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**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
We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.
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Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens’ products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

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To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit http://support.automation.siemens.com.
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

You can find the PCS 7 documentation at the following locations:

● On the Process Control System; SIMATIC PCS 7 DVD
● After installation, on the computer
● On the Internet

Full versions of the documentation are available on the Internet pages of the "SIMATIC PCS 7 Technical Documentation": www.siemens.de/pcs7-dokumentation (www.siemens.com/pcs7-documentation)

Note

PCS 7 Readme (Internet version)

The information provided in the PCS 7 Readme on the Internet takes precedence over all PCS 7 documentation.

Please read this PCS 7 Readme carefully; it contains important information and amendments on PCS 7.
Documentation for PCS 7 on the Process Control System; SIMATIC PCS 7 DVD
• PCS 7 Readme (DVD version)
The PCS 7 Readme on the Process Control System; SIMATIC PCS 7 DVD contains important information about PCS 7 and takes precedence over the PCS 7 documentation supplied with the product. After installation of PCS 7, you will find the document Process Control System PCS 7; PCS 7 Readme in the Windows Start menu using the following path:
Siemens Automation > SIMATIC > Product Notes > <language>
• You can find the most important PCS 7 system documentation at the following locations:
  – On the SIMATIC PCS 7 DVD in the "Manuals" folder
  – On the engineering station as online help (CHM file) for the SIMATIC Manager application
  – On the engineering station as a PDF file in the Windows Start menu using the following path:
    Siemens Automation > SIMATIC > Documentation > <language>

Note
The following PCS 7 system documentation is included:
• Product overview Process Control System PCS 7; PCS 7 Documentation
• Configuration manual Process Control System PCS 7; Engineering System
• Function manual Process Control System PCS 7; PCS 7 - PC Configuration
• Configuration manual Process Control System PCS 7; Operator Station
• Function manual Process Control System PCS 7; OS Process Control

• The product documentation is installed with the relevant product.
Documentation for PCS 7 on the Internet (current versions)

The latest documentation on the PCS 7 versions is available on the Internet page "Technical Documentation SIMATIC PCS 7":

- In the section "Software manuals for SIMATIC PCS 7 ..."
  - The link to the latest system and product documentation of the particular PCS 7 version.
  - The link to download the Setup for the latest system documentation "PCS 7 Documentation Portal Setup".

Note

PCS 7 Documentation Portal Setup

Setup includes the complete system documentation for PCS 7 (PDF files and online help).

- You can install this Setup without PCS 7.
- The following documentation is updated when you install the Setup on the engineering station (completed and overwritten - if you select the original installation folder):
  - Online help of the "SIMATIC Manager" application: (CHM files)
  - System documentation for PCS 7 in the Windows Start menu: Siemens Automation > SIMATIC > Documentation > language > PDF files
- The PCS 7 Newsletter keeps you informed when new versions of the system documentation become available.

- The link to download the entire PCS 7 documentation as a Manual Collection in the My Documentation Manager (http://support.industry.siemens.com/my/ww/en/documentation/advanced/).
  The Manual Collection includes the manuals for hardware and software.

- In the section "Hardware Manuals for SIMATIC PCS 7 ..."
  - The link to the latest manuals for components approved for a PCS 7 version.
  - The link to the latest manuals for approved SIMATIC PCS 7 industry software for PCS 7.

Catalogs, brochures, customer magazines and demo software

This information is available on the Internet at: Information and Download Center (http://www.automation.siemens.com/mcms/infocenter)

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:

- Adaptation of the Windows operating systems
- The Process Historian is the external archive server
3.1 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

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<tr>
<th>Station</th>
<th>Function</th>
</tr>
</thead>
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<td>Engineering station</td>
<td>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.</td>
</tr>
<tr>
<td>Operator station</td>
<td>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.</td>
</tr>
<tr>
<td>Maintenance station</td>
<td>The maintenance station is based on an operator station (OS). This OS focuses on &quot;Plant Asset Management&quot; 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.</td>
</tr>
<tr>
<td>BATCH station</td>
<td>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. BATCH stations are PCs on which the SIMATIC BATCH software is installed.</td>
</tr>
<tr>
<td>Route Control station</td>
<td>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. Route Control stations are PCs on which the SIMATIC Route Control software is installed.</td>
</tr>
</tbody>
</table>
| Bus system (terminal bus and plant bus) | 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                | 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. |
3.2 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:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction to server failure</td>
<td>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.</td>
</tr>
<tr>
<td>Behavior from the client perspective</td>
<td>From a client perspective, a redundant server pair behaves like one server.</td>
</tr>
<tr>
<td>Configuration</td>
<td>You configure all of the configuration data for one server only. You then download the configuration data to both redundant servers.</td>
</tr>
<tr>
<td>Configuration limits</td>
<td>A redundant server pair behaves like one server. You can find additional information on this in the section &quot;Differences between multiple station systems and single station systems (Page 17)&quot;.</td>
</tr>
</tbody>
</table>

- Note the following properties for redundant network components:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response to cable failure (disruption in a ring line)</td>
<td>The typical networks in a ring structure in PCS 7 feature cable redundancy. The network remains in operation even if one cable fails.</td>
</tr>
<tr>
<td>Response to failure of network adapters of PCs or switches</td>
<td>If you use redundant network adapters and redundant network connections, the network remains in operation even when a network adapter or switch fails.</td>
</tr>
</tbody>
</table>
### 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 17)" section.
- You can find information on how to activate redundancy in the "Configuring redundancy for redundant servers (Page 82)" 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*.

### 3.3 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.

<table>
<thead>
<tr>
<th>Property</th>
<th>Working with multiple engineering stations</th>
<th>Working with a single engineering station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of application</td>
<td>● Medium-sized and large systems&lt;br&gt;● Configuration phases&lt;br&gt;● Spatially distributed configuration of engineering stations</td>
<td>● Small systems&lt;br&gt;● Local operator stations&lt;br&gt;● Training systems</td>
</tr>
<tr>
<td>Monitors</td>
<td>1 or 2 recommended</td>
<td>Engineering of a PCS 7 project on a single PC (Page 21)&lt;br&gt;Combination of engineering station and operator station on a single PC (Page 21)&lt;br&gt;Engineering with SIMATIC PCS 7 BOX: You will find information on this in the manual Process Control System PCS 7; SIMATIC PCS 7 BOX</td>
</tr>
</tbody>
</table>

### 3.4 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 system 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 system 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

<table>
<thead>
<tr>
<th>Property</th>
<th>Multiple station system</th>
<th>Single station system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas of application</td>
<td>Medium-sized and large systems</td>
<td>Small systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local operator stations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Training systems</td>
</tr>
<tr>
<td>Configuration</td>
<td>Client-server architecture with multiple PCs:</td>
<td>One PC for all functions of a PCS 7 application:</td>
</tr>
<tr>
<td></td>
<td>- Operator station multiple station system</td>
<td>- OS single station system</td>
</tr>
<tr>
<td></td>
<td>(Page 22)</td>
<td>- BATCH single station system</td>
</tr>
<tr>
<td></td>
<td>- BATCH station multiple station system</td>
<td>- Route Control single station system</td>
</tr>
<tr>
<td></td>
<td>(Page 24)</td>
<td>- SIMATIC PCS 7 BOX stations</td>
</tr>
<tr>
<td></td>
<td>- Route control station multiple station system</td>
<td>- Maintenance station single station system</td>
</tr>
<tr>
<td></td>
<td>(Page 25)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Maintenance station multiple station system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Page 25)</td>
<td></td>
</tr>
<tr>
<td>Workstations</td>
<td>● Maximum number of clients that a server can supply with process data: 40</td>
<td>1 workstation with a maximum of 4 monitors (depending on the application)</td>
</tr>
<tr>
<td></td>
<td>● Maximum number of permissible monitors per server for process mode in a plant: 60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● If you operate no more than 4 clients on a server, you can use a server as an operator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>control and monitoring station.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum number of monitors that can be connected to a workstation with a multi-VGA card:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>You can operate the resulting system areas with a single keyboard and mouse.</td>
</tr>
<tr>
<td>Availability</td>
<td>To guarantee high availability of the PCS 7 plant, you can configure the server as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>redundant server pairs (PCs):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Operator station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- OS server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Archive server (Process Historian)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- MS server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- BATCH station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- BATCH server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Route Control station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Route Control server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Archive server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Process Historian</td>
<td></td>
</tr>
<tr>
<td></td>
<td>You can find additional information on this in the section &quot;Fault-tolerant (redundant)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>configurations (Page 15)&quot;.</td>
<td></td>
</tr>
<tr>
<td>Number of servers</td>
<td>Maximum number of servers or server pairs in the PCS 7 plant that can simultaneously</td>
<td></td>
</tr>
<tr>
<td></td>
<td>access a project on the OS clients: 18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The following each count as one server:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Server for multiple station systems (see configuration)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Redundant server pair (see configuration)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Archive server</td>
<td></td>
</tr>
</tbody>
</table>
**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:
3.5 Solutions for engineering stations

3.5.1 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:

<table>
<thead>
<tr>
<th>Option</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuring in a multi-project</td>
<td>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.</td>
</tr>
<tr>
<td>Branching and merging charts of a project</td>
<td>You can branch and merge the projects at the chart level (S7 program) to allow several engineers to work at the same time.</td>
</tr>
<tr>
<td>Configuring over a network</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.
3.5.2 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.

3.5.3 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.
3.6 Solutions for multiple station systems

3.6.1 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 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 a redundant OS server. You also need the "SIMATIC PCS 7 Server Redundancy" software package for redundant OS servers. For smaller plants, system configurations with multiple OS single station systems is appropriate. You can find information about this in section "OS single station system (Page 29)".

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 35)" and in the manual Process Control System PCS 7; SIMATIC PCS 7 BOX.
Example configuration

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 25)"
- 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 operator station using Internet Explorer if the following conditions are met:

- The "Web Option for OS" is installed on an OS client that is assigned to an operator station.
- The necessary access rights in the network are in place.

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

Long-term archive with Process Historian

The Process Historian is used in PCS 7 as an external server for long-term archiving of system data. You can information on this in the system manual SIMATIC; Process Historian Administration.

Additional information

- You can find information on configuration limits in the section "Differences between multiple station systems and single station systems (Page 17)".
- You can find information about long-term archiving of plant data in the section "Process Historian and Information Server (Page 27)".
- You can find information on using the OS client in a virtual operating environment on the Internet "http://support.automation.siemens.com (http://support.automation.siemens.com/WW/view/en/51401737)".
3.6.2 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.
- 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.

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 system bus.

Additional information

You can find information on configuration limits in the section "Differences between multiple station systems and single station systems (Page 17)".
3.6.3 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.
- 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.
- 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.

Example configuration

![Diagram of route control station multiple station system]

Additional information

You can find information on configuration limits in the section "Differences between multiple station systems and single station systems (Page 17)."

3.6.4 Maintenance station multiple station system

Introduction

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

![Example configuration diagram](image)

### 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 78)".
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 144)"
- *Process Control System PCS 7; Maintenance Station Manual*

### 3.6.5 External archive servers and reporting system

#### 3.6.5.1 Process Historian and Information Server

The Process Historian is used in PCS 7 as an external server for long-term archiving of system data.

The Information Server is used in PCS 7 as a reporting system for plant data that are archived on the Process Historian.

**Overview of Process Historian and Information Server**

<table>
<thead>
<tr>
<th>Function</th>
<th>Process Historian</th>
<th>Information Server</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Saving data</strong></td>
<td>Central long-term archiving system</td>
<td>Central system for creating and distributing reports based on the data stored in the Process Historian</td>
</tr>
<tr>
<td>• Messages and process values</td>
<td>Archiving</td>
<td></td>
</tr>
<tr>
<td>• OS reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• BATCH reports</td>
<td>Archiving</td>
<td></td>
</tr>
<tr>
<td><strong>Displaying data</strong></td>
<td>possible at any time</td>
<td>possible at any time</td>
</tr>
<tr>
<td>• Visualize messages and process values via filter functions</td>
<td>possible</td>
<td></td>
</tr>
<tr>
<td>• Showing BATCH reports</td>
<td>Report as PDF file</td>
<td></td>
</tr>
</tbody>
</table>
### Process Historian

<table>
<thead>
<tr>
<th>Process Historian</th>
<th>Information Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtering BATCH data</td>
<td>Using SQL functions</td>
</tr>
<tr>
<td>Saving archive data to external media</td>
<td>manual and automatic saving possible</td>
</tr>
</tbody>
</table>

### Exporting process values

<table>
<thead>
<tr>
<th>Process Historian</th>
<th>Information Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>via WinCC controls</td>
<td>CSV file, XML file</td>
</tr>
<tr>
<td>Report formats</td>
<td>PDF file, RTF file, DOCX file, XLSX file</td>
</tr>
</tbody>
</table>

### Importing process values

<table>
<thead>
<tr>
<th>Process Historian</th>
<th>Information Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import add-in for Excel on any computer</td>
<td>possible, as the IS is a Web server</td>
</tr>
</tbody>
</table>

### Displaying archive data via the Web

<table>
<thead>
<tr>
<th>Process Historian</th>
<th>Information Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>possible</td>
<td>possible</td>
</tr>
</tbody>
</table>

### Redundant configuration

<table>
<thead>
<tr>
<th>Process Historian</th>
<th>Information Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>possible</td>
<td></td>
</tr>
</tbody>
</table>

### Note

**Installation of the Process Historian**

Note the following points during installation:

- Install the Process Historian on a separate PC to ensure the best performance.
- We recommend a RAID system for data security.

The Process Historian is a node on the terminal bus and is not connected to the system bus.

**Installation of the Information Server**

The Information Server can be installed on the following PC stations:

- On a separate PC
- On a Process Historian

### Access protection

You can configure access protection with user-specific rights on the Process Historian.

### Additional information

Process Historian and Information Server

- Documentation *SIMATIC HMI; SIMATIC Process Historian*
- Documentation *SIMATIC HMI; SIMATIC Information Server*
3.6.5.2 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
- Transfer archive data to external storage media

Functions of the Information Server
- Integration and creation of reports from Office products (Excel, Word, PDF)
- Display archive data of a batch
- Web-based display and generation of reports

Additional information
- Documentation SIMATIC; Process Historian
- Documentation SIMATIC; Information Server

3.7 Solutions for single station systems

3.7.1 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 system 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 21)".

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:

- 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-spanning 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)”. 

Long-term archive with Process Historian

The Process Historian is used in PCS 7 as an external server for long-term archiving of system data. You can find information on this in the system manual SIMATIC; Process Historian Administration.

Additional information

- Section "Combination of engineering station and operator station on a single PC (Page 21)"
- Function manual Process Control System PCS 7; SIMATIC PCS 7 BOX

3.7.2 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 24).
- 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.
3.7.3 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.
3.7 Solutions for single station systems

Example configuration

3.7.4 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 25)"
- Section "OS single-station system (Page 29)"
- Section "Combination of Engineering Station and Operator Station on a Single PC (Page 21)"
- Appendix "Approved Configurations (Page 144)"
- *Process Control System PCS 7; Maintenance Station Manual*
- Manual *Process Control System PCS 7; SIMATIC PCS 7 BOX*
3.7.5 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:

<table>
<thead>
<tr>
<th>Product name</th>
<th>Variant</th>
<th>AS selection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC PCS 7 BOX RTX</td>
<td>PC station with integrated AS</td>
<td>Integrated: Software CPU (WinAC RTX)</td>
<td>SIMATIC PCS 7 BOX RTX enables ES/OS or OS operation. WinAC RTX 2010 supports up to 2000 AS process objects (PO).</td>
</tr>
<tr>
<td>SIMATIC PCS 7 BOX RTX</td>
<td>PC station with external AS</td>
<td>PCS 7 AS mEC RTX (AS im S7-300 Design / SIMATIC S7-mEC)</td>
<td>SIMATIC PCS 7 BOX enables ES/OS or OS operation. WinAC RTX 2010 supports up to 2000 AS process objects (PO).</td>
</tr>
<tr>
<td>SIMATIC PCS 7 BOX RTX</td>
<td>Only PC station</td>
<td>No AS</td>
<td>SIMATIC PCS 7 BOX enables ES/OS or OS operation.</td>
</tr>
</tbody>
</table>

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.
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 the basic structure for an AS based on PCS 7 AS mEC RTX.

![Example configuration diagram]

Licenses

You can find information on licenses for the components of the process control system and possible plant sizes in the installation manual *Process Control System PCS 7; Licenses and Configuration Limits.*

Additional information

- Manual *Process Control System PCS 7; SIMATIC PCS 7 BOX*
- Catalog *ST PCS 7*
3.8 Solutions for accessing PC stations

3.8.1 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*
3.8.2 Remote access via terminal services

Using the Web option for OS

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.

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.
3.8.3 Access to PCS 7 data using OpenPCS 7

Accessing PCS 7 data with OPC and OLE/DB

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)

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 UA (Unified Architecture)
- 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))

Additional information

Process Control System PCS 7; OpenPCS 7 manual

3.9 Connecting PC stations

3.9.1 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
- System bus
You can find additional information on this in the section "Differences between multiple station systems and single station systems (Page 17)".

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 21)".

**Example configuration**

![Diagram of example configuration]

**Topology**

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

- As Industrial Ethernet (10/100/1000 Mbps)
- 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

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

- System bus

### Data communication

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

### Shared system/terminal bus

When using PCS 7 for process engineering plants, we recommend you separate the terminal bus and system bus. This recommendation is based on the most stringent requirements for availability and robustness of these plants.

---

**Note**

**Connection**

Nodes must always be connected with two separate network adapters or communications processors even when using a shared bus.
Advantages and disadvantages

- **Advantage:**
  Cost reduction can only be achieved in cabling overhead because otherwise the connection of the communication nodes in the network is no different from the recommended configuration with separate system bus and terminal bus.

- **Disadvantage:**
  A shared bus is at a disadvantage with regard to access and error security. For example, a targeted attack or a device error not only disturbs communication between OS servers and OS operating stations at the terminal bus end, but also the communication on the system bus and ultimately will lead to failure of the entire automation. These security-related aspects need to be compared and weighed against the corresponding requirements in the respective project.

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 13)"
- Section "Components for connection to the terminal bus/plant bus (Page 48)"
- You can find general information about the configuration limits in PCS 7 in the installation manual *Process Control System PCS 7; Licenses and Configuration Limits.*

### 3.9.2 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 48)."
Example configuration

![Diagram of a PC station connected to an automation system via Industrial Ethernet]

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.
3.9.3 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 129)" section.

Components for WLAN in PCS 7

The product overview in Process Control System PCS 7; Released Modules lists the network and PC components for WLAN that are approved in PCS 7. After installing PCS 7, you can find the Process Control System PCS 7; Released Modules product overview in the SIEMENS SIMATIC documentation folder of the Start menu.

Example for WLAN in PCS 7

The following figure shows 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 overview *Process Control System PCS 7; PCS 7 Released Modules*)
- System manual *SIMATIC NET; Basics - Industrial Wireless LAN*

3.9.4 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:

<table>
<thead>
<tr>
<th>Station</th>
<th>Synchronization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator station and maintenance station</td>
<td>PCS 7 internal synchronization</td>
</tr>
<tr>
<td></td>
<td>The time master can be on one of the following networks:</td>
</tr>
<tr>
<td></td>
<td>• On the terminal bus</td>
</tr>
<tr>
<td></td>
<td>• On the plant bus</td>
</tr>
<tr>
<td>BATCH station</td>
<td>In the case of installation without OS, no synchronization via PCS 7.</td>
</tr>
<tr>
<td>Route Control station</td>
<td>You have the following options for synchronization, for example:</td>
</tr>
<tr>
<td></td>
<td>• Synchronization via DCF77-client</td>
</tr>
<tr>
<td></td>
<td>• Synchronization via the domain controller as the time master on the terminal bus</td>
</tr>
<tr>
<td>SIMATIC PCS 7 BOX</td>
<td>PCS 7 internal synchronization is possible. The method used depends on the product variant (Page 35) (operator station or AS)</td>
</tr>
<tr>
<td>AS</td>
<td>• Synchronization via the plant bus</td>
</tr>
</tbody>
</table>
### Additional information

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

<table>
<thead>
<tr>
<th>Station</th>
<th>Synchronization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain</td>
<td>● Synchronization via the domain controller as the time master on the terminal bus</td>
</tr>
<tr>
<td>Time master</td>
<td>● The time master is integrated in a PC or connected to the Ethernet network as a bus component.</td>
</tr>
<tr>
<td></td>
<td>● The time master can be any device which can transmit a time signal via the Ethernet network Additional information (a PC, for example).</td>
</tr>
</tbody>
</table>
4.1 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 48)" 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. The firewall of the operating system is deactivated by default.

If you enter these PCs 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 74)" section.

Additional information

- Catalog ST PCS 7
- Catalog ST PCS 7 AO (add-ons for SIMATIC PCS 7)
4.2 Basic hardware configuration

Information in the readme file

Read the latest information that accompanies each PCS 7 version in the document Process Control System PCS 7; PCS 7 Readme.

You can find information about this function in the section "Preface (Page 9)".

Additional information

- Catalog ST PCS 7
- Catalog ST PCS 7 AO (add-ons for SIMATIC PCS 7)

4.3 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 additional information on this in the Process Control System PCS 7; PCS 7 Readme file (see "Preface (Page 9)").

Connection to the terminal bus

For connection to the terminal bus:

- Released communication modules for the PC station (for example, Intel® Gigabit CT Desktop Adapter; Ethernet onboard interface)
- Versions for the redundant connection of the PC station to a terminal bus:
  - Parallel Redundancy Protocol
  - INTEL Team Mode

You can find information on this in the function manual Process Control System PCS 7; Fault-tolerant Process Control Systems.
Use the product documentation to verify that the communication modules are suitable for the terminal bus when implementing the respective concept.

**Connecting to the system bus**

You can use the following network adapters to connect to the system bus:

- **Standard communication modules:**
  - If you connect up to 8 communication partners per PC station (automation systems or servers).
  - If fault-tolerant automation systems are used with CPUs (firmware version as of V6.0).
- **Communication modules with onboard processors (CP 16xx) are required in the following cases:**
  - If you connect between 9 and a maximum of 64 communication partners per PC station (automation systems or servers).
  - If fault-tolerant automation systems are used with CPUs (firmware version earlier than V6.0).
  - If you require connections between a PC station with 2 network adapters to fault-tolerant automation systems.

**Licensing of the network adapter**

- **Licensing for fault-tolerant automation systems**
  You can find more information on this in the function manual *Process Control System PCS 7; Fault-Tolerant Process Control Systems*.

- **Licensing for the configured terminal bus**
  If you use a CP 16xx on the system bus and configure the terminal bus in NetPro, you will require a BCE license.

**Firewall on the system bus**

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

**Driver**

You can find information on the availability of the drivers in the *PCS 7 Readme*. 
Time synchronization

The communications processors of type CP 16xx support time synchronization on Industrial Ethernet (Fast Ethernet). A PC with communications processors can receive time frames from the following time transmitters:

- Master clock (SIMATIC SICLOCK TC 400 recommended)
- SIMATIC NET time transmitters for Industrial Ethernet
  For additional information see catalog *IK PI*
- PC with CP 16xx

Additional information

- You can find approved network adapters in the catalog overview *Process Control System PCS 7; Released Modules*
- You can find information on fault-tolerant automation systems in the function manual *Process Control System PCS 7; Fault-Tolerant Process Control Systems*.
- You can find information about time synchronization in the function manual *Process Control System PCS 7; Time synchronization*.

See also

Tasks of terminal bus and plant bus (Page 39)

4.4 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 chip cards required).

### Overview

<table>
<thead>
<tr>
<th>Component</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip card reader</td>
<td>This is used to access the PC stations via chip cards. All authorized users need a chip card.</td>
</tr>
<tr>
<td>Printer</td>
<td>Use a graphics-enabled printer or a line printer for message sequence reports. Printers must be supported by the operating system.</td>
</tr>
</tbody>
</table>
Component | Application
--- | ---
**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** | 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 96)"

---

### 4.5 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).
5 Installing PC stations

5.1 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 PCS 7 will make on the PC station.

You can find information on this in the "Notes on installing PCS 7 (Page 74)" section.

Overview of the individual steps for installation
This overview shows the recommended sequence of installation tasks.

<table>
<thead>
<tr>
<th>Step</th>
<th>What?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Installation of the operating system</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Installing the operating system (Page 64)</td>
</tr>
<tr>
<td>2</td>
<td>Installing operating system service packs (Page 69)</td>
</tr>
<tr>
<td>3</td>
<td>Setting the location where the swap file is to be stored (Page 70)</td>
</tr>
<tr>
<td>4</td>
<td>Making system settings (Page 71)</td>
</tr>
<tr>
<td>5</td>
<td>Installing the Message Queuing Service (Page 65)</td>
</tr>
<tr>
<td>6</td>
<td>Installing additional components (Page 72)</td>
</tr>
<tr>
<td>7</td>
<td>Installing the Internet Information Service (IIS) (Page 67)</td>
</tr>
<tr>
<td>8</td>
<td>Installing additional services for SIMATIC BATCH (Page 72)</td>
</tr>
<tr>
<td>9</td>
<td>Setting the color scheme and font size (Page 71)</td>
</tr>
<tr>
<td>10</td>
<td>Creating a backup (Page 73)</td>
</tr>
<tr>
<td><strong>Installation of PCS 7</strong></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Installing the PCS 7 software (Page 78)</td>
</tr>
<tr>
<td>12</td>
<td>Installing the central archive server (Process Historian) (Page 82)</td>
</tr>
<tr>
<td>13</td>
<td>Configuring the redundancy for redundant servers (Page 82)</td>
</tr>
<tr>
<td>14</td>
<td>Installing a PC for PCS 7 OS Web Option (Page 83)</td>
</tr>
<tr>
<td>15</td>
<td>Activating the firewall in PC stations (Page 89)</td>
</tr>
<tr>
<td>16</td>
<td>Installing additional communication modules and PCS 7-specific settings (Page 91)</td>
</tr>
<tr>
<td>17</td>
<td>Licensing the PCS 7 software (Page 100)</td>
</tr>
</tbody>
</table>
## 5.2 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

<table>
<thead>
<tr>
<th></th>
<th>Domain (AD; Active Directory)</th>
<th>Workgroup (WG)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General information (in relation to Microsoft Windows)</strong></td>
<td>The user information is stored centrally.</td>
<td>Standard user settings are required at each PC station.</td>
</tr>
<tr>
<td></td>
<td>Central safety database</td>
<td>Local safety database</td>
</tr>
<tr>
<td></td>
<td>Suitable for very large networks (scalability)</td>
<td>Suitable for short distances in the plant and a limited number of PC stations.</td>
</tr>
<tr>
<td></td>
<td>Authorizations for devices and files are managed in the AD.</td>
<td>Authorizations for devices and files are managed by individual PC stations.</td>
</tr>
<tr>
<td><strong>Administrator</strong></td>
<td>The administrator must have comprehensive knowledge (substantially higher qualifications).</td>
<td>The administrator must be familiar with the set-up and management of PC stations in the workgroup network.</td>
</tr>
<tr>
<td><strong>User accounts, group policies, resources, security</strong></td>
<td>Central administration in the AD.</td>
<td>Distributed administration on each PC station.</td>
</tr>
<tr>
<td><strong>Planning</strong></td>
<td>Comprehensive planning is required.</td>
<td>Less comprehensive planning is required.</td>
</tr>
<tr>
<td><strong>Number of PC stations</strong></td>
<td>Additional PC stations required to manage the AD. Windows server required to store central security information.</td>
<td>Windows server only required if this is used to set up the infrastructure, for example, as a DHCP server</td>
</tr>
</tbody>
</table>
| **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. |
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.

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.

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

<table>
<thead>
<tr>
<th>Scenarios (examples)</th>
<th>Domain (AD; Active Directory)</th>
<th>Workgroup (WG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New user is added.</td>
<td>The new user is created centrally in the AD and is then available immediately on all PC stations.</td>
<td>The new user must be added on each PC station.</td>
</tr>
<tr>
<td>User password is changed.</td>
<td>The password is changed centrally in the AD.</td>
<td>The password must be changed on each PC station.</td>
</tr>
<tr>
<td>Add or replace computer</td>
<td>The settings are applied automatically in accordance with the group policies of the corresponding organizational unit.</td>
<td>The settings must be adapted locally on the PC station.</td>
</tr>
<tr>
<td>Modify security settings</td>
<td>The settings are changed centrally in the AD and distributed by means of group policies.</td>
<td>All settings must be changed locally.</td>
</tr>
<tr>
<td>Microsoft Updates are to be distributed.</td>
<td>The settings for the Microsoft Windows Software Update Service (WSUS) are made centrally in the domain.</td>
<td>The settings for the Microsoft Windows Software Update Service (WSUS) are made at each PC station.</td>
</tr>
</tbody>
</table>
### Scenarios (examples)

<table>
<thead>
<tr>
<th>Devices are added (e.g. printer, fax or scanner).</th>
<th>Domain (AD; Active Directory)</th>
<th>Workgroup (WG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The devices are announced by AD.</td>
<td>The devices are announced by AD.</td>
<td>Devices not announced. The information for connecting to the device must be known.</td>
</tr>
<tr>
<td>The security settings can be made centrally for each device.</td>
<td>The security settings can be made centrally for each device.</td>
<td>Each user that uses the device must be created locally at this PC station and log on with local user information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>One user uses multiple computers.</th>
<th>The user profile can be saved centrally. This applies the settings to all PC stations at logon.</th>
<th>The user has a local profile on each PC station.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If the profile is not saved centrally, every user will have their own local profile.</td>
<td></td>
</tr>
</tbody>
</table>

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.

### Setting package size for communication (MTU size)

As of PCS 7 V8.1 SP1, the MTU (maximum transmission unit) size must be set for all computers located in the PCS 7 plant.

- Setup makes the necessary settings on computers with installed PCS 7 components.
- The MTU size has to be set to 1494 bytes for all components without a PCS 7 installation. This can be done on computers without a PCS 7 installation (e.g. domain controller and file server) or network components based on Windows (e.g. Automation Firewall) using the tool "set_mtu_size_to_1494.exe".
  - You can find the "set_mtu_size_to_1494.exe" tool on the PCS 7 DVD 2 in the folder Additional_Products > MTU. Documentation on the tool can be found in the same folder.
  - An administrator must execute this file on all computers on which no PCS 7 components are installed.

### Additional information

- Section "PC configuration security settings (Page 62)"
- You can find additional information on the Internet: www.siemens.com/pcs7-documentation (www.siemens.de/pcs7-documentation)
  You can find the following manuals via the link:
  - 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
5.3 Installing the operating system

5.3.1 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 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 Process control system PCS 7; PCS 7 Readme file (see "Preface (Page 9)"). Below you will find the most important information and settings for installing operating systems approved for PCS 7.

You can find information on this in the installation manual 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.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Important information</strong></td>
</tr>
<tr>
<td>Please note the following:</td>
</tr>
<tr>
<td>● 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.</td>
</tr>
<tr>
<td>● Check the suitability of your hardware before performing a new installation. Additional information on this is also available in the <em>Process Control System PCS 7; PCS 7 Readme</em> file (see “Preface (Page 9)”).</td>
</tr>
<tr>
<td>● Back up your licenses (authorizations and license keys).</td>
</tr>
<tr>
<td>● 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 <em>Process Control System PCS 7; Service Support and Diagnostics</em>.</td>
</tr>
<tr>
<td>● Make the preparations for updating the software. You can find additional information about this in the manuals <em>Process Control System PCS 7; Software Update</em>.</td>
</tr>
<tr>
<td>● Back up the data required for the software update.</td>
</tr>
<tr>
<td>● Format the hard disks and create new partitions.</td>
</tr>
</tbody>
</table>

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)”.

---

*Installing PC stations*

5.3 Installing the operating system

PCS 7 - PC Configuration (V8.1 SP1)
Installation Manual, 03/2015, A5E32785541-AD
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**

The "SIMATIC PCS 7 Vx.x Asia" USB hardlock 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.

---

**5.3.2 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:

<table>
<thead>
<tr>
<th>Drive letter</th>
<th>Size in GB</th>
<th>Drive name</th>
<th>Formatting</th>
<th>Intended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>C:</td>
<td>100</td>
<td>SYSTEM</td>
<td>NTFS</td>
<td>Operating system installation and PCS 7 installation</td>
</tr>
<tr>
<td>D:</td>
<td>x</td>
<td>DATA</td>
<td>NTFS</td>
<td>PCS 7 project data</td>
</tr>
</tbody>
</table>

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 | NTFS       | Backup files of the PC station                   |

Additional information
You can find information about the minimum configuration of the basic hardware in the Process Control System PCS 7; PCS 7 - Readme file (see “Preface (Page 9)”).

5.3.3 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.

5.3.4 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.

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.

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.

You can find information about protecting data exchange between the operator stations in the following sections:

- Section "How to configure encrypted communication between the PC stations (Page 118)"
- Section "How to set up the connection between the PC station and plant bus (Page 111)"

Virus scanners and updates

Important information on the following topics is available in the *Process Control System PCS 7: PCS 7 Readme* file (see "Preface (Page 9)"):

- **Virus scanners**
  You can find additional information on this in the section "How to install additional components (Page 72)".

- **Updates**
  You can find additional information on this in the section "Installing security patches, hotfixes, service packs (Page 123)".
5.3 Installing the operating system

Additional information

- Section "Notes on installing the operating system (Page 57)"
- You can find additional information about the security settings in the following section:
  - Section "Installing security patches, hotfixes, service packs (Page 123)"
- Document Security concept PCS 7 and WinCC - Basic Document
- Process Control System PCS 7; PCS 7 Readme file (see "Preface (Page 9)"

5.3.5 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 information on this in the "Hard disk partitioning (Page 60)" section.
  If you want to change partitions, you may need to delete partitions and create new ones. The existing partitions are displayed in Setup.

- **Computer name**
  You can find information on this in the "Name of the PC station (Page 61)" 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 R2**
    The CAL are not registered or recorded in the operating system.

Installation of specific language components for a multilingual installation

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.

Settings made after installation of the Windows multilingual user interface pack

The selected language is English.
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.

Recommendations for PC stations with Windows 7

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

- **Deactivate "Automated System Recovery/System Restore"**
  Deactivate the Automated System Recovery for all drives. Select System > System Protection in the Control Panel and disable system restore.

Additional information

- Section "How to install the Message Queuing Service (Page 65)"
- Section "How to configure the Microsoft Internet Information Service (IIS) for the server (Page 67)"

5.3.6 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 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 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.

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".
5.3.7 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
- Information Server
- PC station where BATCH archives are stored.

Deactivate the service for all other installations.

Requirement

- You are logged on as an Administrator.

Installing IIS on 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 Administrative Tools > Server Manager.
   The "Server Manager main window" opens.

2. Click the "Add Roles" link in the "Roles Summary" area.
   The "Add Roles" wizard opens.

3. Click "Next".
   The server roles that can be installed are listed.

4. Select the "Web Server (IIS)" check box.

5. Click "Next".
   The installation information is displayed.

6. Click "Next".
   The list of role services is displayed.
7. Select the following role services in the "Web Server" folder of the tree view:
   - Common HTTP Features
     - Static Content
     - Default Document
     - Directory Browsing
     - HTTP Errors
   - Application Development Features
     - ASP.NET
     - .NET Extensibility
     - ASP
     - ISAPI Extensions
     - ISAPI Filters
   - Integrity and Diagnostics
     - HTTP Logging
     - Request Monitor
   - Security
     - Basic Authentication
     - Windows Authentication
     - Request Filtering
   - Performance
     - Static Content Compression

8. Select the following role services in the "Management Tools" folder of the tree view:
   - 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".
   Review your selection.

10. Click the "Install" button.
    The installation is performed.

11. Once the installation is complete, click "Close".

12. Close the “Server Manager main window”.

---

**Installing IIS on Windows 7**

1. Select **Control Panel > Programs and Features**.

2. Click the “Turn Windows features on or off” link on the left side.
   If the “User Account Control” dialog opens, click the “Yes” button.

3. In the "Windows Features" dialog, open the "Internet Information Services" folder in the tree view.
4. Select the following services in the "Web Management Tools" subfolder of the "Internet Information Services" folder:
   - IIS Management Service
   - IIS Management Console
   - IIS Management Scripts and Tools
   - IIS 6 Management Compatibility
     IIS Metabase and IIS 6 configuration compatibility
     IIS 6 WMI Compatibility

5. Select the following services in the "World Wide Web Services" subfolder of the "Internet Information Services" folder:
   - Application Development Features
     .NET Extensibility
     ASP
     ASP.NET
     ISAPI Extensions
     ISAPI Filters
   - Common HTTP Features
     HTTP Errors
     Default Document
     Static Content
     Directory Browsing
   - Performance Features
     Static Content Compression
   - Security
     Request Filtering
     Basic Authentication
     Windows Authentication
   - Health and Diagnostics
     Request Monitor
     HTTP Logging

6. Click "OK" to start the installation.

5.3.8 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
The version you need is listed in the *Process Control System PCS 7; PCS 7 Readme* file (see "Preface (Page 9)").

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 123)"

5.3.9 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 setting:

"Swap file managed automatically"

Configuring virtual memory

Refer to the online help of the operating system to learn how to open the dialog for configuring virtual memory.
5.3.10 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 83)".

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.
   - For PC stations that are involved in process mode, the power saving plan should be set as follows:
     - Turn off the monitor: Never
     - Put computer to sleep: Never

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 94)".

4. Use the Event Viewer to check that all services and drivers are functioning correctly.

5. Server for process mode: Optimize background services
   Select the option to optimize the system performance for background services in the advanced system properties in the Control Panel. ("Advanced" tab; "Processor scheduling" section).

5.3.11 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
5.3.12 How to install additional components

Virus scanners, updates and Microsoft Office products

Important information on the required software, versions and availability is available in the Process Control System PCS 7; PCS 7 Readme file (see "Preface (Page 9)").

You should install the following software after installing the operating system components:

- **Updates** for the operating system
- **Virus scanners** approved for the current PCS 7 version
- **Microsoft Office products** approved for the current PCS 7 version (if needed)
  You must also install additional Microsoft components for some PC configurations.
  - Language versions:
    Install the additional Microsoft component in the language version of the operating system.
    The language version of the component can be distinguished by using a language-specific directory and/or the language code in the file name.
  - Procedure:
    Install the components named in the PCS 7 Readme file.

**Note**

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

Installation at a later time

You can also install these components at a later time, especially for pre-configured PC stations (product bundles).

5.3.13 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

<table>
<thead>
<tr>
<th>PC station</th>
<th>Service or software that needs to be installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC station to which the BATCH archives are transferred</td>
<td>IIS service</td>
</tr>
<tr>
<td>PC station from which the transfer of BATCH archives will be activated</td>
<td>FTP service</td>
</tr>
<tr>
<td>PC station from which the transferred BATCH archives will be accessed</td>
<td>BATCH Control Center (BatchCC)</td>
</tr>
</tbody>
</table>

Additional information

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

5.3.14 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.
5.4 Installing the PCS 7 software

5.4.1 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 (see "Preface (Page 9)").

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 (see "Preface (Page 9)").
- 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 144)".

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 section "Setting up user groups and users (Page 83)".

Using Microsoft Office
You can find information about this in the section "How to install additional components (Page 72)".

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.

You can find more information on this subject in the following sections:

- Section "How to access PC stations outside a subnet (Page 114)"
- Section "How to configure encrypted communication between the PC stations (Page 118)"

**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
5.4.2 How to install in a network

Preparation

If you want to install several PCs via network connections, preparatory steps are required. To be able to install on multiple computers at the same time, you need to make the contents of both SIMATIC PCS 7 DVDs available in a separate storage location (shared network path).

The following rules apply to the storage.

Rules

- The folders must be called "DVD_1" or "DVD_2" and must be located within a shared folder.

  Note

  Create a network copy of the two SIMATIC PCS 7 DVDs with the following structure:

  ...\PCS7_Vxx\DVD_1\n  ...\PCS7_Vxx\DVD_2\n
- The name of the access path to the network copy of the DVDs (including the folder "DVD_1" or "DVD_2") cannot contain more than 85 characters.

- 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 the respective 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 78) ".
5.4.3 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 program packages 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 program package either before or after the PCS 7 installation. You can find information on transferring license keys in the documentation SIMATIC; Automation License Manager.

You can find a description of the license concept in the section "PCS 7 licenses and quantity structures (Page 100)".

Checking the installation requirements

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

If program packages are missing, a message appears indicating the missing components. The setup program is terminated after the message is confirmed. Install the missing program packages. 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.
- Select in addition the program package for this OS server: "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 program packages.
   - ... 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 144)".
   - "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"

**Note**

**Restart of the PC station required**

Some of the PCS 7 program packages require a restart of the PC during installation.

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 more information on this subject in the following sections:

- Section "How to set the communication module for connecting to the terminal bus (Page 109)"
- Section "How to access PC stations outside a subnet (Page 114)"

Display of installed software

You can check which program 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.

Virus scanners, updates and Microsoft Office products

You can find information about this in the section "How to install additional components (Page 72)".

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.

5.4.4 How to prepare the engineering station for multi-user operation

Some of the STEP 7 configuration data is saved in a database. Access to this data is performed and coordinated via a Sybase server.

For this reason, a running Sybase server is an essential requirement. After the installation of STEP 7, this Sybase server runs in the context of the logged-on user and is started automatically when the user logs on.
For certain applications in multi-user operation, it may be necessary to maintain the project data on a central server computer and process the data from several client computers.

For the required Sybase server to run on the central server computer, a user must also be logged on to the central server computer in accordance with the specification above.

To remove this requirement, you can set up the Sybase server as a service with the "setsybserv.exe" application.

### Setting up a Sybase server as a service

To set up the ES as a service, you must proceed as follows:

- Start the "setsybserv.exe" application with advanced rights (run as administrator) in the following directory:
  - For 32-bit operating systems: "%CommonProgramFiles%\Siemens\S7UBTOOX\"
  - For 64-bit operating systems: "%CommonProgramFiles(x86)%\Siemens\S7UBTOOX\"
- You will see the currently valid setting in the dialog box. By selecting the other option in each case, you can switch between the two configurations "Sybase server as service" and "Sybase server as user application".
- Then, set up the access rights to the shared folder in which you will make your project data available on the central server computer for multi-user operation:
  - Insert the "SYSTEM" user in the share permissions and allow "full access".
- Restart the computer in order for the settings to take effect.

---

**Note**

**Operation of the "Configure SIMATIC Workstation" dialog**

With the "Sybase server as service" configuration, the "Configure SIMATIC Workstation" dialog can no longer be operated in the context of a logged-on user.

---

### 5.4.5 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.

### 5.4.6 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 126)".

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*.

5.4.7 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

- *Process Control System PCS 7; PCS 7 Readme* file (see "Preface (Page 9)"

5.4.8 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 in setup" column defines the standard component in the PCS 7 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 underlined 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

<table>
<thead>
<tr>
<th>Installation / Group in Setup</th>
<th>Component in the PCS 7 setup</th>
<th>User group / users</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>-</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>PCS 7 Engineering</td>
<td>SIMATIC HMI</td>
<td>OS project engineer, Project administrators, Operator</td>
</tr>
<tr>
<td></td>
<td>BATCH Engineering</td>
<td>SIMATIC BATCH</td>
<td>BATCH project engineer</td>
</tr>
<tr>
<td>Route Control Engineering</td>
<td>RC_ENGINEER, RS_MAINTENANCE, RC_OPERATOR_L1, RC_OPERATOR_L2</td>
<td>Route Control project engineer, Route Control administrator (with all rights), Operators, You can find additional information about operator authorization in the Process Control System PCS 7; SIMATIC Route Control Manual.</td>
<td></td>
</tr>
<tr>
<td>Runtime / Server</td>
<td>OS server</td>
<td>SIMATIC HMI</td>
<td>Project administrators, Operator, Operator groups</td>
</tr>
<tr>
<td></td>
<td>BATCH server</td>
<td>SIMATIC BATCH</td>
<td>Operator</td>
</tr>
<tr>
<td>Route Control server</td>
<td>RS_MAINTENANCE, RC_OPERATOR_L1, RC_OPERATOR_L2, RC_OPERATOR_L2</td>
<td>Operator</td>
<td></td>
</tr>
<tr>
<td>Runtime / Single station</td>
<td>OS single station</td>
<td>SIMATIC HMI</td>
<td>Project administrators, Operator, Operator groups</td>
</tr>
<tr>
<td></td>
<td>BATCH single station</td>
<td>SIMATIC BATCH</td>
<td>Operator</td>
</tr>
<tr>
<td>Route Control single station</td>
<td>RS_MAINTENANCE, RC_OPERATOR_L1, RC_OPERATOR_L2, RC_OPERATOR_L2</td>
<td>Operator</td>
<td></td>
</tr>
</tbody>
</table>
### 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.

<table>
<thead>
<tr>
<th>Installation / Group in Setup</th>
<th>Component in the PCS 7 setup</th>
<th>User group / users</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runtime / Client</td>
<td>OS clients</td>
<td>SIMATIC HMI</td>
<td>Project administrators, Operator, Operator groups</td>
</tr>
<tr>
<td>BATCH clients</td>
<td>SIMATIC BATCH</td>
<td>Operator</td>
<td>Note: The Windows user of the BATCH client must be allocated on the BATCH server to users of SIMATIC BATCH.</td>
</tr>
<tr>
<td>Route Control clients</td>
<td>RS_MAINTENANCE, RC_OPERATOR_L1, RC_OPERATOR_L2</td>
<td>Operator</td>
<td></td>
</tr>
<tr>
<td>SIMATIC Logon</td>
<td>LOGON_Administrator</td>
<td>Project administrators</td>
<td></td>
</tr>
<tr>
<td>SIMATIC Management Console</td>
<td>SIMATIC Management Console</td>
<td>SIMATIC Management Administrators, SIMATIC Management Users</td>
<td></td>
</tr>
<tr>
<td>SIMATIC NET</td>
<td>SIMATIC NET</td>
<td>SIMATIC NET</td>
<td>When the &quot;SIMATIC NET&quot; 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.</td>
</tr>
<tr>
<td>Post-installation of STEP 7</td>
<td>STEP 7</td>
<td>Siemens TIA Engineer</td>
<td>Post-installation of STEP 7 products, e.g. service packs</td>
</tr>
</tbody>
</table>
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 section "How to set permissions for the project paths (Page 87)".

**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.
- Domains 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 R2

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:
   gedit.msc
   The "Group Policy Object Editor" dialog window opens.
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
- Manual SIMATIC; SIMATIC Management Console

5.4.9 Installing PCS 7 libraries of older PCS 7 versions

If you install or remove an older version of the PCS 7 Library, PCS 7 Basis Library or PCS 7 Advanced Process Library following the installation of PCS 7, you must re-install the current versions of PCS 7 Basis Library or PCS 7 Advanced Process Library by means of the PCS 7 general setup afterwards. Do not use the product setup of these libraries to do this. This applies, for example, to PCS 7 libraries, which are located in the Additional_Products folder of SIMATIC PCS 7 DVD 2/2.

5.4.10 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.
Installing PC stations

5.4 Installing the PCS 7 software

Requirement

- PCS 7 is installed.
- 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.
- The following steps are performed with administrator rights

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 Process Control System PCS 7; PCS 7 - Readme file (see "Preface (Page 9)").
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 permissions

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

- **Access to the system information of the "System info" WinCC channel**
  Windows users with standard user permissions 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 permissions:
  - CreateDatabase
  - DatabaseAttach
  - DatabaseDetach

Additional information

- Manual *SIMATIC; SIMATIC STEP 7*
- Online help WinCC Information System
- Manual Process Control System PCS 7; SIMATIC BATCH
5.4.11 Firewall in PC stations

Windows firewall
PCS 7 uses the operating system firewall (see "Preface (Page 9)"; Process Control System PCS 7; PCS 7 Readme file). The required settings are made during the PCS 7 setup.

Requirement for using a firewall on the system bus
The CP 443-1 must have particular firmware versions installed if you intend to use a firewall on the system bus. You can find additional information on this in the section "Preconfigured PC systems for PCS 7 (product bundles) (Page 47)".

Additional information
- Section "Components for connection to the terminal bus/plant bus (Page 48)"
- Section "How to access PC stations outside a subnet (Page 114)"

5.4.12 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 can find additional information on this in the section "Appendix B - Approved configurations on a PC station (Page 144)".

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 require the PC station to be restarted for the update.

**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 software from the SIMATIC PCS 7 product line for central administration and management 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. Some of the advantages of using the Management Console are listed below:

- **Cost and time savings through:**
  - Reduced installation costs due to more efficient workflow
  - Significant reduction of administrative overhead due to centralized management of the software versions of all PC stations in a PCS 7 plant

- **Easy and reliable use through:**
  - Clear and self-explanatory representation of the action states of different PC stations in a PCS 7 plant
  - No unintentional negative impact on productive operation thanks to upstream security mechanisms
  - Secure communication due to the use of appropriate security mechanisms of the operating system

- **Transparency and always up-to-date "as built" documentation:**
  - Fast analysis of the installed components
  - Easier planning of plant updates/upgrades
  - Long-term support for plant life cycle services
  - Easy analysis of configurations and compatibility
  - Central monitoring of the security status (patches)

---

**Additional information**

- Section "Notes on installing PCS 7 (Page 74)"
- The Management Console software packages are available on the *Process Control System; SIMATIC PCS 7 DVD*. 
5.4.13 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.

5.5 Installing drivers for PCS 7

5.5.1 Drivers for communications processors

5.5.1.1 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 be 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" program 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 122)".

Settings for the system bus

Make the following settings for the system 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"
5.5.1.2  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 system bus) in the plant:

- Setting of PC stations for communication via the system bus:
  - Enable the ISO protocol.
  - Disable the TCP/IP protocol.

- Exception for the setting on PC stations for communication via the system bus. Select the protocol you use on the system 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 communication module of type CP 16xx.

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 (Internet protocol version 4 (TCP/IPv4))
   - System 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 system 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".

**Additional information**

You can find more information on redundant network connections in the documentation *Process Control System PCS 7; Fault-Tolerant Process Control Systems*.

### 5.5.1.3 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.

### 5.5.1.4 How to prepare a PC station with CP 16xx for operation in PCS 7

**Introduction**

If a communication module is used in a PC station, the NDIS adapters needs to be configured in the following situations:

- You want to monitor the diagnostics of network components on the system bus with a maintenance station (MS).
  A communication module is used on the PC of the maintenance station for access to the system bus.

- An automation system in a SIMATIC PCS 7 BOX is to be loaded using an external engineering station.
  A communication module is used on the engineering station for access to the system bus.

You can learn which communication modules can be used in the product overview *Process Control System PCS 7; Released Modules*.

**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 communication module of the PC station.
As of PCS 7 V7.1, the communication 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 16xx:
     Device name "SIMATIC Miniport <Type of released communication module ... > 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.
5.5.2 Additional Devices and Drivers for PCS 7

5.5.2.1 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**

Information on the required software and availability of the drivers is available in the *Process Control System PCS 7; PCS 7 Readme* file (see "Preface (Page 9)").

Overview of additional devices and drivers

**Multiple monitors on a single PC**

<table>
<thead>
<tr>
<th>Device</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor on Matrox Multi VGA</td>
<td>Section &quot;How to activate a multi-VGA graphics card (Page 97)&quot; Up to a maximum of 4 monitors on a PC.</td>
</tr>
<tr>
<td>Connect monitors via internal interfaces</td>
<td>You can connect one monitor to one port. Up to a maximum of 2 monitors on a PC.</td>
</tr>
</tbody>
</table>

**PC station on redundant network**

<table>
<thead>
<tr>
<th>Driver</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network adapters</td>
<td>• Redundant, fault-tolerant terminal bus based on the Parallel Redundancy Protocol (PRP)</td>
</tr>
<tr>
<td></td>
<td>• Redundant, fault-tolerant terminal bus based on the INTEL TEAM mode</td>
</tr>
<tr>
<td></td>
<td>• Redundant, fault tolerant system bus based on the modular switches of the SCALANCE series</td>
</tr>
<tr>
<td></td>
<td>• Redundant, fault tolerant system bus with AS 410H</td>
</tr>
<tr>
<td></td>
<td>Documentation <em>Process Control System PCS 7; Fault-tolerant Process Control Systems</em></td>
</tr>
</tbody>
</table>

**Time signal via DCF77**

<table>
<thead>
<tr>
<th>Driver</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time reception service</td>
<td>Section &quot;How to activate the DCF77 reception service (Page 99)&quot;</td>
</tr>
<tr>
<td></td>
<td>Documentation <em>Process Control System PCS 7; Time synchronization</em></td>
</tr>
</tbody>
</table>

**Acoustic or visual signal generator**

<table>
<thead>
<tr>
<th>Driver</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horn module</td>
<td>The required drivers are automatically installed with PCS 7.</td>
</tr>
<tr>
<td></td>
<td>Documentation <em>Process Control System PCS 7; Operator Station</em></td>
</tr>
</tbody>
</table>
Installing PC stations

5.5 Installing drivers for PCS 7

Acoustic signal generator

<table>
<thead>
<tr>
<th>Driver</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound card</td>
<td>Installation medium for the sound card or Windows standard; Section &quot;Assigning the driver to the sound card (Page 98)&quot;</td>
</tr>
</tbody>
</table>

Smart cards

<table>
<thead>
<tr>
<th>Driver</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart card reader</td>
<td>WinCC Information System; Information on the suitable smart card reader and the required driver is available in the Process Control System PCS 7; PCS 7 Readme file (see &quot;Preface (Page 9)&quot;).</td>
</tr>
</tbody>
</table>

Additional information

Section "Optional hardware components (Page 50)"

5.5.2.2 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 7 Ultimate
- 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**

You can find the multi-VGA graphics cards approved for the PCS 7 version and information on the hardware requirements in the product overview, Process Control System PCS 7; Released Modules.
The drivers of the graphics cards are available on the data medium of the software package: "PCS7_Software_Support_and_Tools" of the PCS 7 version to be installed in the "01_Drivers \DISPLAY" folder.

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 cards approved for PCS7 in the online help WinCC Information System.

5.5.2.3 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 the availability of the drivers approved for use with PCS 7, refer to the PCS 7 Process Control System PCS 7 Readme file (see "Preface (Page 9)").

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 Process Control System PCS 7; PCS 7 Readme file (see "Preface (Page 9)").
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.
5.5.2.4 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

Information on the required software and availability of the drivers is available in the Process Control System PCS 7; PCS 7 Readme file (see "Preface (Page 9)").

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
5.6 Licensing

5.6.1 PCS 7 licenses and quantity structures

Important terms

The following table lists terminology that is important for licensing:

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>A license provides the right to use products. This right is in the form of:</td>
</tr>
<tr>
<td></td>
<td>● CoL (Certificate of License)</td>
</tr>
<tr>
<td></td>
<td>● License key</td>
</tr>
<tr>
<td>CoL (Certificate of License)</td>
<td>The CoL certifies the license. The product may only be used by the license</td>
</tr>
<tr>
<td></td>
<td>owner or authorized persons.</td>
</tr>
<tr>
<td>License key</td>
<td>The license key is the “technical representative” of the license (also called</td>
</tr>
<tr>
<td></td>
<td>an &quot;electronic license stamp&quot;).</td>
</tr>
</tbody>
</table>

License properties

Each license consists 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:

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

- The following license types are available to you:

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

**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

You can manage license keys centrally with the software Automation License Manager. When you use the package installation for PCS 7, the Automation License Manager is automatically included in the installation.

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

- Documentation SIMATIC; Automation License Manager
- Installation manual Process Control System PCS 7; Licenses and Configuration Limits

5.6.2 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.

### 5.7 Preparing PC stations

#### 5.7.1 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.

<table>
<thead>
<tr>
<th>Step</th>
<th>What?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create the &quot;Logon_Administrator&quot; user group for SIMATIC Logon (Page 106)</td>
</tr>
<tr>
<td>2</td>
<td>Set the language for a user (MUI) (Page 107)</td>
</tr>
<tr>
<td>3</td>
<td>Set the communication module for connecting to the terminal bus (Page 109)</td>
</tr>
<tr>
<td>4</td>
<td>Set up the connection between the PC station and system bus (Page 111)</td>
</tr>
<tr>
<td>5</td>
<td>Set the standard network adapters (Page 113)</td>
</tr>
<tr>
<td>6</td>
<td>Change the transfer rates and operating modes in the PC network (Page 122)</td>
</tr>
<tr>
<td>7</td>
<td>Install security patches, hotfixes, service packs (Page 123)</td>
</tr>
<tr>
<td>8</td>
<td>Activate redundancy for high-availability PCs (Page 126)</td>
</tr>
<tr>
<td>9</td>
<td>Download the network configuration to the PC stations (Page 128)</td>
</tr>
</tbody>
</table>

5.7.2 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 drivers in the *Process Control System PCS 7, PCS 7 - Readme* file (see "Preface (Page 9)"). You can find a description of the chip card readers in the section "Overview of additional devices and drivers for PCS 7 (Page 96)."

- **Using chip cards**
  Make sure that you reformat all chip cards that were formatted with SIMATIC Logon prior to V1.3. As of version V1.3, SIMATIC Logon uses improved security algorithms. 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.

5.7.3 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

5.7.4 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.

5.7.5 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".

**Specifying the network type**

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 "Local Group Policy Editor" dialog window opens.
3. In the tree view, select the folder *Local Computer Policy > Computer Configuration > Windows Settings > Security Settings > Network List Manager Policies*
5. In the "Location Type" area, select the "Private" option button.

**See also**

How to activate redundancy for fault-tolerant PCs (Page 126)

**5.7.6 How to set up a work group for connection to the terminal bus**

If you want to operate PC stations of PCS 7 in a work group, you have to check the settings of the network configuration.

After installation of the operating system, the network profile "Public network" is configured by default for the network connections. The network profile "Public network" is not approved for the terminal bus in PCS 7.

**Procedure**

1. Select the menu command "Change adapter settings" in the Network and Sharing Center.
2. Select the network adapter that is to establish the connection to the terminal bus.
3. Use the shortcut menu to open the "Properties ..." dialog.
4. Make the following adjustments:
   – Click "Configure". Select the "Power Management" tab and clear the "Allow the computer to turn off this device to save power" check box. Click "OK".
   – Deactivate the "Microsoft" protocols for system bus connection (with engineering station or OS server).

**Note**

**Internet protocol version 6 (TCP/IPv6)**

The "Internet Protocol Version 6 (TCP/IPv6)" check box should not be cleared.

   – Assign a gateway address for the terminal bus in the properties for "Internet Protocol Version 4 (TCP/IPv4)".

5. In the Network and Sharing Center, select the menu command "Change advanced sharing settings". The "Change sharing options for different network profiles" dialog box opens.

6. Expand the displayed information for the "Home or Work" network profile.

7. Select the following check boxes:
   – Turn on network discovery
   – Turn on file and printer sharing
   – Disable "Public folder sharing"

**Result**

The active networks are displayed in the Network and Sharing Center.

- The network profile "Home or Work" has been selected for the terminal bus. A gateway address has been entered in the properties of the network adapter.
- PC stations with several network adapters:
  No changes are required for the system bus.

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

**Introduction**

You next check or assign the addresses on the system bus and the access point for downloading and configuring the PC stations.
Perform the following steps:

- **PC stations on the system bus**
  Check or assign addresses of the network adapters:
  - PC station connected to system bus via CP 16xx communications processor.
  - PC station on system bus connected via standard network adapter (only if the ISO protocol is used on the system 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 connected to system bus via CP 16xx communications processor**

If the PC station on the system bus is to communicate via the CP 16xx, perform the following steps for all CP 16xx:

**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 System 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 System Bus> > Address".
4. Set the addresses (either TCP/IP address or MAC address, depending on the protocol).

**PC station on system bus connected via standard network adapter**

If you want to use the ISO protocol on the system 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 System Bus> > Address".
2. Make a note of the MAC address, which you will need when configuring the PC station.
3. Select the menu command "Change advanced sharing settings" in the Network and Sharing Center. The "Change sharing options for different network profiles" dialog box opens.
4. Expand the displayed information for the "Home or Work" network profile.

5. Select the following check boxes:
   – Disable "File and printer sharing"
   – Disable "Client for Microsoft network"
   – Enable the ISO protocol

Note

**Special features of communication using a server with several network adapters**

Read the 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*

**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 shortcut 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".

**Additional information**

You can find information about suitable standard network adapters and (CP 16xx) communications processors in the product overview *Process Control System PCS 7; Released Modules*.

**5.7.8 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".

5.7.9 How to access PC stations outside a subnet

**Communication beyond network limits**

PC stations can be located in different subnets in a network. The Subnets can, for example, be connected by routers and protected by a firewall.

You need to configure the communication paths so that the PC stations in different subnets can communicate with each other.

- Make the settings for the configuration of the PC stations in the "SIMATIC Shell".
- If a firewall protects the networks, you need to adapt the firewall rules.

**Simatic Shell**

"Simatic Shell" is part of PCS 7 and is used for central maintenance and diagnostics of all PC stations integrated in the client-server system.

Select the PC stations that should as a gateway to another subnet. In these PC stations, you need to register a PC station of the other subnet in Simatic Shell. You need to configure the appropriate settings on the PC station of the other subnet. The logon of the PC stations is described in the following procedure.
After mutual logon, all participating PC stations of the subnet can communicate beyond the subnets boundaries. In Simatic Shell, each PC station of a group is informed about the current status of the other PC stations in the group.

When the status of a PC station changes, a message is sent to all stations, for example:

- When a PC station has archived a project
- When a PC station is shut down.
- When a PC station is started up and thus enters the group.

**Adapting the firewall**

A firewall can block communication between networks. In order for the PC stations to communicate with each other beyond network boundaries, you need to adapt the local Windows firewall to the firewall rules for the PC station. Enter the range with the IP addresses of the PC stations from other networks or the entire IP range of the other networks as described below:

1. Open it using the Windows start menu: **Control Panel > Windows Firewall > Advanced settings.**
   
   The "Windows Firewall with Advanced Security" dialog opens.

2. Under "Inbound Rules", select one by one all affected firewall rules, e.g. CCAgent, WinCC ProjectManager.

3. In the "Scope" tab in the properties, add the IP addresses or IP scopes of the communication partners to "Remote IP address".

**Requirement**

Make the following settings as an administrator.

**Procedure**

1. In the tree view of Windows Explorer, select the "SIMATIC Shell" folder on the PC station.

2. Select the "Settings..." command from the shortcut menu.

   The "Communication Settings" dialog opens.

3. Check the setting in the field "Multicast Life Time (TTL)".

   The value gives the maximum number of transitions between various subnets (IP parameters TTL).

4. In the "Multicast Proxy" area, the network address of the PC station of the other subnet in the mask for the connection to the other subnet.

**Note**

**Number of PC stations that make a network-spanning connection**

Only enter a "Multicast Proxy" for PC stations if they require cross-network communication.

- If higher availability is required, you can enter the network addresses of multiple PC stations (recommendation: 2).

- Do not enter too many network addresses, because this will cause a high load on the network by broadcast frames.
5. Add the addresses to the list of network partners using the "Add" button.

6. Check if the communication between the subnets needs to be protected. If you want to set up encrypted communication for a PC station, you can enable this.

**Note**

**Using encrypted communication**

If you use encrypted communication, the only PC stations that can communicate with each other are those that have registered a shared key for the communication connection. Encrypted communication makes it difficult for potential attackers to determine information about the process mode or to interfere with process mode.

You can find information on the procedure in the section "How to configure encrypted communication between the PC stations (Page 118)".

**Recommendation:**

Enable encrypted communication when communication is to be performed across the boundaries of the subnet.

7. Confirm your entries with "OK".

**See also**

Changing settings for encrypted communication (Page 116)

5.7.10 **Changing settings for encrypted communication**

As of PCS 7 V8.1, you can use encrypted communication between the PC stations that are involved in process mode. Encrypted communication makes it difficult for potential attackers to determine information about the process mode or to interfere with process mode.

You can find information on the procedure and PC stations in the section "How to configure encrypted communication between the PC stations (Page 118)". Make the settings for the configuration of the PC stations in the "SIMATIC Shell".
Icons in Simatic Shell

You can see the status of the PC stations in "Simatic Shell". You can see icons on the name of the PC stations in Simatic Shell. The following table shows the meaning of icons:

<table>
<thead>
<tr>
<th>Status</th>
<th>Meaning of the icons</th>
<th>PC stations shown in Simatic Shell</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Icon 1]</td>
<td>The PC station communicates only through encrypted connections.</td>
<td>PC stations for which encrypted communication is enabled with the same pre-shared key (PSK). If the encrypted communication is enabled on a PC station, this PC station can only establish communication connections to PC stations on which the same PSK is configured. <strong>Note:</strong> Environments with separate PSKs can be specified within a network.</td>
</tr>
<tr>
<td>![Icon 2]</td>
<td>The PC station communicates through encrypted and unencrypted connections (migration mode).</td>
<td>PC stations for which the unencrypted connection is enabled or the encrypted communication with the same PSK. If communication is required through both encrypted and unencrypted connections for a PC station, you can enable migration mode. <strong>Note:</strong> Only use migration mode as a temporary solution. Recommended objective for the plant: encrypted communication between all PC stations of the plant.</td>
</tr>
<tr>
<td>![Icon 3]</td>
<td>The PC station communicates only through unencrypted connections.</td>
<td>PC stations for which communication is unencrypted.</td>
</tr>
</tbody>
</table>

Changing settings for encrypted communication (situations)

If you change settings for encrypted communication, you must always perform the changes for all PC stations in the entire plant.
You can find information about the procedure in the section "How to configure encrypted communication between the PC stations (Page 118)".

The following are typical situations in which you change the settings for encrypted communication:

- **When a plant experiences a standstill**
  It is assumed that the communication can fail between any PC stations.

- **During ongoing operation of the plant**
  It is assumed that process mode must always be continually running.
  Typical situations:
  - Changing settings for encrypted communication
  - Software update

**Note**

Communication between computers with encrypted and unencrypted communication is only possible in migration mode. You can find additional information on migration mode in the section "How to use migration mode for changing encrypted communication (Page 120)."
5.7.11 How to configure encrypted communication between the PC stations

You can enable encrypted communication for the stations that actively engage in process mode:

- Operator station
- Engineering station
- SIMATIC Route Control
- SIMATIC BATCH

Requirements

- If you want to change settings for encrypted communication in process mode of the plant, read the following section: "Changing settings for encrypted communication (Page 116)".
- For redundant servers, the redundancy synchronization is completed before each step.
- Process mode is ended on the relevant PC station.

Using encrypted communication for a PC station

1. In the tree view of Windows Explorer, select the "SIMATIC Shell" folder on the PC station.
2. Select the "Settings..." command from the shortcut menu.
   The "Communication Settings" dialog opens.
3. Enable the "Encrypted communication" check box.
   The "Set PSK" dialog box opens.

Note

Changing the PSK

Read the section "How to change the PSK for encrypted communication (Page 119)";
Changing the PSK.

When the "Set PSK" option is enabled, you can change the PSK. Click "Set".

4. Enter characters with a high password strength for the PSK.
   The key must be at least 8 characters long and include numbers and symbols in addition
   to uppercase/lowercase letters.
5. Confirm your entries. Click "OK".
6. If you want to use an available port instead of the port allocated by default, you can specify the assignment of incoming ports.

7. Check setting for the "Migration mode" check box.
   Read the section "How to use migration mode for changing encrypted communication (Page 120)".

8. Click "OK".

Additional information
- Section "How to access PC stations outside a subnet (Page 114)"
- Online help "Simatic Shell"

5.7.12 How to change the PSK for encrypted communication

The following procedure is only required if you want to change the PSK during ongoing operation.

Requirements
- Always perform each individual step for all PC stations in the entire plant.
  You can find information on the procedure in the section "How to configure encrypted communication between the PC stations (Page 118)".
- For redundant servers, the redundancy synchronization is completed before each step.
- Process mode is ended on the relevant PC station.

Basic procedure

**Note**

If the encrypted communication is enabled on a PC station, this PC station can only establish communication connections to PC stations on which the same PSK is configured.

Note the following example: Communication with inconsistent settings for encrypted communication in a plant

1. Switch on migration mode for all PC stations:
   Leave the PSK unchanged and select the "Migration mode" check box.

2. Disable encrypted communication for all PC stations:
   Clear the "Encrypted communication" check box.

3. Enable new PSK for all PC stations:
   Select the "Encrypted communication" check box, enter the new PSK and select the "Migration mode" check box.

4. Switch off migration mode for all PC stations:
   Leave the PSK unchanged and clear the "Migration mode" check box.
Example: Communication with inconsistent settings for encrypted communication in a plant

Example of an initial situation

<table>
<thead>
<tr>
<th>System</th>
<th>Communication</th>
<th>PSK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server_A</td>
<td>Encrypted, migration mode enabled</td>
<td>AAA</td>
</tr>
<tr>
<td>Client_1</td>
<td>Encrypted, migration mode enabled</td>
<td>AAA</td>
</tr>
<tr>
<td>Server_B</td>
<td>Encrypted, migration mode enabled</td>
<td>111</td>
</tr>
<tr>
<td>Client_2</td>
<td>Unencrypted</td>
<td>-</td>
</tr>
</tbody>
</table>

Reaction

<table>
<thead>
<tr>
<th>Type of communication between the PC stations</th>
<th>Server_A</th>
<th>Client_1</th>
<th>Server_B</th>
<th>Client_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server_A</td>
<td>-</td>
<td>Encrypted</td>
<td>No connection</td>
<td>Unencrypted</td>
</tr>
<tr>
<td>Client_1</td>
<td>Encrypted</td>
<td>-</td>
<td>No connection</td>
<td>Unencrypted</td>
</tr>
<tr>
<td>Server_B</td>
<td>No connection</td>
<td>No connection</td>
<td>-</td>
<td>Unencrypted</td>
</tr>
<tr>
<td>Client_2</td>
<td>Unencrypted</td>
<td>Unencrypted</td>
<td>Unencrypted</td>
<td>-</td>
</tr>
</tbody>
</table>

Additional information

- Section "How to access PC stations outside a subnet (Page 114)"

5.7.13 How to use migration mode for changing encrypted communication

You use migration mode when you want to change the settings for encrypted communication during ongoing operation of a plant.

You can find information on the procedure in the section "How to configure encrypted communication between the PC stations (Page 118)".

Note

Using migration mode only temporarily

You should use migration mode only as a temporary solution when you want to change the settings for encrypted communication throughout the plant.

Communication between PC stations with encrypted and unencrypted communication:

- Communication between computers with encrypted and unencrypted communication is only possible when migration mode is enabled.
- Encrypted communication between PC stations is only possible when the same PSK is configured. Read the section "How to change the PSK for encrypted communication (Page 119)"; Reacting to an inconsistent setting for encrypted communication.
Enabling encrypted communication in a plant

Make sure that the following requirements are met:

- For redundant servers, the redundancy synchronization is completed before each step.
- Process mode is ended on the relevant PC station.

Perform each step for all PC stations in the entire plant before performing a further step.

1. **All PC stations in the plant:**
   Select the following options in the properties of the PC station in SIMATIC Shell:
   - "Encrypted communication" check box:
   - "Migration mode" check box:

   **Note**
   **Encrypted communication in a plant**
   Before you exclusively enable encrypted communication, you need to ensure the following for all required PC stations:
   - Encrypted communication is enabled and migration mode is allowed.
   - The same PSK is configured.

2. **All PC stations in the plant:**
   Clear the "Migration mode" check box in the properties of the PC station in SIMATIC Shell.

Disabling encrypted communication in a plant

Make sure that the following requirements are met:

- For redundant servers, the redundancy synchronization is completed before each step.
- Process mode is ended on the relevant PC station.

Perform each step for all PC stations in the entire plant before performing a further step.

1. **All PC stations in the plant:**
   Select the "Migration mode" check box in the properties of the PC station in SIMATIC Shell.

   **Note**
   **Migration mode is enabled**
   Before you disable encrypted communication, you need to ensure the following for all required PC stations:
   - Encrypted communication is enabled and migration mode is allowed.

2. **All PC stations in the plant:**
   Disable the "Encrypted communication" option in the properties of the PC station in SIMATIC Shell.
5.7.14 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
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 Autonegotiation setting (procedure for the automatic negotiation of the best transmission mode between two network interfaces which are directly connected to one another).

The term autonegotiation denotes the automatic identification and negotiation of transmission rate and 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

<table>
<thead>
<tr>
<th>Location of use</th>
<th>Network node</th>
<th>Opening the configuration dialog window</th>
<th>Parameter setting</th>
</tr>
</thead>
</table>
| **PC**          | Communication module, for example: CP 16xx | 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 Start menu > Control Panel > 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 ... e.g.: SCALANCE X-400 | • Configuration via Telnet or Web Based Management (WBM)  
• Open the configuration dialog box for the switch via Internet Explorer: http://\<TCP/IP address> | Port configuration |
| **AS**          | Communication module E.g.: 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") |
| **AS**          | CPU, e.g.: CPU 410-5H | HW Config: Properties of CPU 410-5H > Slot X5 / X8 > Properties of the module (Port1/ Port2) > "Options" tab > "Connection" group | Default setting: "Automatic setting" (Autonegotiation) |

You can find information on approved hardware in the product overview *Process Control System PCS 7; Released Modules.*

### 5.7.15 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 in the SIMATIC Customer Support under the entry ID: 18490004 (http://support.automation.siemens.com/WW/view/en/18490004).

Additional information

- Section "How to install service packs for the operating system (Page 69)"

5.7.16  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...)
  - Communications processors
- Other devices
  - Network adapters
  - Switches
  - PC stations (PCs from third parties - reduced information)

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

Enabling SNMP (enabling Windows function)

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

<table>
<thead>
<tr>
<th>Operating system</th>
<th>SNMP or SNMP service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 7</td>
<td>Simple Network Management Protocol</td>
</tr>
<tr>
<td>Windows Server 2008 R2</td>
<td>SNMP service</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Accept SNMP packages from any host&quot;</td>
<td>No additional settings required</td>
</tr>
</tbody>
</table>
| "Accept SNMP packages from this host" | • 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. |

**Note**

**Recommendation for domain controller**

Select the "Accept SNMP packages from this host" option. Enter the system-specific settings.

6. Check the settings for the "Send authentication trap" option:

Enter the name used in the configuration under "Accepted community names" with read/write authorizations if you do not install the following software on this system:

"DiagMonitor (Page 132)"

**Additional information**

- 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 *Process Control System PCS 7; Security Concept PCS 7 and WinCC - Basic Document*
    - You can find information on availability in the *Process Control System PCS 7; PCS 7 - Readme* file (see "Preface (Page 9)").
- You can find information on use of SNMP and DiagMonitor for monitoring PCs in the following section "DiagMonitor (Page 132)".
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
- 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 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 109)

5.7.18 How to disable user switching

Introduction
For PCS 7, the use of the Windows functionality "Fast user switching" with Windows 7 / 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.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fast user switching</strong></td>
</tr>
<tr>
<td>The application of this function can trigger unwanted reactions, e.g. the restart of a PC station.</td>
</tr>
</tbody>
</table>

### 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.

### 5.7.19 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*. 
5.8 Notes on add-ons and utilities

5.8.1 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 129)
  - Virus scanners (Page 132)
  - Burner software (Page 132)
  - DiagMonitor (Page 132)
- Utilities:
  - Screen savers (Page 135)
  - Defragmentation programs (Page 135)

5.8.2 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 regularly updated information about the version compatible with your PCS 7 version and about using RealVNC under Entry ID 55422236 in Industry Online Support:

  **Note**
  **Disabling the keyboard shortcut "Ctl+Alt+Del" when using RealVNC**
  A software emulation of the RealVNC software allows the keyboard shortcut “Ctrl+Alt+Del” to remain operable when a key lock is active.
  If you want to prevent users from using this keyboard shortcut in active process mode, you must adapt a group policy. You can find information about this on the Internet on the support pages of RealVNC under the following keyword: “Secure Attention Sequence”
  Activate the policy describe there with the "None" option.

- **RDP**
  The use of the Remote Desktop Protocol (RDP) is solely permitted 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 plant (for example, OS servers, engineering stations).

  **Note**
  **Activated key lock prevents local operation in the case of a locked system**
  You can cancel the key lock on the computer by performing the following steps:
  1. Using a remote connection, connect to the session that is currently active on the computer.
  2. Log on as a user who is authorized to exit process mode.
  3. Exit process mode. The key lock is deactivated.
  4. Use the keyboard shortcut "Ctrl+Alt+Del" locally on the computer and take over the active session. The remote connection is automatically disconnected.
  5. Restart process mode.

**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 83)"). 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.

Additional information
- Section "Subsequent installation or updating (Page 89)"
- White paper Process Control System PCS 7; Security Concept PCS 7 and WinCC - Basic Document
  You can find information on availability in the Process Control System PCS 7; PCS 7- Readme (see "Preface (Page 9)").
- Operating system online help

5.8.3 Automatic logon to the operating system
A PC station with password protection is enabled by default after the operating system starts in the logged out state.
If a PC station should go immediately to the state for logon of the operator or to process mode after startup, the logon procedure must run automatically on the operating system. This is permitted in PCS 7.
Recommendation

Password-protected logon, for example, is made available by the Microsoft tool offered on the Internet: „Autologon“. This tool stores the password in encrypted form.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downloads</td>
</tr>
<tr>
<td>Always check for malware when installing downloads.</td>
</tr>
</tbody>
</table>

5.8.4 Virus scanners

You can find information about this in the section "How to install additional components (Page 72)".

5.8.5 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.

5.8.6 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

Observe the requirements for the hardware and software.

Note
You can find detailed, up-to-date information about approved PC hardware and operating systems in the manuals DiagMonitor Getting Started and PC DiagMonitor Software.

The SNMP service is enabled. You can find additional information on this in the section "Enable and configure SNMP (Page 124)".

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 and configuring DiagMonitor software (overview)

Information on the software version of the latest PCS 7 version is available in the Process Control System PCS 7; PCS 7 Readme file (see "Preface (Page 9)").

Note
Version of DiagMonitor software already installed

Check the Control Panel to see if a version of the "DiagMonitor" software is already installed. If an older version of DiagMonitor is installed, remove it.

Perform the following steps for the installation and configuration:

1. Install the operating system-specific DiagMonitor: software for your PC:
   - DiagMonitor on PCS 7 PC stations (standard version)
   - DiagMonitor on domain controllers

2. Configuring SNMP

3. Configure DiagMonitor
DiagMonitor on PCS 7 PC stations

1. Run the following file: DiagMonitor_Silent_Install.bat
   Wait until the installation process is complete.
2. Run the following file: CM_Activate.exe
3. Reboot the computer.

DiagMonitor on domain controllers

Note

Stricter security policies have to be observed for domain controllers.

Installation of a web server on a domain controller is not compatible with the security settings for PCS 7.
This is why the "Diagnostics Monitor" button on a faceplate (PCs stations in the diagnostic area of a maintenance servers) for monitoring the domain controller is disabled.

1. Run the following file: Start.exe
2. Select the "WebServer" option.
3. Confirm the license conditions.
4. Confirm the security settings.
5. Wait until the installation process is complete.
6. Run the following file: CM_Activate.exe
7. Reboot the computer.

Configuring SNMP

Configure SNMP. Follow the procedure described in section "Enable and configure SNMP (Page 124)".

Note

Domain controller on SIMATIC IPC with DiagMonitor

Make the following settings:
- For Community "SOL": "Read" rights.
- Remove all unknown communities.

Configure 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".
   - Optional:
     Configure any additional events, for example, 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...**

### 5.8.7 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.

### 5.8.8 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 the license key code.

**Recommendation:**
Always exclude the license keys from processing 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.

5.8.9 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>
Installing PC stations

5.8 Notes on add-ons and utilities
6.1 Appendix A - Use of software packages

6.1.1 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 on this in the section "PCS 7 licenses and quantity structures (Page 100)".

<table>
<thead>
<tr>
<th>Applications</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation License Manager</td>
<td>For transferring and managing license keys</td>
</tr>
<tr>
<td>STEP 7</td>
<td>PCS 7 basic engineering:</td>
</tr>
<tr>
<td></td>
<td>• SIMATIC Manager for managing project objects</td>
</tr>
<tr>
<td></td>
<td>• HW Config for the hardware configuration</td>
</tr>
<tr>
<td></td>
<td>• NetPro for the network configuration</td>
</tr>
<tr>
<td>SCL</td>
<td>Structured Control Language (S7 SCL) High-level language for programming user function blocks in accordance with IEC 61131-3</td>
</tr>
<tr>
<td>CFC</td>
<td>Continuous Function Chart (CFC) - For the graphical configuration of continuous automation functions in accordance with IEC 61131-3, with test and commissioning functions</td>
</tr>
<tr>
<td>SFC</td>
<td>Sequential Function Chart (SFC) - For the graphical configuration of sequential production sequences (step sequencers), with test and commissioning functions</td>
</tr>
<tr>
<td>PH</td>
<td>Plant Hierarchy (PH) - For displaying a project in a plant view; which enables the user to gain a quick overview of project resources</td>
</tr>
<tr>
<td>IEAPO</td>
<td>• Process Object view (PO) - For providing a process-control oriented view of basic automation data</td>
</tr>
<tr>
<td></td>
<td>• Import Export Assistant (IEA)</td>
</tr>
<tr>
<td></td>
<td>You will find more information on this topic in the section &quot;Optional software packages (Page 142)&quot;.</td>
</tr>
<tr>
<td>PCS 7 Library</td>
<td>Standardized process-control libraries with preconfigured and tested blocks and drivers for hardware (e.g., blocks for I/O modules)</td>
</tr>
<tr>
<td>WinCC</td>
<td>Visualization and configuration software containing standards for the fast implementation of simple to complex visualization tasks in single or multiple station operation</td>
</tr>
<tr>
<td>AS-OS Engineering</td>
<td>AS/OS connection for faceplates, messages, and tags</td>
</tr>
</tbody>
</table>
Applications | Brief description
--- | ---
PV InsInfo-Server | Tool which supplies the WinCC variable browser with ES variables
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 141)".
 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 142)".
PDM | Components for engineering field devices
| You will find more information on this topic in the section "Optional software packages (Page 142)".

### 6.1.2 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 "PCS 7 licenses and quantity structures (Page 100)".

<table>
<thead>
<tr>
<th>Program name</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation License Manager</td>
<td>For transferring and managing license keys</td>
</tr>
</tbody>
</table>
| WinCC | Visualization and configuration software for visualization in single or multiple station operation
| Additional information |
| • License key levels: Installation manual Process Control System PCS 7; Licenses and Configuration Limits |
| • Section "Licensing (Page 100)" |
| 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. |
6.1.3 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 on this in the section "PCS 7 licenses and quantity structures (Page 100)".

<table>
<thead>
<tr>
<th>Program name</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation License Manager</td>
<td>For transferring and managing license keys</td>
</tr>
</tbody>
</table>
| 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  
• Additional information  
  – License key levels:  
    Installation manual Process Control System PCS 7; Licenses and Configuration Limits  
    – Section "Licensing (Page 100)"                                                      |
| 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                                                                                                           |
6.1.4 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 on this in the section "PCS 7 licenses and quantity structures (Page 100)".

<table>
<thead>
<tr>
<th>Program name</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation License Manager</td>
<td>For transferring and managing license keys</td>
</tr>
<tr>
<td>Route Control Base</td>
<td>Basis for all Route Control installations Contains documentation on SIMATIC Route Control.</td>
</tr>
<tr>
<td>Route Control client</td>
<td>For in-depth diagnostics of the route and its elements</td>
</tr>
<tr>
<td>Route Control Engineering</td>
<td>For producing and managing any number of sub-routes with elements</td>
</tr>
</tbody>
</table>
| 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 Additional information  
                                • License key levels:  
                                Installation manual Process Control System PCS 7; Licenses and Configuration Limits  
                                • Section "Licensing (Page 100)" |
| 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                                                       |

6.1.5 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 on this in the section "PCS 7 licenses and quantity structures (Page 100)".

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 (see "Preface (Page 9)").
# Add-ons in the PCS 7 setup

You install these applications via the PCS 7 system setup.

<table>
<thead>
<tr>
<th>Applications</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEAPO</td>
<td>Import-Export-Assistant (IEA) - Tool for rapid bulk engineering (e.g. importing models and process tags)</td>
</tr>
<tr>
<td>S7-PLCSIM</td>
<td>Simulate CPU of the automation system</td>
</tr>
<tr>
<td>SFC Visualization</td>
<td>Displaying and operating sequential control systems</td>
</tr>
<tr>
<td>VXM (Version Cross Manager)</td>
<td>Version comparison of engineering data, including graphic differential display</td>
</tr>
<tr>
<td>PCS 7 PID Tuner</td>
<td>Optimize control loops</td>
</tr>
<tr>
<td>DOCPRO</td>
<td>Create plant documentation and circuit books</td>
</tr>
<tr>
<td>OpenPCS 7</td>
<td>Interfaces based on OPC and OLE DB for data exchange</td>
</tr>
<tr>
<td>PCS 7 Faceplates;</td>
<td>Faceplates for the operator station</td>
</tr>
<tr>
<td>PCS 7 Basic Faceplates;</td>
<td></td>
</tr>
<tr>
<td>PCS 7 Advanced Faceplates</td>
<td></td>
</tr>
<tr>
<td>DotNet Framework</td>
<td>A software platform developed by Microsoft for developing and executing programs that were created with different programming languages on various platforms.</td>
</tr>
<tr>
<td>SIMATIC Logon</td>
<td>Assign roles defined for the PCS 7 applications to the Windows users/user groups along with the corresponding administrator rights</td>
</tr>
<tr>
<td></td>
<td>Activate user dialogs for applications managed with SIMATIC Logon.</td>
</tr>
<tr>
<td></td>
<td>Enable and log functions</td>
</tr>
<tr>
<td>SIMATIC PDM</td>
<td>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.</td>
</tr>
<tr>
<td>WebNavigator Remote Publisher</td>
<td>For remote publishing of images and other relevant data for a PCS 7 Web server.</td>
</tr>
<tr>
<td>SIMATIC Management Console</td>
<td>Central administration and management of SIMATIC software products</td>
</tr>
<tr>
<td></td>
<td>Determine inventory data</td>
</tr>
<tr>
<td>S7-F Systems</td>
<td>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.</td>
</tr>
</tbody>
</table>

## 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.*
6.2 Appendix B - Approved configurations on a PC station

6.2.1 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 148))
- as an OS server and operator station (client installation on server (Page 150))
- as an OS server and BATCH server (server on server (Page 149))

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, 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 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

---

**Note**

**Installation of an ES on an OS PC**

If you wish to install an engineering system (ES) on an existing OS, it is absolutely essential to remove the installed PCS 7 OS version first and then perform the "Engineering Station" installation.

---

**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

<table>
<thead>
<tr>
<th>Concerns</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS 7 project</td>
<td>Only use the PC configurations described here within a PCS 7 project.</td>
</tr>
<tr>
<td>Program packages</td>
<td>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).</td>
</tr>
<tr>
<td>Performance</td>
<td>Activating several program packages will impair the performance of the individual applications.</td>
</tr>
<tr>
<td>Configuring the PC station</td>
<td>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 ST PCS 7.</td>
</tr>
</tbody>
</table>
| 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)  
Information Server  
The Information Server can be installed on a Process Historian. |
| OpenPCS 7              | OpenPCS 7 can be installed on the following PC stations:  
- Separate PC station  
- OS client  
- OS server  
- OS single station system |
| 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 150)"
- Section "Information on configuration type "-" (Page 151)"
- Section "Information on configuration type "A" (Page 151)"
- Section "Information on configuration type "B" (Page 151)"

---

### 6.2.2 Configuration tables

#### 6.2.2.1 Configurations with engineering station, clients and single station system

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<thead>
<tr>
<th>Purpose</th>
<th>Engineering station</th>
<th>OS single-station system</th>
<th>OS client</th>
<th>BATCH single station system</th>
<th>BATCH client</th>
<th>Route Control single station system</th>
<th>Route Control Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard configuration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering station</td>
<td></td>
<td>A (Page 151)</td>
<td>B (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>OS single-station system</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>OS client</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td></td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>BATCH single station system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BATCH Client</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td></td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
</tr>
</tbody>
</table>
### Purpose

<table>
<thead>
<tr>
<th>Standard configuration</th>
<th>Engineering station</th>
<th>OS single-station system</th>
<th>OS client</th>
<th>BATCH single station system</th>
<th>BATCH client</th>
<th>Route Control single station system</th>
<th>Route Control Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Control single station system</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td></td>
</tr>
<tr>
<td>Route Control Client</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 6.2.2.2 Configurations with server operating system (server to server)

**Table 2 - Configurations with server operating system (server to server)**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>OS server</th>
<th>Redundant OS server</th>
<th>Maintenance server</th>
<th>Redundant maintenance server</th>
<th>BATCH server</th>
<th>Redundant BATCH server</th>
<th>Route Control server</th>
<th>Redundant Route Control server</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS server</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
</tr>
<tr>
<td>Redundant OS server</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td></td>
</tr>
<tr>
<td>Maintenance server</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
</tr>
<tr>
<td>Redundant maintenance server</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td></td>
</tr>
<tr>
<td>BATCH server</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
</tr>
<tr>
<td>Redundant BATCH server</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td></td>
</tr>
<tr>
<td>Route Control server</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redundant Route Control server</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Process Historian and Information Server (archive server)**

You can install the Process Historian and Information Server on a single PC station.
6.2.3 Configurations with server operating system (client installation on server)

Table 3 - Configurations with server operating system (client installation on server)

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Engineering station</th>
<th>OS single-station system</th>
<th>OS client</th>
<th>BATCH single station system</th>
<th>BATCH client</th>
<th>Route Control single station system</th>
<th>Route Control Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard configuration</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>OS server</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redundant OS server</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>Maintenance server</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>Redundant maintenance server</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>BATCH Server</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>Redundant BATCH server</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>Route Control server</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
</tr>
<tr>
<td>Redundant Route Control server</td>
<td>--- (Page 151)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
<td>--- (Page 151)</td>
<td>X (Page 150)</td>
</tr>
</tbody>
</table>

6.2.3 Information on configurations

6.2.3.1 Information on configuration type "X"

No restrictions

Read the configuration notes for the respective standard configurations.
6.2.3.2  Information on configuration type "-"

Restriction

This configuration is not approved.

6.2.3.3  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.

6.2.3.4  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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