a multilanguage user interface is installed.

Note

When installing the central archive server and StoragePlus, set the same language for the logged on user and the default user.

Settings of the region and language options

- Regional settings
Recommendation: Make these settings in accordance with your PCS 7 plant.
- Language for menus and dialog boxes
Select the required language.

Note

The drop-down list only contains languages which are installed.

- Advanced settings for standard users (all new users):
Recommendations:
 - Language for programs that do not support Unicode:
The language in which you want to install PCS 7.
 - Code page conversion tables
The language in which you want to install PCS 7.
 - Select the default settings for user accounts so that all settings are applied to the current user account and the standard user profile.

Note

Once the central archive server and StoragePlus have been installed, you can change the language for the default user.

Reboot

Reboot the PC station if you are prompted by Windows to do so after you have changed the language.

4.7.5 How to set the communication module for connecting to the terminal bus

Introduction

Below you can find information about how to select the communication modules for connecting to the terminal bus you will use to configure the PC stations.

Note

If you use a PC station as a single-station system with no connection to other PC stations, the following steps do not need to be taken.

Setting the network connection to the terminal bus

1. Select the PC station (My Computer) in the tree view of Windows Explorer.
2. Select the "SIMATIC Shell" folder.

3. Select the **Settings** command from the shortcut menu.
The "Select Terminal Bus" dialog box opens.
4. In the "Network Adapters" group, select the communication module via which you want to communicate on the terminal bus.
5. Click "OK".

Note

If you confirm the dialog box that follows, the network connection to this PC station will be temporarily interrupted.

6. Confirm the dialog box that follows.
The network adapter is reinitialized.

Configure connection sequence for several network adapters

1. Open the advanced settings in the "Network Connections" dialog.
2. Select the "Adapters and Bindings" tab.
3. Check that the connection via which the PC station on the terminal bus is to communicate is at the top of the "Connections" list. If necessary, move this connection to the top.

Note

If redundant network adapters are used, the shared TEAM connection must be at the top of the list. You can find additional information on this in the manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*.

Note

Once new network adapters have been installed, the most recently entered connection appears at the top of the list.
Ensure that the connection via which the PC station on the terminal bus communicates is at the top of the list.

4. Click "OK".

See also

How to activate redundancy for fault-tolerant PCs (Page 136)

4.7.6 How to set up the connection between the PC station and plant bus

Introduction

You next check or assign the addresses on the plant bus and the access point for downloading and configuring the PC stations.

Perform the following steps:

- PC stations on the plant bus
Check or assign addresses of the network adapters:
 - PC station on plant bus connected via CP 1613 or CP 1623 communications processor.
 - PC station on plant bus connected via standard network adapter (only if the ISO protocol is used on the plant bus).
- All PC stations:
 - Check the access point for each PC station.

Requirement

The "Set PC Station" configuration console has been opened via the Start menu and SIMATIC NET folder.

PC station on plant bus connected via CP 1613 or CP 1623 communications processor

If the PC station on the plant bus is to communicate via the CP 1613 or CP 1623 communications processor, perform the following steps for all CP 1613 processors:

Note

If you have reinstalled the PCS 7 software on the PC station, the first two steps preceded by "Standard" are not required.

1. "Standard": In the tree view, select "Modules > <Name of Network Adapter for Communication with the Plant Bus> > General".
2. "Standard": Set the operating mode to "PG mode" for **every** PC network module you want to configure.
3. In the tree view, select "Modules > <Name of Network Adapter for Communication with the Plant Bus> > Address".
4. Set the addresses (either TCP/IP address or MAC address, depending on the protocol).

PC station on plant bus connected via standard network adapter

If you want to use the ISO protocol on the plant bus, but you do not know the MAC addresses of the network adapters, perform the following steps for all standard network adapters:

1. In the tree view, select "Modules > <Name of Network Adapter for Communication with the Plant Bus> > Address".
2. Make a note of the MAC address, which you will need when configuring the PC station.

Check the access point for each PC station.

Perform the following steps on all PC stations:

1. In the tree view, select the "Access Points" folder.
2. In the list, select "S7ONLINE".

3. Select **Properties** in the context menu.
The "S7ONLINE properties" dialog box opens.
4. Check the entry in the "Assigned interface parameter assignment" box. "PC internal (local)" must be set. Change the settings, if necessary.
5. Click "OK".

4.7.7 How to make the settings for standard network adapters

Procedure

If you want to use the TCP/IP protocol on the plant bus, you will need to perform the following tasks for all standard network adapters on the plant bus:

1. Open the dialog for setting the Network Connections.
2. Select the plant bus in the "Network Connections" dialog box.
3. Select the menu command **File > Properties**.
4. Select the "Internet Protocol (TCP/IP)" item from the displayed list.
5. Click "Properties".
6. Configure the TCP/IP address:
Typical: "Use the following IP address:" check box
 - Enter the IP address.
 - Enter the subnet mask.
7. Click "OK".
The TCP/IP addresses are set.

Settings when using two or more network adapters

Note

Setting the order

If several standard network adapters are used, the adapter for the terminal bus must appear first. (Network Properties: "Advanced > Advanced Settings"). Any non-functioning network adapters which are inserted must be disabled.

Following a PCS 7 installation, a dialog box appears in which you must select the network adapter for the terminal bus. When an adapter is selected, confirm it with "OK" and then confirm the "Reinitialize" dialog box with "Yes".

4.7.8 How to change the transmission rate and the mode in the PC network

Introduction

For communication in a network, ensure the following parameters are set consistently for all network nodes:

- Transmission rate
- Operating mode

Note

The factory settings for Siemens devices are set so that parameters for the transmission rate and operating mode are identified **automatically** (autonegotiation).

This setting **only** needs to be changed if nodes which do not have access to the "Autonegotiation" setting must be communicated with in the network.

Automatic identification of the transmission rate and operating mode

Autonegotiation refers to the automatic identification/negotiation of the transmission rate (10/100 Mbps) and the operating mode (full duplex/half duplex).

- Full duplex is an operating mode with bidirectional data communication, where the communication partners can send data on the transmission link independently of one another.
- Half duplex is an operating mode with bidirectional data communication, where only one communication partner can send data on the transmission link.

Requirement

The "Autonegotiation" setting needs to be changed if nodes which do not have access to this setting must be communicated with in the network.

Configuring network nodes

Location of use	Network node	Opening the configuration dialog window	Parameter setting
PC	Communication module CP 1613 or CP 1623	1. In the Start menu, in the SIMATIC NET folder: Set PC Station 2. PC Station > Modules > Network Parameters	Activate option buttons for duplex mode and transmission rate.
PC	INTEL network adapter (or other similar standard network adapter) setting	1. Open the Network Adapters via the Start menu > Device Manager 2. Select network adapter. 3. File > Properties 4. "Advanced" tab	Set values for the property. Typical property designation (depending on the network module used): • Link Speed & Duplex Mode • Link Speed & Duplex
Switches	SCALANCE X-400 SCALANCE X-300 SCALANCE X-200 SCALANCE X-200 IRT ESM OSM	• Configuration via Telnet or Web Based Management (WBM) • Open the configuration dialog box for the switch via Internet Explorer: <code>http : \\<TCP/IP address></code>	Port configuration
AS	Communication module CP 443-1	HW Config: CP 443-1 properties > "Options" tab > "Individual Network Settings" group	In the "Transmission medium/Duplex" drop-down list (default setting: "Automatic setting")

More information

- Operating Instructions *SIMATIC NET; Industrial Ethernet Switches SCALANCE X-200*
- Operating Instructions *SIMATIC NET; Industrial Ethernet Switches SCALANCE X-300*
- Operating Instructions *SIMATIC NET; Industrial Ethernet Switches SCALANCE X-400*
- Manual *SIMATIC NET; Industrial Ethernet Switches; SCALANCE X-300; SCALANCE X-400*
- Manual *SIMATIC NET; Industrial Ethernet OSM/ESM*

4.7.9 Installing security patches, hotfixes, service packs

Introduction

Security patches, hotfixes, and service packs are software packages, which serve to eliminate security vulnerabilities, unwanted software properties, and similar.

Information is provided with the software package explaining the properties that need to be changed and the requirements for its installation.

Note

You will find information on the software version for the current PCS 7 version in the pcs7 readme file.

Microsoft security patches

Siemens tests the compatibility of Microsoft security patches for the Microsoft operating system, the SQL server and Internet Explorer. You will find information on security patches for PCS 7 online from SIMATIC Customer Support under the entry ID: 18490004 (<http://support.automation.siemens.com/WW/view/en/18490004>).

More information

- Section "How to install service packs for the operating system (Page 77)"

4.7.10 Enable and configure SNMP

Introduction

You can monitor SNMP-enabled components with the maintenance station. SNMP-enabled components include:

- PC stations - SIEMENS Industrial PC (IPC)
- Network components
 - Switches (SCALANCE X...)
 - ESM and OSM
 - Communications processors
- Other devices
 - Network adapters
 - Switches

The OPC server is used for diagnostics of SNMP-enabled components. SNMP must be enabled and configured on the PC stations that are to be monitored by the maintenance station.

Enabling SNMP

Enable only the protocol or the service listed in the table.

Operating system	SNMP or SNMP service
Windows XP	Simple Network Management Protocol
Windows Server 2003	
Windows Server 2003 R2	
Windows 7	
Windows Server 2008 (32-bit)	SNMP service
Windows Server 2008 R2	

Configuring SNMP

1. Open "Services" under Computer Management.
2. Select the item "Simple Network Management Protocol" or "SNMP Service".
3. Select the shortcut menu command **Properties**.
4. Open the "Security" tab.
5. Select one of the following options:
 - "Accept SNMP packages from **any** host" option:
 - No other settings are required.
 - "Accept SNMP packages from **these** hosts" option:
 - The local address or the local PC name and the address of the maintenance station must be entered for the station being monitored. Both addresses are needed for a redundant MS server.
 - The local address or the local PC name must be entered for the maintenance server.
6. Enter the name with read/write access used in the configuration under "Accepted community names".

Setting up cross-network communication links

You should follow the recommendations in the following document if you wish to set up cross-network communication links:

White paper *PCS 7 process control system; Security concept PCS 7 and WinCC - Basic document*

You can find information on availability in the *PCS 7 Readme*.

4.7.11 How to activate redundancy for fault-tolerant PCs

Principle

The following basic steps are required to configure redundant stations.

1. Redundancy cable for PC stations:
You need to establish a connection through a redundant cable for redundant PC stations.
The redundant stations are the PC stations of a pair (server and single station systems).
2. Select the redundancy interface:
For the redundancy connection between two PC stations, you need to configure the connection path directly on the redundant PC stations.
3. With a server-client architecture, you will need to assign the clients to the servers.

Redundant cable for PC stations

The following redundancy connection options exist:

- With BATCH servers:
Network cable (cross-over cable) to an additional Ethernet network adapter.
If using a PC as a BATCH server, this is the only type of redundancy connection permitted!
- With OS servers and Route Control servers:
Null-modem cable to COM interface or network cable (cross-over cable) to an additional Ethernet network adapter.

Selecting the redundancy interface

If you want to establish a redundancy connection between two PC stations, OS servers for example, you need to select the connection path to the redundant partners.

A redundancy connection can be established via the "serial port" or a "network adapter".

- BATCH server (redundancy connection only possible through an additional network adapter!)
- OS server
- Route Control server
- Maintenance server
- Central archive server
- Single station systems

You can make the following settings directly on each of the mutually redundant servers and single station systems.

1. Select the PC station (My Computer) in the tree view of Windows Explorer.
2. Select the "SIMATIC Shell" folder.
3. In the shortcut menu, select the menu command **Redundancy Settings**
The "Redundancy Settings" dialog box opens.

4. In the "Optional connection to the redundant partner" area, configure the connection path.
For a serial connection:
 - Select the item "COM1" or "COM2" " " in the "Serial port" drop-down list.
 - Select the "-----" item in the "Network adapter" drop-down list.For connection via an additional network adapter:
 - Select the "-----" item in the "Serial port" drop-down list.
 - Select the desired network adapter in the "Network adapter" drop-down list.
5. Click "OK".

Additional steps for servers and single station systems (OS, BATCH)

After connecting the PC stations with a redundancy cable and selecting the redundancy interface:

1. Follow the instructions in the function manual *Process Control System PCS 7; Fault-Tolerant Process Control Systems*.

Additional steps for clients (OS, BATCH)

Connect the clients with the redundant servers:

1. Follow the instructions in the function manual *Process Control System PCS 7; Fault-Tolerant Process Control Systems*.

Additional steps for SIMATIC Route Control

1. Follow the corresponding instructions contained in the manual *Process Control System PCS 7; SIMATIC Route Control*.

See also

How to set the communication module for connecting to the terminal bus (Page 128)

4.7.12 How to disable user switching

Introduction

For PCS 7, the use of the Windows functionality "Fast user switching" with Windows 7 / Server 2008 / Server 2008 R2 is not permitted for changing the Windows user.

The administrator should disable the application of this function by means of a group policy.

NOTICE
Fast user switching
The application of this function can trigger unwanted reactions, e.g. the restart of a PC station.

Requirement

- Execution with Administrator login

Procedure

1. Enter the following in the Start menu "Run" dialog: "gpedit.msc".
The "Editor for local group policies" opens.
2. In the tree view, select **"Local Computer Policies > Computer Configuration > Administrative Templates > System > Logon"**.
3. Enable the option "Hide entry points for fast user switching".
4. Apply the settings.
The "Fast user switching" function is no longer available in the Windows Start menu after logoff.

4.7.13 Downloading the network configuration to the PC stations

Introduction

To allow you to configure, download and test all automation systems and PC stations (OS, BATCH, RCS) of a PCS 7 project from a central engineering station (ES), make the following network settings and download the configuration to all PC stations.

Additional information

The required steps are described in the configuration manual *Process Control System SIMATIC PCS 7; Engineering System*.

4.8 Notes on add-ons and utilities

4.8.1 Overview of add-on programs and utilities for PCS 7

Introduction

This section provides you with information on add-ons and utilities for PCS 7.

Overview

- Add-ons:
 - Remote diagnostics functions (Page 139)
 - Virus scanners (Page 143)
 - Burner software (Page 143)
 - DiagMonitor (Page 144)
- Utilities:
 - Screen savers (Page 146)
 - Defragmentation programs (Page 146)

4.8.2 Remote diagnostics functions

Security requirements

If you want to perform remote diagnostics on a PCS 7 plant, you must protect that plant against unauthorized access.

Several steps have to be taken in order to implement a security concept. Only when taken together as a whole will these security measures offer the plant optimum protection.

Transmission paths

Data can be transmitted on the following paths:

- Telephone line (modem)
- Network connection (e.g. in-plant network TCP/IP connection)

Remote service and remote operation

For PC stations, we recommend the following tools for remote diagnostics and administrative access to PCS 7 plants:

- **VNC**
 - The "RealVNC" Enterprise Edition software has been approved for use for remote service access as of PCS 7 V8.0 .
You can find the RealVNC version compatible with your PCS 7 version under the regularly updated Entry ID 2334224 in the Industry Online Support:
Internet link <http://support.automation.siemens.com/> (<http://support.automation.siemens.com/WW/view/en/55422236>)
 - You can find more information about the use of "RealVNC" in PCS 7 plants in the Industry Online Support under Entry ID 55422236:
Internet link <http://support.automation.siemens.com/> (<http://support.automation.siemens.com/WW/view/en/55422236>)
- **RDP**

The use of the Remote Desktop Protocol (RDP) is solely allowed for remote maintenance of PCS 7 clients. No server services (for example, Web Navigator Server, Data Monitor Server, OPC server) should be running on these computers.
The reason for this lies in the handling of remote desktop sessions with the Microsoft operating system. The RealVNC software should be used for remote access to other computers in a distributed PCS 7 system (for example, OS servers, CAS, engineering stations).
- **NetMeeting**

only possible with the Windows XP and Windows Server 2003 operating systems

Using the Remote Desktop Protocol (RDP)

- Access via RDP may only be gained by means of console takeover with the same user, or initial login ("/admin" or "/console" parameter when connecting)
- Administrator rights are required for initial login on a PC with a server operating system.
- The user must be member of the appropriate "HMI group" of the target computer (see section "Setting up user groups and users (Page 91)"). A **maximum of 1** user is permitted per target computer.

- Actions via RDP:
 - Hot restart/restart of the PC with corresponding logon
 - Setting up/configuration of computer

Note**Non-supported functions**

The following actions are not supported via RDP:

- Operator control and monitoring process mode
- Multiple logons to the operating system

- Access to computers via RDP should only be temporary and not static.

Note**PCS 7 Web client**

The above restrictions do not apply when using a PCS 7 Web client as terminal service.

Setting up approvals for NetMeeting when firewall is enabled (only Windows XP / Server 2003 / Server 2003 R2)

If the Windows firewall is activated, you need to set up exceptions for the use of NetMeeting.

1. Open the dialog for Windows Firewall settings via the Control Panel.
2. Select the "Exceptions" tab.
3. Check the "Remote Desktop" box.
4. Click "Add Program...".
The "Add a Program" dialog box opens.
5. Click "Browse".
Select the "NetMeeting" program folder.
6. Select the "conf.exe" file.
7. Click "Open". Click "OK".
The "conf.exe" program is added to the "Programs and Services" list. The "conf.exe" box is checked for the program.
8. Select "conf.exe" in the "Programs and Services" list.
9. Click "Edit".
The "Edit Program" dialog box opens.
10. Click "Change scope...". Make your plant-specific setting. The recommended setting is "User-defined list". Enter the addresses of the authorized computers. Click "OK".
11. Click "OK". The "Windows firewall" dialog box opens and the "Exceptions" tab selected.
12. Click "Program ...". The "Add program" dialog box opens.
13. Click "Browse".
14. Select the file "mnmsrv.exe" in the operating system's system folder.
With a standard installation, you can find this file in the Windows "System32" folder.

15. Click "Open". Click "OK".
The "mnmsrvc.exe" program is added to the "Programs and Services" list. The "mnmsrvc.exe" box is checked.
16. Click "Edit".
The "Edit Program" dialog box opens.
17. Click "Change scope...". Make your plant-specific setting.
The recommended setting is "User-defined list". Enter the addresses of the authorized computers. Click "OK".
18. Click "OK". The "Windows Firewall" dialog box opens.
19. Click "OK". The settings will be accepted.

Additional information

- Section "Subsequent installation or updating (Page 97)"
- White paper *PCS 7 Process Control System; Security Concept PCS 7 and WinCC - Basic Document*
You can find information on availability in the *PCS 7 Readme*
- Operating system online help
- Internet: [http:// support.microsoft.com/kb/878451/en-us](http://support.microsoft.com/kb/878451/en-us) (<http://support.microsoft.com/kb/878451/en>)

4.8.3 How to configure Auto-Logon

Introduction

If a PC station is to be automatically logged on after starting up, you can enable automatic logon for Windows in Windows workgroups. This method cannot be used in a domain.

Requirement

The PC station is in a Windows workgroup.

Note

The passwords entered in the "Automatically Log On" dialog box are not checked for validity. If passwords are invalid, the automatic logon during startup of the PC station does not work.

Procedure

1. Enter the following in the Start menu "Run" text box: "control userpasswords2".
2. Click "OK".
The "User Accounts" dialog box opens.
3. In the "Users" tab, select the appropriate "User" (for example, S_User) in the "User for this computer" list and disable the "Users must enter a username and password to use this computer" option.
Then click "Apply".
The "Automatically Log On" dialog box opens.
4. Enter the password for the selected user in the "Password:" as well as "Confirm Password:" fields and confirm with OK.
5. Close the "User Accounts" dialog box with OK.
Automatic logon is now configured. After rebooting or a new startup of the SIMATIC PC, the Windows logon is performed automatically and you can launch your application immediately.

Additional information

- Be aware that the Enhanced Write Filter (EWF) must be deactivated in Windows embedded operating systems before making this change.
- This method has the advantages that you can avoid having to directly edit the Windows registry and that the password is stored encrypted.
- The "Automatically Log On" window is only opened with a click on the "Apply" or "OK" button when immediately prior to this the "Users must enter a username and password to use this computer" check box has been cleared.
- If automatic logon is already configured but you want to make changes, select the "Users must enter a username and password to use this computer" check box once and then clear it again. Now you can click "Apply" or "OK" and the "Automatically Log On" window appears.
- In a SIMATIC IT environment, ensure that the "Automatic Windows user logon" option is activated in the SIMATIC IT Management Console under Settings > System > Security.

4.8.4 Virus scanners

You can find information about the virus scanners for the current PCS 7 version in the *pcs7 readme* file.

4.8.5 Burner software

Introduction

In the interests of maintaining performance levels, data archiving devices should not be used on PC stations in process mode. We recommend that you only use data archiving devices (for example CD/DVD burners) on the engineering station.

Application

If you have purchased an engineering station as part of a product bundle, this package will include burner software. This burner software can be installed after the main installation. During installation, follow the instructions of the burner software manufacturer.

4.8.6 DiagMonitor

Introduction

The DiagMonitor software is used for early detection and reporting of hardware and temperature problems on the SIMATIC PC. Messages can appear via:

- Ethernet (SNMP)
- Internet/telephone
 - E-mail
 - SMS
- OPC (forwarded to the SIMATIC software applications)
- Web browser

The DiagMonitor software monitors, reports, alarms and visualized application-specific operating states on SIMATIC PCs.

Requirements

The corresponding hardware and software requirements must be observed when using DiagMonitor software.

Note

You can find detailed and current information about the approved PC types and operating systems in the manuals *DiagMonitor Getting Started* and *PC DiagMonitor Software*.

- Hardware
Only SIMATIC PCs used with PCS 7 are employed as monitored PCs (see *ST PCS 7* catalog and *PCS 7 Readme*).
- Operating systems
The operating system-specific DiagMonitor software can be used with operating systems that are released for SIMATIC PCS 7 (see *PCS 7 Readme* - Read the information on updates).
- The SNMP service is enabled.
You can find additional information on this in the section "Enable and configure SNMP (Page 134)".

Restrictions

Note

Remote monitoring is only possible with the TCP/IP Internet protocol since the required SNMP protocol is available in this protocol family.

Installing the DiagMonitor software

1. Install the DiagMonitor software available for your PC. You can find information on the availability of the DiagMonitor software in the PCS 7 readme.
Execute the following files:
 - DiagMonitor_Silent_Install.bat
 - CM_Activate.exe
2. Reboot the computer.

SNMP configuration

1. Open the administration of services.
2. Open the property dialog under "SNMP service" or "SNMP" with a double-click and go to the "Security" tab.
3. Select one of the following options:

Enable the following option,	then make the following settings
"Accept SNMP packages from any host"	No additional settings required
"Accept SNMP packages from these hosts"	• Monitored station: The local address or the local computer name and the address of the maintenance station (both addresses for a redundant MS server) • Maintenance server: Local address or local computer name

4. Enter the name with read/write access used in the configuration under "Accepted community names".

Configuring DiagMonitor

Note

The diagnostic monitor's "Management Station" configuration tool can only be started by a user with administrator rights.

Perform the configuration on all monitored stations.

1. Select the menu command **PC DiagMonitor > Management Explorer** in the Start menu under SIEMENS SIMATIC products to start the SIMATIC PC DiagMonitor.
2. Make the following settings:
 - Select the menu command **Station > Add...** and select "Local station".
 - If desired, configure the necessary events, e.g., cyclic operating hours alarms.

Optional setting

If you want to stop the "SIMATIC PC DiagMonitor" Management Station from automatically starting up each time someone logs on, deselect the item "Start with Windows session" under **Tools > Settings....**

4.8.7 Screen savers

Using a screen saver

It is **not** recommended to use a screen saver on the PC with PCS 7 for the following reasons:

- The screen saver uses CPU time and may therefore cause the system to be overloaded.
- The screen saver reduces the amount of RAM that can be used continuously. There are screen savers with which the amount of RAM used by the screen saver is not freed up.

If you use a screen saver, you should deactivate it when operating PCS 7.

4.8.8 Defragmentation programs

Information about authorizations

Authorizations cannot be saved on a license key USB stick. In this section, we only use the term "license key", even if a product uses "authorizations".

Using defragmenters

Defragmentation programs are used to optimize the time it takes to access a hard disk.

Note

Defragmentation programs that move fixed blocks can destroy license key files required for the authorization of software packages.

Recommendation:

Always exclude the license keys from editing before using the defragmentation program.

Excluding license keys from editing

You can exclude the license keys from editing as follows:

- Transfer all license keys to another storage medium, for example license key USB stick/ license key diskette.
- Transfer all license keys to a partition that is not defragmented, for example the security partition.

4.8.9 WinCC/DataMonitor

The SIMATIC WinCC/DataMonitor provides WinCC process data to all functional levels of a company via intranet/Internet with standard tools.

Current process states and historical data are displayed and evaluated with powerful tools. The production can then be efficiently monitored and analyzed. Information prepared and presented in the form of Web pages and reports can be prepared and made available for specific target groups. The DataMonitor client, an office PC for example, accesses the data on the DataMonitor server, which is installed on a WinCC server, for example.

WinCC/DataMonitor includes the following functions and analysis tools that can be optionally used depending on application:

- The "Process screens" function is used purely for monitoring and navigation via WinCC process pictures with MS Internet Explorer as a so-called "view-only client". The DataMonitor here uses at the server end the same mechanisms as WinCC Web Navigator, for example, for communication, user management and display of graphical data.
- The "Web Center" function serves as a central information portal for user-specific views. On a Web Center page, the user can assemble and save the displayed objects of the DataMonitor, the so-called Web parts, as screen views. In addition, the user manages access to the DataMonitor and process data in the "Web Center".
- The "Trends and Alarms" function is used to display and analyze historical data from the WinCC Runtime / Central Archive Server or from the WinCC long-term archive servers. The data is displayed in predefined Web pages in tables and charts. The user only needs to link the tables and charts with the desired WinCC archive data. The data created in this way can be exported to a CSV file for further processing.
- The "Excel Workbooks" function is a reporting tool that integrates messages, archive data and current process values from WinCC in MS Excel and thereby provides supports for online analysis. The created Excel workbooks can be published and then be made available for intranet/ Internet. Excel workbooks can be published as templates for the "Reports" function to create reports with WinCC data.
- Using the "Reports" function, users can trigger the time-driven or event-driven reports. The reports can be generated from WinCC print jobs, or from published Excel workbooks. This makes available statistics and analysis of specific process data or historical data, for example. The reports are stored in PDF format and can be forwarded by e-mail, if desired.

Additional information

You can find information on SIMATIC WinCC/DataMonitor in the online help for SIMATIC WinCC/DataMonitor. Path on the Process Control System; SIMATIC PCS 7 DVD:
23_DataMonitor__V...\Documents\<Sprache>

Appendix

5.1 Appendix A - Use of software packages

5.1.1 Software packages for basic engineering

Brief description of the basic engineering applications

The following applications are installed during the PCS 7 system setup from the Process Control System; SIMATIC PCS 7 DVD for basic engineering. License keys are required for use.

You can find additional information in the section "Licensing and authorizing the PCS 7 software (Page 110)".

Applications	Brief description
Automation License Manager	For transferring and managing license keys
STEP 7	PCS 7 basic engineering: • SIMATIC Manager for managing project objects • HW Config for the hardware configuration • NetPro for the network configuration
SCL	Structured Control Language (S7 SCL) High-level language for programming user function blocks in accordance with IEC 61131-3
CFC	Continuous Function Chart (CFC) - For the graphical configuration of continuous automation functions in accordance with IEC 61131-3, with test and commissioning functions
SFC	Sequential Function Chart (SFC) - For the graphical configuration of sequential production sequences (step sequencers), with test and commissioning functions
PH	Plant Hierarchy (PH) - For displaying a project in a plant view; which enables the user to gain a quick overview of project resources
IEAPO	• Process Object view (PO) - For providing a process-control oriented view of basic automation data • Import Export Assistant (IEA) You will find more information on this topic in the section "Optional software packages (Page 152)".
PCS 7 Library	Standardized process-control libraries with preconfigured and tested blocks and drivers for hardware (e.g., blocks for I/O modules)
WinCC	Visualization and configuration software containing standards for the fast implementation of simple to complex visualization tasks in single or multiple station operation
AS-OS Engineering	AS/OS connection for faceplates, messages, and tags
PV InsInfo-Server	Tool which supplies the WinCC variable browser with ES variables

Applications	Brief description
SIMATIC NET PC Software	Software components for configuring and identifying network adapters installed in the PC
BATCH Engineering	Components for BATCH Engineering: BATCH Base, BATCH Builder, BATCH Blocks, BATCH WinCC Client Options, BATCH WinCC Server Options, BATCH Getting Started You will find more information on this topic in the section "Software packages for SIMATIC BATCH (Page 151)".
Route Control Engineering	Components for Route Control Engineering: Route Control Base, Route Control Engineering, Route Control Library, Route Control Faceplates You will find more information on this topic in the section "Software packages for SIMATIC Route Control (Page 152)".
PDM	Components for engineering field devices You will find more information on this topic in the section "Optional software packages (Page 152)".

5.1.2 Software packages for operator stations

Brief description of the operator station applications

The following applications are installed during the PCS 7 system setup from the Process Control System; SIMATIC PCS 7 DVD for operator stations. License keys are required for use.

You can find additional information on this in the section "Licensing the PCS 7 software (Page 110)".

Program name	Brief description
Automation License Manager	For transferring and managing license keys
WinCC	Visualization and configuration software for visualization in single or multiple-station operation License key levels: You can find additional information on this in the section "Selecting the correct license keys (Page 114)".
SFC Visualization	Allows you to display and operate sequence control systems.
PCS 7 Faceplates	Contains standardized libraries with pre-produced and tested blocks (connection to AS and faceplates).
SIMATIC NET PC-Software	The software components included can be used to configure and detect the network adapters fitted in the PC.

5.1.3 Software packages for SIMATIC BATCH

Brief description of SIMATIC BATCH applications

The following applications are installed during the PCS 7 system setup from the Process Control System; SIMATIC PCS 7 DVD for SIMATIC BATCH. License keys are required for use.

You can find additional information in the section "Licensing and authorization of the PCS 7 software (Page 110)".

Program name	Brief description
Automation License Manager	For transferring and managing license keys
BATCH Base	Basis for all BATCH installations Contains installation of the client database You will need a license key for BATCH API to interface to a higher-level information system.
BATCH Builder	Software package that is installed on the PCS 7 ES and is used to configure BATCH project data.
BATCH Fastobjects	For installing a database server
BATCH client	- The Batch Control Center (BatchCC) is the central component in SIMATIC BATCH for batch scheduling and batch control. BatchCC manages all the data of relevance for SIMATIC BATCH, enabling you to also log all data in the BatchCC. - The BATCH recipe editor is responsible for creating simple graphics and managing any number of recipes. - BATCH REPORT - The convenient BATCH printing function
BATCH Server	- BATCH sequence control system and allocation of units - Batch data management records, saves, logs and exports batch data - License key levels: You can find additional information on this in the section "Selecting the correct license keys/authorizations (Page 114)".
BATCH Blocks	BATCH interface blocks
BATCH WinCC Client Options	Faceplates for the PCS 7 OS
BATCH WinCC Server Options	Faceplates for the PCS 7 OS
BATCH Getting Started	Sample project for SIMATIC BATCH

5.1.4 Software packages for SIMATIC Route Control

Brief description of the applications for SIMATIC Route Control

The following applications are installed during the PCS 7 system setup from the Process Control System; SIMATIC PCS 7 DVD for SIMATIC Route Control. License keys are required for use.

You can find additional information in the section "Licensing and authorization of the PCS 7 software (Page 110)".

Program name	Brief description
Automation License Manager	For transferring and managing license keys
Route Control Base	Basis for all Route Control installations Contains documentation on SIMATIC Route Control.
Route Control client	For in-depth diagnostics of the route and its elements
Route Control Engineering	For producing and managing any number of sub-routes with elements
Route Control server	For searching for routes and as an interface between the Route Control center and/or PCS 7 OS and the automation systems License key levels: You can find additional information on this in the section "Selecting the right license keys/authorizations (Page 114)".
Route Control Library	Contains interface blocks for interconnection with user and other process blocks and faceplates for monitoring and operating routes on the Route Control client.
Route Control Faceplate	Faceplates for the PCS 7 OS

5.1.5 Optional software packages

Introduction

The following applications can be used for engineering special applications. You will need additional license keys.

You can find additional information in the section "Licensing and authorization of the PCS 7 software (Page 110)".

Note

Information on the software version of the latest PCS 7 version is available in the *Process Control System PCS 7; PCS 7 Readme* file.

Add-ons in the PCS 7 setup

You install these applications via the PCS 7 system setup.

Applications	Brief description
IEAPO	Import-Export-Assistant (IEA) - Tool for rapid bulk engineering (e.g. importing models and process tags) Note: License needed for IEA
S7-PLCSIM	CPU Simulation
SFC Visualization	The SFC visualization option allows you to display and operate sequence controls.
VXM (Version Cross Manager)	Version comparison of engineering data with graphic differential display
PCS 7 PID Tuner	Optimization of control loops
DOCPRO	This is used to produce system documentation and circuit manuals.
OpenPCS 7	OPC interface as basis for the exchange of data throughout the company
PCS 7 Faceplates; PCS 7 Basic Faceplates; PCS 7 Advanced Faceplates	Faceplates for the operator station
DotNet Framework (also ".NET Framework")	A software platform developed by Microsoft for developing and executing programs that were created with different programming languages on various platforms.
SIMATIC Logon	• Assignment of the roles defined for the PCS 7 applications to the Windows users/user groups along with the corresponding administrator rights • Activation of user dialogs for the applications managed with SIMATIC Logon. • Release and logging of functions
SIMATIC PDM	Configuration, parameter assignment, commissioning and diagnostics of intelligent process devices. SIMATIC PDM allows a number of process devices to be configured under one common user interface.
WebNavigator Remote Publisher	For remote publishing of images and other relevant data for a PCS 7 Web server.

Add-ons on own installation media

These applications are not part of the Process Control System; SIMATIC PCS 7 DVD.

Applications	Brief description
S7-F Systems	For configuring fail-safe functions of a SIMATIC S7-400F / SIMATIC S7-400FH. The application automatically supplements CFC plans defined by the user, adding functions for error detection and fault reaction and offers supportive functions, such as comparing or removing F programs.

Additional information

For information about the software packages and how to use them, please refer to the brief description *SIMATIC PCS 7 process control system* or the catalog *ST PCS 7*.

5.2 Appendix B - Approved configurations on a PC station

5.2.1 Approved configurations

Introduction

You can use a PC station for PCS 7 not only in the standard configuration. By installing additional program packages or taking advantage of special properties, you can use a PC station for several purposes, for example:

- as an engineering station with BATCH client installation (Configurations with engineering station, clients and single station system (Page 158))
- as an OS server and operator station (client installation on server (Page 160))
- as an OS server and BATCH server (server on server (Page 159))

Standard configurations

The following program packages are offered in the PCS 7 system setup when a PC station is installed:

- Engineering
 - For an engineering PC
PCS 7 Engineering, BATCH Engineering, Route Control Engineering, PDM

or

- Runtime (process mode)
 - For a single station PC
OS Single Station, BATCH Single Station, Route Control Single Station
 - For a server PC:
OS Server, OS Server for BATCH, OS Server for Route Control, OS Server for BATCH and Route Control, Maintenance Station, Central Archive Server, BATCH Server, Route Control Server
 - For a client PC:
OS Client, OS Client for BATCH, OS Client for Route Control, OS Client for BATCH and Route Control, BATCH Client, Route Control Client
 - For a PC for archiving, log management, reporting and report creation
Process Historian, Information Server
 - For an OpenPCS 7 (OPC) PC:
OpenPCS 7, OS Client with OpenPCS 7
 - For a PC for Web stations:
PCS 7 Web Server, PCS 7 Web Client, PCS 7 Diagnostics Client, DataMonitor Server, DataMonitor Client

Notes for the reader on this section

Note

In this section the activation of a standard configuration refers to the activation of an application, for example, activation of a BATCH client's process mode.

Optimum performance

To ensure that PCS 7 performs at its optimum level, we recommend that you use only standard configurations on a PC station. However, system-specific conditions may mean that you have to equip a PC station with several program packages for standard configurations. If this is the case, you must observe the rules described below.

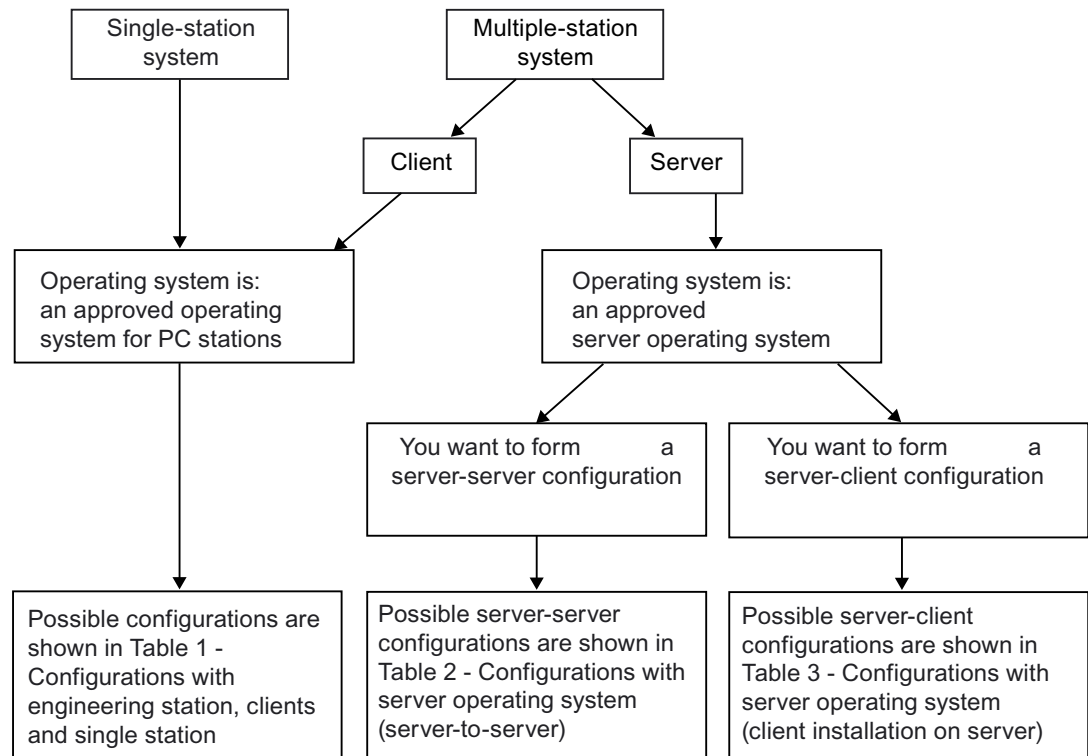
Rules

Concerns	Rules
PCS 7 project	Only use the PC configurations described here within a PCS 7 project.
Program packages	Several program packages may be installed on a PC station. However, these stations may only be used simultaneously in exceptional cases (see the configuration tables below).
Performance	Activating several PCS 7 program packages will impair the performance of the individual applications.

Concerns	Rules	
Configuring the PC station	More powerful equipment may be required for the PC configurations described here (for example, larger work memory, operating system). You can find information about the minimum performance requirements of the individual standard configurations in the catalog <i>ST PCS 7</i> .	
Using the PC station (installation)	You can activate the properties of several standard configurations on a PC station if: • Other program packages have been installed in addition to the standard configuration (for example, BATCH client on engineering station) or • You activate special properties of the standard configuration (for example, OS workstation on OS server).	
Number of monitors on a PC station	If you use a server as a workstation also, you can connect a maximum of five workstations (monitors) to that server (workstation on server + workstations on assigned clients).	
Maintenance Station	The Maintenance Station can be configured as a single station or multiple-station system. You can configure the MS server with PCS 7 servers on a PC station, in accordance with Table 2 below. An ES or OS client can be used as an MS client.	
External archive server	Process Historian (Information Server)	The Information Server can be installed on a Process Historian.
	Information Server	The Information Server can be installed on an OS server.
	Central archive server	The Central Archive Server should always be installed on a separate PC station. The PC station can be configured redundantly
OpenPCS 7	OpenPCS 7 can be installed on the following PC stations: • Separate PC station • OS client • OS server • OS Single-user system • Central Archive Server (CAS; also redundant)	
Configurations with several servers	In the interests of maintaining performance levels, you must not use more than two server applications on a PC station.	
Starting and stopping a PCS 7 server application on redundant servers with several PCS 7 server applications	If several PCS 7 server applications are active in process mode on one server of a pair (for example, BATCH server and Route Control server), we recommend the following: Make sure that you always start or stop all of a server's PCS 7 server applications. This will allow you to avoid faults should a redundant server fail. Note: Should a PCS 7 server application on a PC of a PCS 7 server pair fail, all PCS 7 applications for this PC's process mode will be terminated automatically.	

Approved configurations - PC station for several PCS 7 applications

The tables below show the approved configurations of PC stations for several PCS 7 applications. The flow chart below displays how the configurations are assigned to the operating systems:



Example configuration:

Example configuration for a redundant small system with five workstations:

- 1 PC = 1 engineering station = 1 workstation
- + 2 PCs = 1 redundant OS server = 2 workstations
- + 2 PCs = 1 redundant BATCH server = 2 workstations

Note

Each workstation can be designed as an OS client and/or a BATCH client.

Notes for the reader on the tables below

Note

Read Tables 1 - 3 carefully from left to right. This means that a PC with a standard installation can also be used for an additional purpose (by using properties or an additional installation by means of the PCS 7 system setup).

Example:

If you also use a PC station with the standard configuration "engineering station" as an "OS single station system", the notes and restrictions defined under "A" (configuration type "A") will apply.

Notes and restrictions:

You can find information on this in the following sections:

- Section "Information on configuration type "X" (Page 161)"
- Section "Information on configuration type "-" (Page 161)"
- Section "Information on configuration type "A" (Page 161)"
- Section "Information on configuration type "B" (Page 161)"

5.2.2 Configuration tables

5.2.2.1 Configurations with engineering station, clients and single station system

Table 1 – Configurations with Engineering Station, Clients and Single Station System

Purpose	Engineering station	OS single-station system	OS client	BATCH single station system	BATCH client	Route Control single station system	Route Control Client
Standard configuration							
Engineering station		A (Page 161)	B (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)
OS single-station system	--- (Page 161)		--- (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)
OS client	--- (Page 161)	--- (Page 161)		X (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)
BATCH single station system	--- (Page 161)	X (Page 161)	X (Page 161)		--- (Page 161)	X (Page 161)	--- (Page 161)
BATCH Client	--- (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)		--- (Page 161)	X (Page 161)

5.2 Appendix B - Approved configurations on a PC station

Purpose	Engineering station	OS single-station system	OS client	BATCH single station system	BATCH client	Route Control single station system	Route Control Client
Standard configuration							
Route Control single station system	--- (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	--- (Page 161)		--- (Page 161)
Route Control Client	--- (Page 161)	--- (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	--- (Page 161)	

5.2.2.2 Configurations with server operating system (server to server)

Table 2 - Configurations with server operating system (server to server)

Purpose	OS server	Redundant OS server	Maintenance server	Redundant maintenance server	BATCH server	Redundant BATCH server	Route control server	Redundant Route Control server
Standard configuration								
OS server			X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)
Redundant OS server			--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)
Maintenance server	X (Page 161)	--- (Page 161)			X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)
Redundant maintenance server	--- (Page 161)	X (Page 161)			--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)
BATCH server	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)			X (Page 161)	--- (Page 161)
Redundant BATCH server	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)			--- (Page 161)	X (Page 161)
Route Control server	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)		
Redundant Route Control server	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)		

Central Archive Server, Process Historian and Information Server

- Process Historian (Information Server)
The Information Server can be installed on a Process Historian.
- Central archive server
The central archive server should always be installed on a separate PC station.
The PC station can be configured redundantly.

5.2.2.3 Configurations with server operating system (client installation on server)**Table 3 - Configurations with server operating system (client installation on server)**

Purpose	Engineering station	OS single-station system	OS client	BATCH single station system	BATCH client	Route Control single station system	Route Control Client
Standard configuration							
OS server	--- (Page 161)	--- (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)
Redundant OS server	--- (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)
Maintenance server	--- (Page 161)	--- (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)
Redundant maintenance server	--- (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)
BATCH Server	--- (Page 161)	X (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)
Redundant BATCH server	--- (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)
Route Control server	--- (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)
Redundant Route Control server	--- (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)	--- (Page 161)	X (Page 161)

5.2.3 Information on configurations

5.2.3.1 Information on configuration type "X"

No restrictions

Read the configuration notes for the respective standard configurations.

5.2.3.2 Information on configuration type "-"

Restriction

This configuration is not approved.

5.2.3.3 Information on configuration type "A"

Restriction

If process mode is activated for an OS on the ES, simultaneous OS engineering can only be performed for this activated OS.

5.2.3.4 Information on configuration type "B"

Restrictions

- No additional installation of an OS client is necessary since the OS workstation is already included in the standard configuration "Engineering Station".
- A PC station cannot be concurrently used as an engineering station and an OS client. During configuration the process mode of the OS client must be terminated and vice versa.

Notes re configuration

- You need to configure a separate OS client in the SIMATIC manager for this OS workstation.
- You cannot and do not have to load the OS client project.

Notes re process mode

- The SIMATIC manager must be closed when the client project is opened. Otherwise the OS client takes its server data from the engineering station!
- Activate the OS client:
 1. Open WinCC Explorer.
 2. Select OS client project.
 3. Activate process mode.

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