SIEMENS

Manual • 08/2016

# SIMATIC PCS 7 Standard Architectures

## SIMATIC PCS 7 V8.2

https://support.industry.siemens.com/cs/ww/en/view/109739629

# Legal information

### Warning notice system

This manual contains information that must be observed to ensure your personal safety and to prevent property damage. Notices referring to your personal safety are highlighted in the manual by a safety alert symbol; notices referring to property damage only have no safety alert symbol. The notices shown below are graded according to the degree of danger.

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

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

| | |
|---|---|
|  **CAUTION** | **indicates that minor personal injury may result if proper precautions are not taken.** |

| | |
|---|---|
| **NOTICE** | **indicates that damage to property may result if proper precautions are not taken.** |

If multiple levels of hazards can occur, the warning is always displayed with the highest possible level. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

### Qualified personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

### Proper use of Siemens products

Note the following:

| | |
|---|---|
|  **CAUTION** | **Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, they must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation, and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be adhered to. The information in the relevant documentation must be observed.** |



Siemens AG
Industry Sector
P.O. Box 48 48
90026 NÜRNBERG
GERMANY

V1.1
Ⓟ 08/2016 Subject to change without prior notice

### Registered trademarks

All names identified by ® are registered trademarks of the Siemens AG.
Third parties using for their own purposes any other names in this document which refer to trademarks might infringe upon the rights of the trademark owners.

### Disclaimer of liability

We have reviewed the contents of this publication for agreement with the hardware and software described. Nevertheless, we cannot assume responsibility for any deviations that may arise. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

### Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

To protect plants, systems, machines, and networks against cyber threats, it is necessary to implement – and to continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions form only one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines, and networks Systems, machines, and components should only be connected to the enterprise network or the Internet if and to the extent that it is necessary and using appropriate security measures (e.g. firewalls and network segmentation).

In addition, you should pay attention to Siemens' recommendations on appropriate protective measures. You can find more information about Industrial Security by visiting http://www.siemens.com/industrialsecurity.

The products and solutions from Siemens undergo continuous development to make them even more secure. Siemens strongly recommends applying product updates as soon as they are available and to always use the latest product versions. Using versions that are obsolete or are no longer supported can only increase the risk of cyber threats.

To ensure that you are always kept informed about product updates, subscribe to the Siemens industrial security RSS feed at http://www.siemens.com/industrialsecurity.



Siemens AG
Industry Sector
P.O. Box 48 48
90026 NÜRNBERG
GERMANY

V1.1
Ⓟ 08/2016 Subject to change without prior notice

# Table of contents

# 1 Introduction

This document describes the architectures and components of SIMATIC PCS 7 in a basic structure. In addition to the mentioned architectures, various options and configured versions are also displayed. SIMATIC PCS 7 is a highly scalable process control system with numerous topologies that are based on redundancy as well as optional hardware and software features.

This document should help you by simplifying your choice:

- Architectures based on the number of users, inputs and outputs
- SIMATIC PCS 7 options; for example, SIMATIC BATCH, SIMATIC Route Control, Asset Management and Fieldbus
- Degree of system availability and network topologies
- Supply concept for 24 V DC

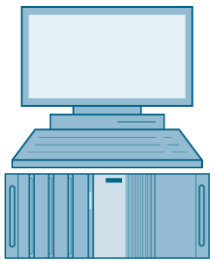
The various configurations in this document are compared on the basis of schematic diagrams and a sample component list.

**Note** The architectures shown in this document contain only the necessary basic licenses. In order to achieve the desired quantity structure, in addition to the basic licenses, you must also take into account the corresponding set of volume licenses.

**Note** The components that are stated in the parts lists refer to the 2016 PCS 7 catalog. You may need to check whether more up-to-date components are available.

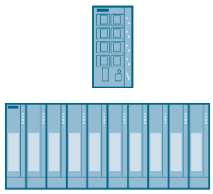
**Note** The parts lists for the individual configurations do not contain any network components, since a large number of variants are available for this.
To do this, use Chapter, 16 Network architecture.

Apart from this, the "PCS 7 - PC Configuration (V8.2)" manual is available for download in Industry Online Support. This document contains additional information about the PC components that are used with PCS 7.

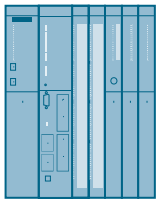


Industrial PC used for Engineering or Operation

Industrial PC used as Server, not intended for Engineering or Operation



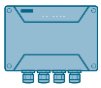
Active or Ethernet Component or managed Switch



Automation System

Input/Output Rack

Network Transition (e.g. PROFIBUS DP/PA)



Active Field Distributor

Field Instrument or Device

Industrial Ethernet /PROFINET Network Connection

PROFIBUS DP Network Connection

PROFIBUS PA Network Connection

FOUNDATION Fieldbus Network Connection

Input / Output Signal Connection

RS-232 Redundancy Monitor Cable

**Note**

This caption shows schematic representations of the components and does not show the real picture of the individual components, as their shape, the terminal type and the modular structure of the selected components may be different.

# 2 Selection guide

At the planning stage, the task is to create a Decentralized Control System (DCS) with a scalable and flexible architecture. The sample configurations that are listed below will help you to choose the right configuration to meet your requirements and demands of the properties you need like the size, availability and number of operator stations.

Every configuration in this document contains a parts list that provides an overview of the PCS 7 components that are used.

When choosing your architecture, you should first determine the following system criteria:

1. Number of inputs and outputs for the process
2. Number of operators that work with the system

**Number of inputs and outputs connected to the system**

To determine the number of signals entering or leaving the system, you must consider several media:

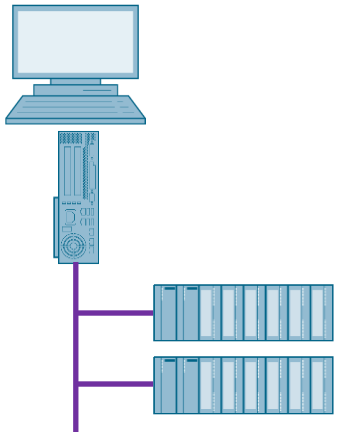
1. The number digital and analog I/O to be installed.
2. The number of variables (boolean, integer or floating point) exchanged between the PCS 7 System and external systems such as PLCs, serial interfaces, etc., and running on protocols such as Modbus, PROFIBUS, PROFINET or Ethernet.
3. Inputs and outputs that are read or written via bus systems, such as AS-Interface.

**Number of persons operating the system**

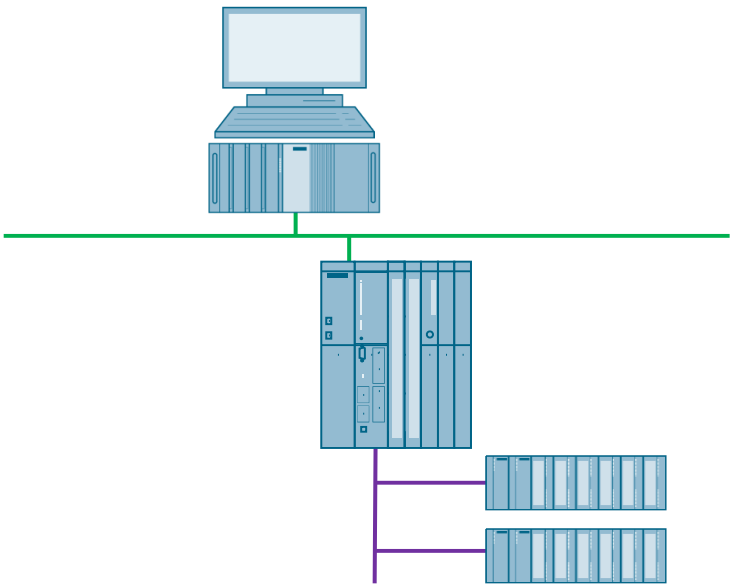
The chosen architecture must be designed for the total number of users, operators and engineers who eventually work on the system. This number determines the required number of individual workplaces.

**Note** SIMATIC PCS 7 enables a seamless extension of your system with full use of existing equipment. Both software and hardware components satisfy this requirement equally.

## 2.1 Entry-level systems (e.g. PCS 7 BOX RTX)

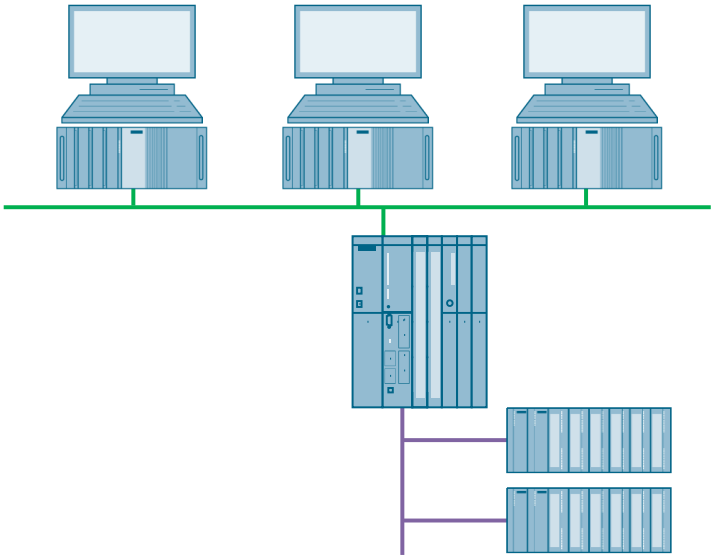
| **Anzahl der Ein-/Ausgänge:** | |
|---|---|
| 50-300 | |
| **Anzahl der Bediener:** | |
| 1 | |
|  |  |

## 2.2 Single station system

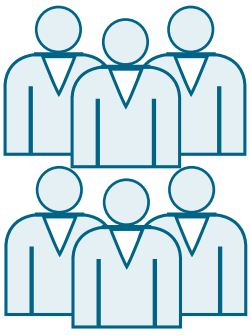
| **Anzahl der Ein-/Ausgänge:** | |
|---|---|
| 250 – 600 | |
| **Anzahl der Bediener:** | |
| 1 | |
|  |  |

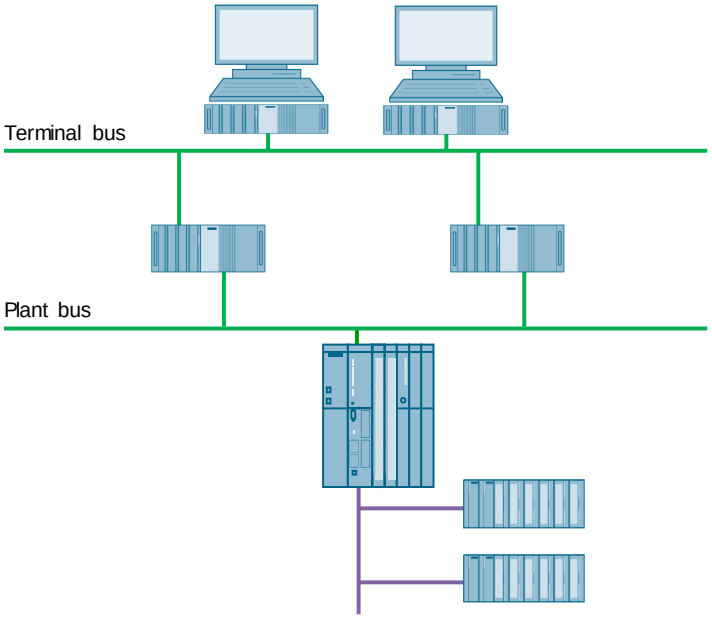
## 2.3 Multi-user system

| Anzahl der Ein-/Ausgänge: |
| --- |
| 500-1000 |
| **Anzahl der Bediener:** |
| 2-8 |
|  |



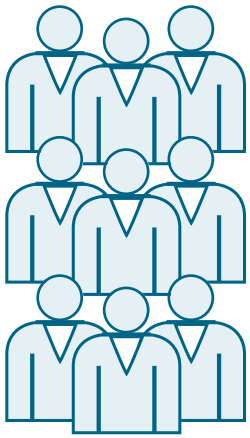
## 2.4 Client/server system

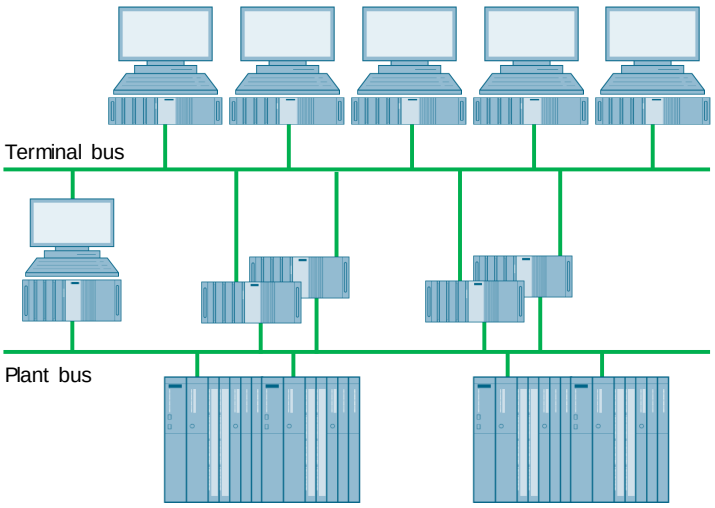
| Anzahl der Ein-/Ausgänge: |
| --- |
| 800-2000 |
| **Anzahl der Bediener:** |
| 3-40 |
|  |



## 2.5 Client/Server System with several servers

| Anzahl der Ein-/Ausgänge: |
| --- |
| 1500 -120,000 |
| **Anzahl der Bediener:** |
| 12-40 |





# 3 Entry-level systems

### Entry-level systems

If one or two operators and less than 300 I/Os must be supported, the SIMATIC PCS 7 BOX RTX system is a powerful and cost-effective solution.

The PCS 7 BOX RTX has a software AS based on the proven Windows Automation Center (WinAC) technology . This software CPU runs with the Ardence RTX®° real-time operating system under Windows. It provides high-performance control logic for the design and memory.

The PCS 7 BOX RTX is available in two versions:

1. Automation System (AS), Operator Station (OS) and Engineering Station (ES)
2. Automation System (AS) and Operator Station (OS)

The PCS 7 BOX RTX can be equipped with a 2-Screen Multi VGA graphics card which enables the connection of two monitors to the system.

### Separate Engineering Station

Engineering can be carried out by a separate Engineering System. In this case, the SIMATIC PCS 7 BOX RTX consists of just the AS and OS. This means that the Engineering station can be used as an Operator station when doing this.

### SIMATIC PCS 7 BOX RTX as an OS client

When combined with a larger SIMATIC PCS 7 system, the SIMATIC PCS 7 BOX can be used as an OS client for the OS server. At the same time, the AS is connected to the OS server as part of the SIMATIC PCS 7 BOX RTX.

### SIMATIC PCS 7 AS RTX system

SIMATIC PCS 7 provides a Microbox automation system with a software controller for less demanding applications. The Microbox system is based on the SIMATIC Microbox IPC427D platform, on which the Windows 7 operating system runs. When combined with the Windows real-time extension Ardence RTX® and the WinAC RTX 2010 software controller, this system offers a compact controller for applications at the system level.

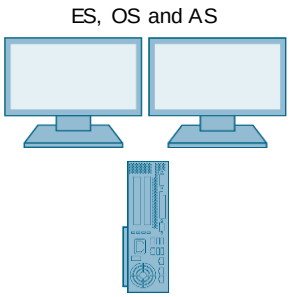
### SIMATIC PCS 7 OS client IPC427D (Microbox)

The SIMATIC Microbox PC is also available as an OS client as version SIMATIC IPC 427D PCS 7 OS Client and can be used in SIMATIC PCS 7 systems as a client for the Operator station and SIMATIC Batch.

**Note** Fieldbus components, racks, modules and field devices are not listed in the following bill of materials.

## 3.1 Entry-level system with dual monitor

In this configuration, the PCS 7 BOX RTX system is used as an ES, OS, and AS with two monitors.




**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, Operator Station, and Automation System** | | | | |
| 1 | | 6ES7650-4BB00-2LA0 | PCS 7 V8.2 BOX RTX ES/OS SYSTEM (WINAC RTX 2010);WINDOWS 7 ULTIMATE 32BIT; PCS 7 V8.2 PREINSTALLED | 1) 2) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | | 24 V DC power supply | Buffered power supply | Section 18.4 |

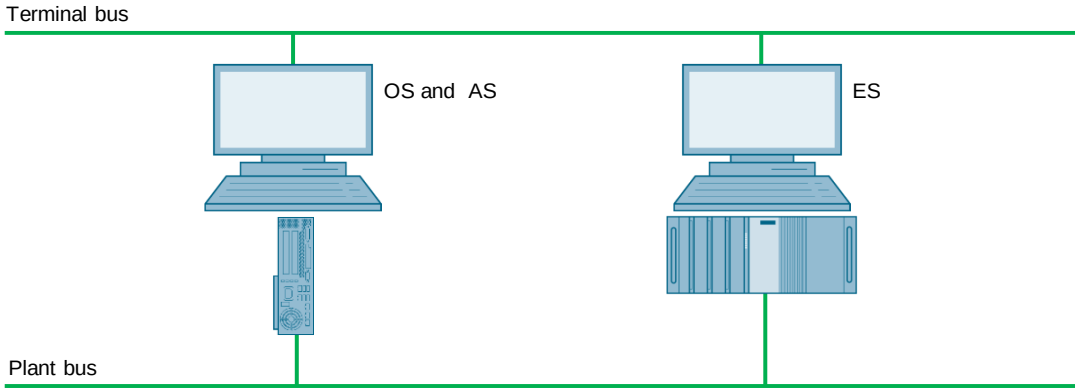
**Note**

1) Please use the PCS 7 BOX configurator, since different versions of the PCS 7 BOX are available; e.g., 24V DC or 110/230V AC.

2) The number of POs can be increased later by means of extra volume licenses.

## 3.2 Separate ES in the entry-level system

In this configuration, the PCS 7 BOX RTX system is used as an OS and AS. The ES is designed as a separate system.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Operator Station and Automation System** | | | | |
| 1 | | 6ES7650-4BB00-2MA0 | PCS 7 V8.2 BOX RTX OS RUNTIME (WINAC RTX2010); WINDOWS 7 ULTIMATE, 32BIT; PCS 7 V8.2 PREINSTALLED | 1) 2) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | 3) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

**Note**

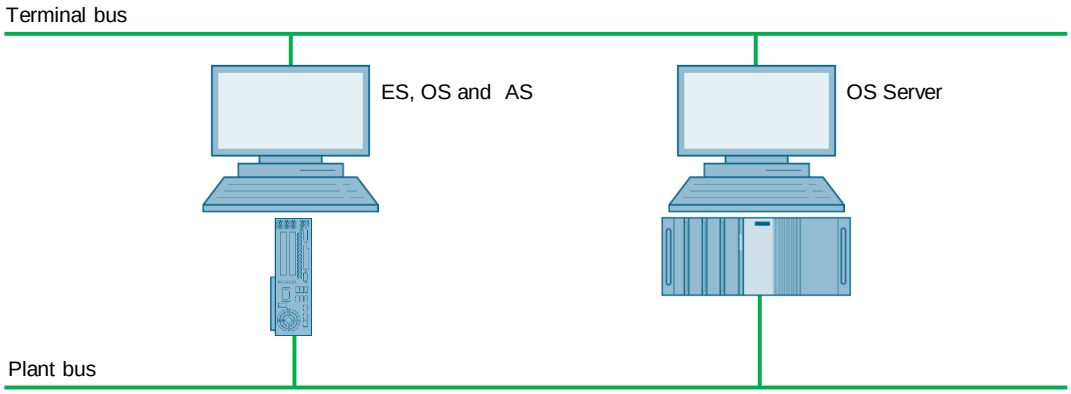
1) Please use the PCS 7 BOX configurator, since different versions of the PCS 7 BOX are available; e.g., 24V DC or 110/230V AC.

2) The number of POs can be increased later by means of extra volume licenses.

3) The Engineering station is not intended for use as a second Operator station.

## 3.3 Entry-level SIMATIC PCS 7 BOX RTX as an ES and OS Client

In this configuration, the PCS 7 BOX RTX system is used as an ES, OS, and AS. The OS Server is designed as a separate system.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, Operator Station, and Automation System** | | | | |
| 1 | | 6ES7650-4BB00-2LA0 | PCS 7 V8.2 BOX RTX ES/OS SYSTEM (WINAC RTX 2010);WINDOWS 7 ULTIMATE 32BIT; PCS 7 V8.2 PREINSTALLED | 1) 2) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2, WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 2) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | | 24 V DC power supply | Buffered power supply | Section 18.4 |

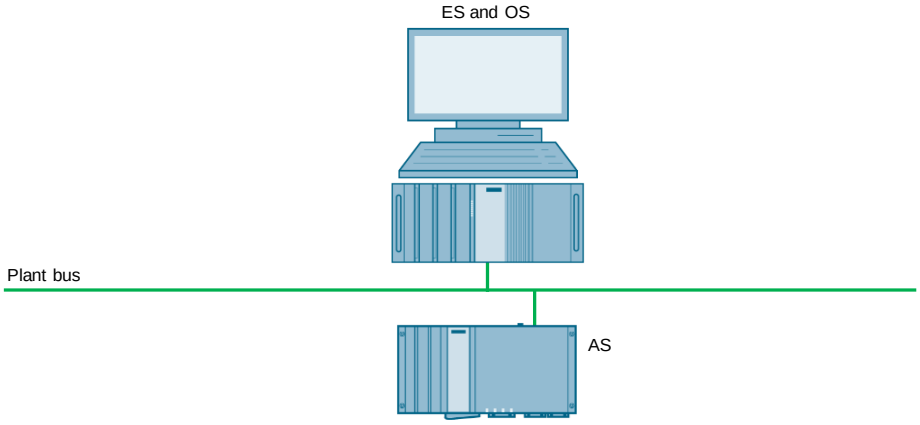
**Note**

1) Please use the PCS 7 BOX configurator, since different versions of the PCS 7 BOX are available; e.g., 24V DC or 110/230V AC.

2) The number of POs can be increased later by means of extra volume licenses.

## 3.4 SIMATIC PCS 7 AS RTX system

In this configuration, the PCS 7 BOX RTX system is used as an AS. The ES and OS are configured on a separate system.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7 654-0UE23-0XX2 | SIMATIC PCS 7 AS RTX AUTOMATION SYSTEM BASED ON IS IPC427D, AS RT PO 100 | 1) 2) |
| | | 24 V DC power supply | Buffered power supply | Section 18.4 |
| **Engineering Station and Operator Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) PCS 7 AS RTX controller needs a 24 V DC power supply

# 4 Single station system

**Single station system**

For small process control systems where engineering or operation tasks are carried out by only one user, the single-user architecture of PCS 7 offers a cost-effective solution. In this architecture, the functionality of the Engineering Station (ES) and the Operator Station (OS) is integrated into one PC.

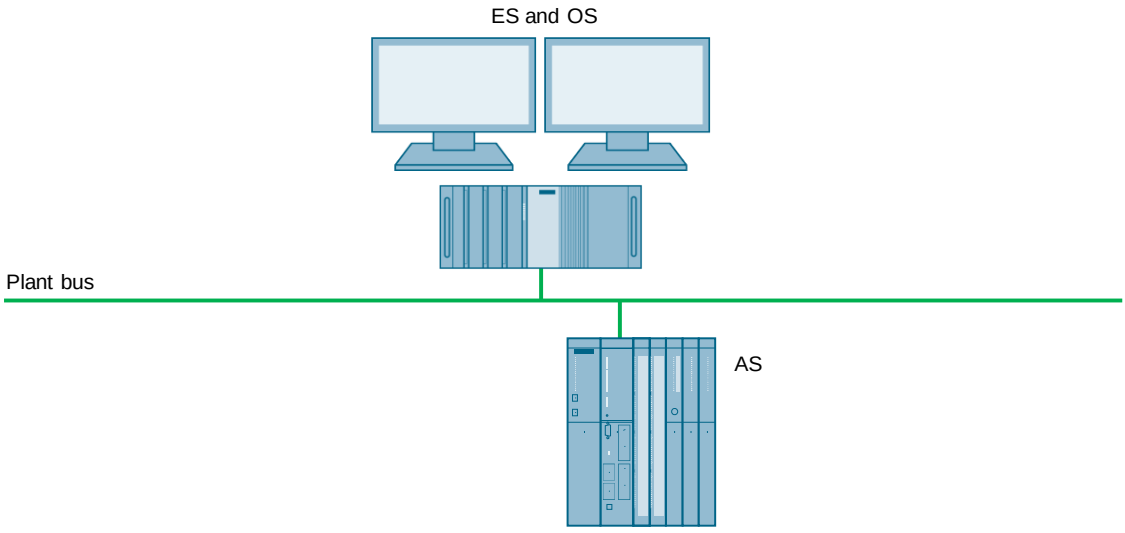
**Dual Monitor**

A single station or an Engineering Station can be expanded with a standard graphics card that makes it possible to connect up to two monitors.

The system can be expanded with a “4-screen” Multi VGA graphics card that makes it possible to connect up to four monitors to one system.

## 4.1 Single-user station with dual monitor

This configuration is a system in which the ES and OS are used on one PC as a single-user system with two monitors.



**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station and Operator Station** | | | | |
| 1 | | 6ES7660-6DC10-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, MULTI MONITOR 2 SCREENS VIA ONBOARD INTERFACES (ADAPTER CABLE), BCE, PCS 7 V8.2 , WIN 7 ULTIMATE 64BIT | 1) |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 2) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 2) 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

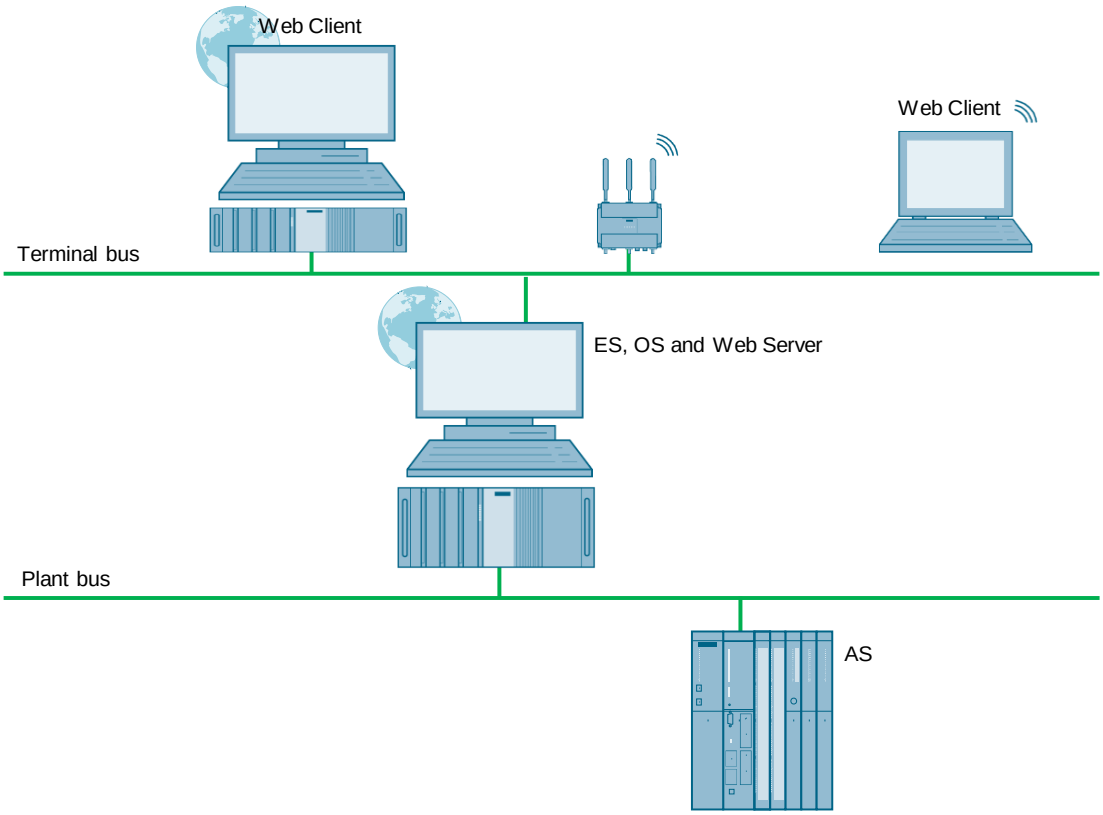
1) If quad Multi VGA is available, the number of monitors must be increased appropriately.

2) The number of POs can be increased later by means of extra volume licenses.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 4.2 Single-user station with PCS 7 Web Server

This configuration is a system in which the ES, OS, and PCS 7 Web Server are used on one PC as a single-user system.
The PCS 7 Web Clients are connected via the terminal bus.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station and Operator Station** | | | | |
| 1 | | 6ES7660-6DC10-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, MULTI MONITOR 2 SCREENS VIA ONBOARD INTERFACES (ADAPTER CABLE), BCE, PCS 7 V8.2 , WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| 1 | | 6ES7658-2HX28-2YB0 | SOFTWARE SIMATIC PCS 7 WEB DIAGNOSTICS SERVER V8.2 | 4) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **Wireless LAN** | | | | |
| 1 | | 6GK1907-0DC10-6AA3 | POWER M12 CABLE CONNECTOR PRO | 5) |
| 1 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 1)<br>2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **Web client system** | | | | |
| 2 | | 6ES7658-2JX28-2YB0 | SOFTWARE SIMATIC PCS 7 WEB DIAGNOSTICS CLIENT V8.2 | 4) |

**Note**

The laptop (web clients) hardware is not listed.

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) Wireless LAN access point with approval for the USA and Canada; approval for other countries requires a different version of W786-RJ45.

4) As an alternative to the Diagnostic licenses for servers and clients, server-based licensing can be selected for up to three web clients.

5) The selected cable is based on the architecture in which Access Point W786-1 RJ45 is powered by a separate 24V DC power source.

# 5 System with multiple OS single stations

### System with multiple OS single stations

Two to five users and typically up to 1000 inputs and outputs can be supported and controlled with one SIMATIC PCS 7 system composed of several single stations.

In an architecture like this, the system can consist of up to 8 single stations. The single stations are configured and loaded on a central basis from an Engineering Station (ES) in a single OS project. Since the entire database is copied to all the single stations, the entire plant can be controlled from one single location. It can be archived simultaneously on all the single stations. However, there is no synchronization between the single locations, and archives for alarms and tags run independently from each other.

### Redundancy

With linking of a Process Historian (PH), two OS single stations must be set up on a redundant basis; otherwise, the link does not function. Two OS single stations can be equipped with redundancy software and hardware components to create a highly available Operator Station. In this case, the archive synchronization is carried out between the redundant single stations. The terminal bus, system bus, automation system(s) (AS) and Fieldbus can also be set up on a redundant basis. This redundancy option for the OS is limited to two OS single stations.



### Configuration limits

OS single station configurations are intended for small- and medium-sized plants in the lower range. If more than two OS single stations are to be deployed, a client/server architecture is generally more economical.

By contrast with OS servers, OS single stations have the following restrictions:

- Released number: 8 OS single stations
- Max. number of process objects per OS single station: 8,500 POs
- Number of measuring points per OS single station approx. 4,500

### Dual Monitor

Each OS or ES can be expanded with a standard graphics card and an appropriate adapter cable such that it is possible to connect two monitors.

The systems can be expanded with a “4-screen" Multi VGA graphics card that makes it possible to connect up to four monitors to one system.

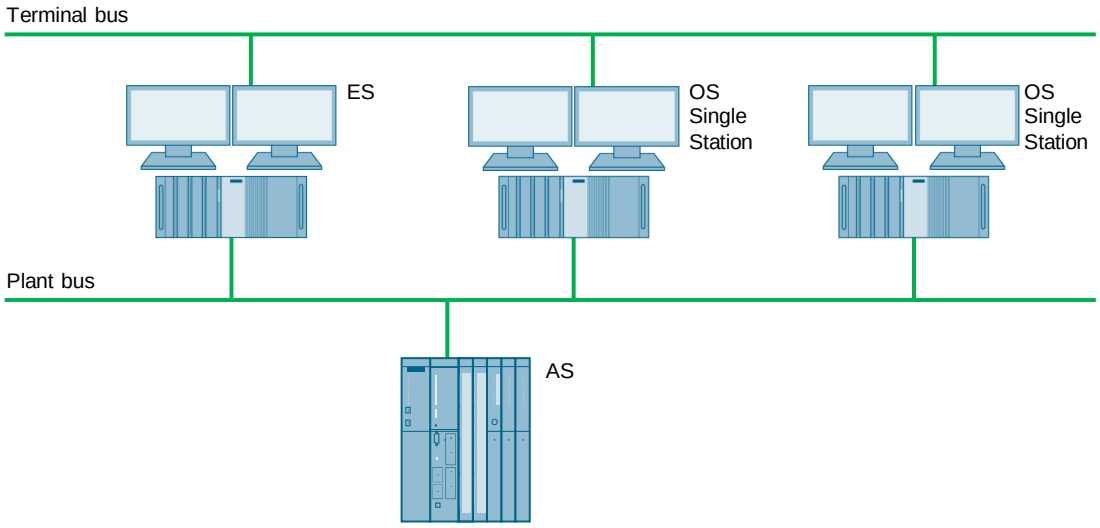
**Note**

For more than one redundant pair of OSs, neither archive synchronization nor redundancy for alarms and process variables between one another are available.

When connected with SIMATIC BATCH, there is a restriction that allows BATCH to be used on only one of the OS single stations. A separate project must be created for this OS single station.

## 5.1 Multiple OS single stations with dual monitor

In this configuration, the system has several OS Single Stations and one separate ES. The ES and the OS are each fitted with two monitors.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DC10-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, MULTI MONITOR 2 SCREENS VIA ONBOARD INTERFACES (ADAPTER CABLE), BCE, PCS 7 V8.2 , WIN 7 ULTIMATE 64BIT | 1) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Operator Station** | | | | |
| 2 | | 6ES7660-6DC10-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, MULTI MONITOR 2 SCREENS VIA ONBOARD INTERFACES (ADAPTER CABLE), BCE, PCS 7 V8.2 , WIN 7 ULTIMATE 64BIT | 1) |
| 2 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 2) |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 1 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

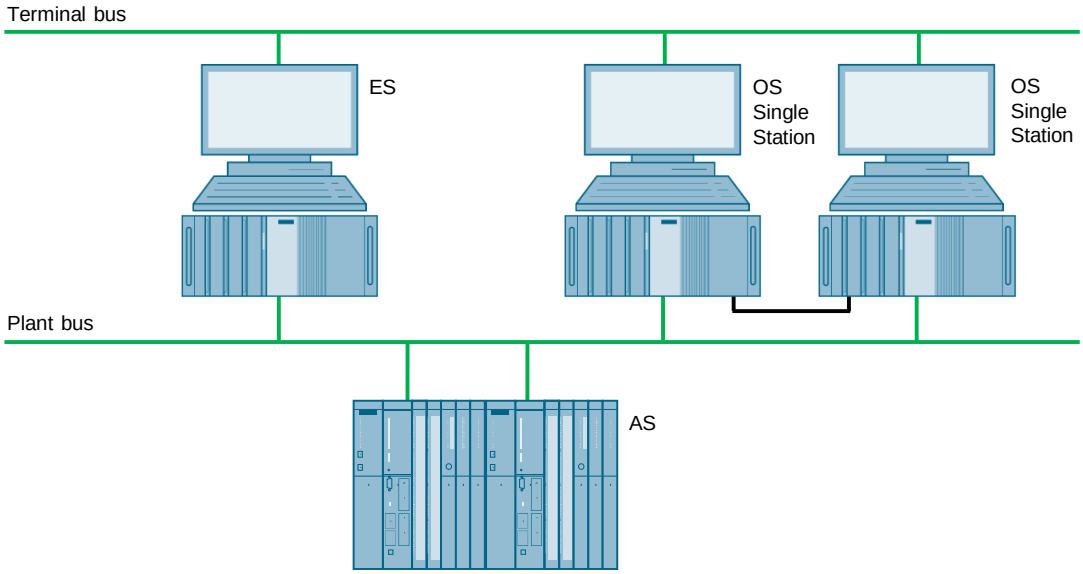
1) If quad Multi VGA is available, the number of monitors must be increased appropriately.

2) The number of POs can be increased later by means of extra volume licenses.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 5.2 Redundant OS single stations

In this configuration, the system has one redundant OS Single Station. The ES is configured on a separate PC. The terminal bus and the plant bus are set up on a redundant basis.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DC11-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6)<br>7)<br>8) |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Operator Station** | | | | |
| 2 | | 6ES7660-6DC11-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6ES7652-3AA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SINGLE STATION REDUNDANCY V8.2 (PO 100) | 2) 5) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6) 7) 8) |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 1 | | 6ES7656-6CL33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |



**Note**

1) Necessary if a redundant system bus is selected.

2) The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is selected.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) The redundant OS single station is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the PCs.

6) The onboard interfaces can be used.

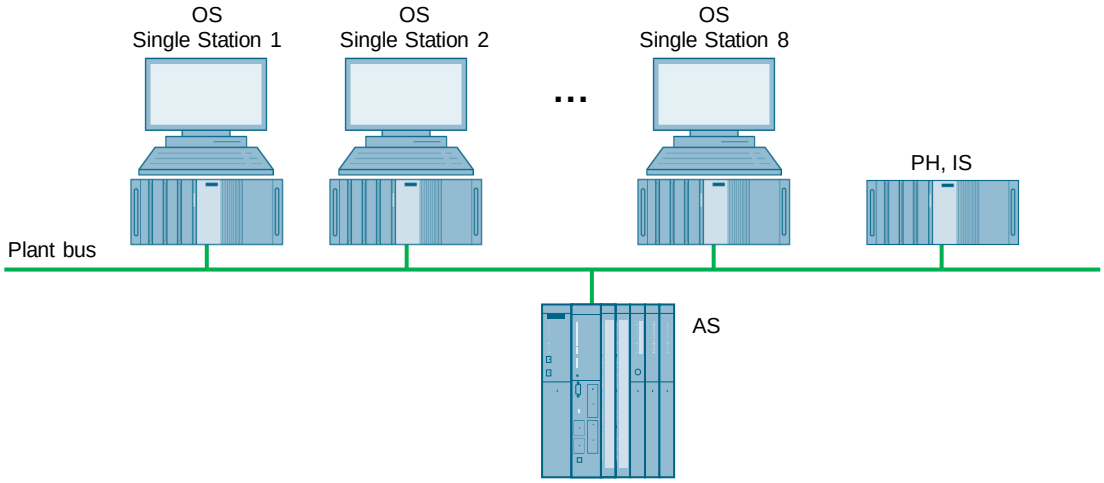
7) Single license for one installation.

8) Necessary if a redundant terminal bus is selected.

## 5.3 Plain system configuration without OS server

For small- and medium-sized plants, implementation is possible in a very plain system configuration without an OS server. In this case, OS single-user stations are used, and the number can be expanded up to a maximum of 8 single-user stations.

The usual separation in an OS server/OS client structure into a system and terminal bus does not take place. In this case, this means that each single-user station is connected directly to the AS.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HDD SATA, 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 2) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 4) |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Operator Station** | | | | |
| 3 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 3 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 2) |
| 1 | | 6ES7652-3AA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SINGLE STATION REDUNDANCY V8.2 (PO 100) | 3) 6) |
| | 3 | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 4) |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7656-6CN33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 5) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) 2) Necessary if a redundant bus is selected.

3) The number of POs can be increased later by means of extra volume licenses.

4) Necessary if a redundant bus or a redundant automation system is selected.

5) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

6) The redundant OS single station is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the PCs.

# 6 OS Client/OS Server system

### Client/server system

Medium to large systems can benefit greatly from the SIMATIC PCS 7 client/server architecture. The central administration of real-time and historical values, easy entry of application changes and cost reduction are all features of SIMATIC PCS 7 systems. The basic system of a client/server architecture is composed of an OS server and two or more OS clients. The ES has a connection to both the terminal bus and the plant bus, so that changes can be loaded both on the OSs and the ASs. If needed and there are no engineering tasks pending, the ES can be used as an OS client.

### Operation via server

If you operate no more than 4 OS clients on one OS server, you can use an OS server as an operator control and monitoring station.

### Redundancy

By using a redundant OS server pair (optional redundant Process Historian), SIMATIC PCS 7 can support redundancy at all levels. This means that OS clients accessing real-time/historical values and storage of historical data offer higher availability.

At the hardware level, the system supports redundant ring structures to ensure increased availability there too.



### Dual Monitor

OS clients can be expanded with a standard graphics card and an appropriate adapter cable such that it is possible to connect two monitors.

The systems can be expanded with a “4-screen" Multi VGA graphics card that makes it possible to connect up to four monitors to one system.

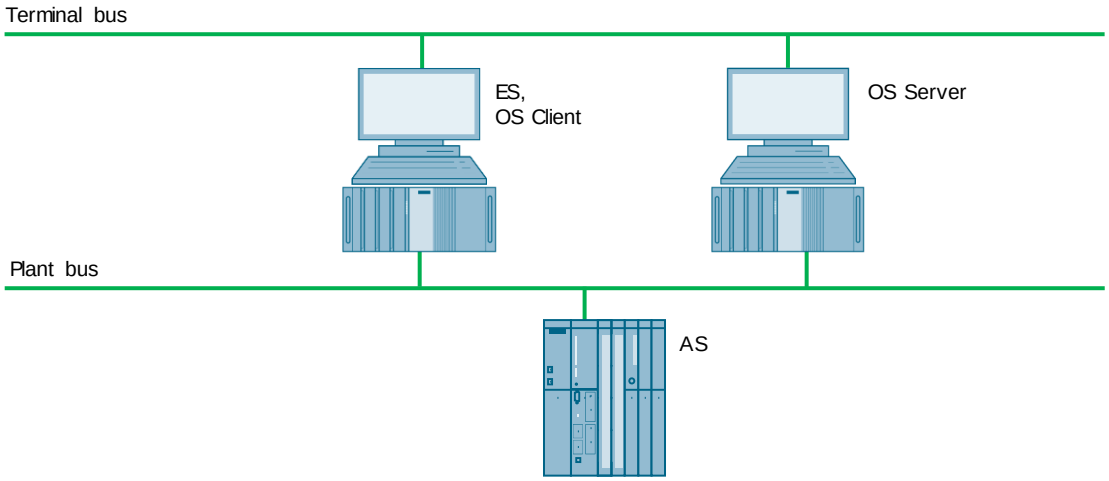
### Web Server

A dedicated OS client can be equipped with the SIMATIC PCS 7 Web server software, which makes possible operator control and monitoring of up to 100 web clients via the Internet/Intranet. Server licensing allows more than 100 users to access one web server at the same time.

**Note** One OS server supports up to 40 OS clients.

## 6.1 OS Client/OS Server with operator control and monitoring on the ES and OS Server

This configuration is a system in which the ES and OS client are used on one PC. The OS Server is configured on a separate PC.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | 2) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Operator Station** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 1 | | 6ES7654-6CP03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSIONS CARD 1600 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

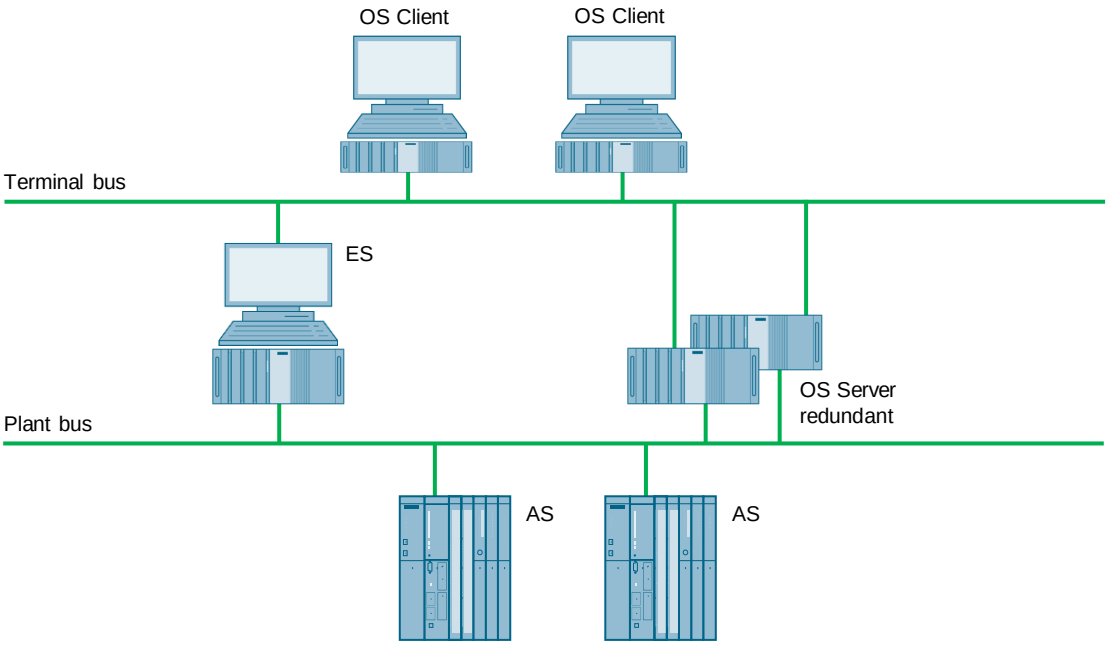
1) The number of POs can be increased later by means of extra volume licenses.

2) The maximum number of OS clients when operating on the OS server is three. One OS client client with dual monitor is equivalent to 2 OS clients. A maximum of 4 monitors can be controlled from an OS server with operator input.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 6.2 OS client/OS server operation on a redundant server architecture

In this configuration, the system has one redundant OS server pair, two OS clients and one separate ES. Both OS servers are designed as operator control and monitoring stations.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V7.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 2 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 1) 4) |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | 2) |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |



**Note**

1) The number of POs can be increased later by means of extra volume licenses.

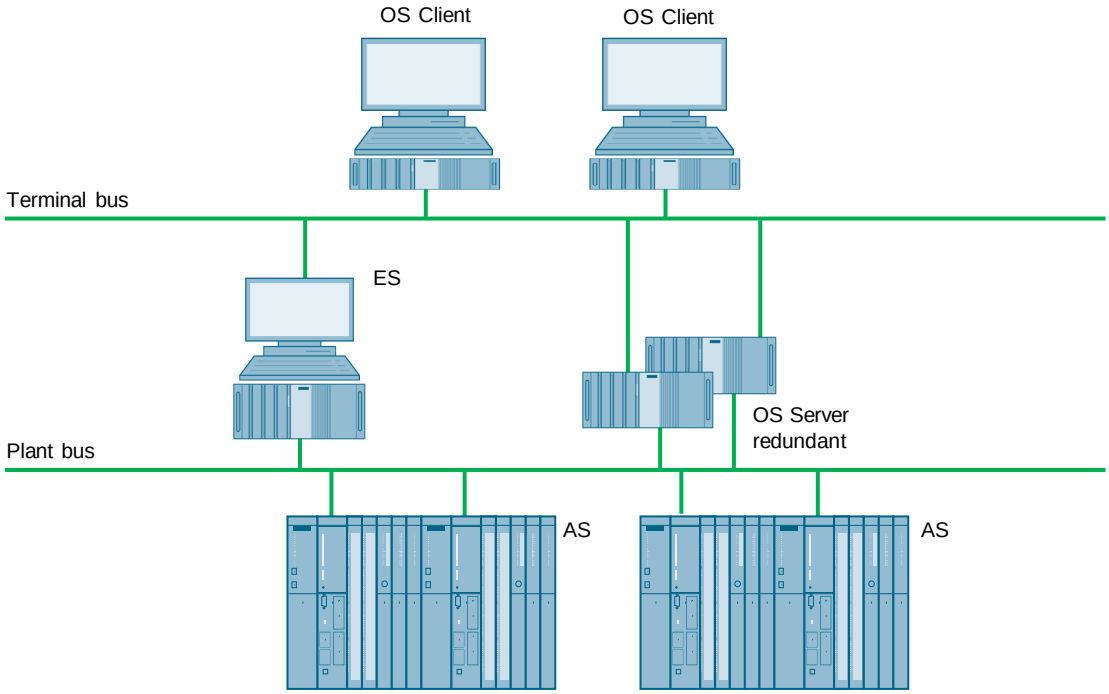
2) The maximum number of OS clients with operator input on the redundant OS Server is two. One OS client client with dual monitor is equivalent to 2 OS clients.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

4) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

## 6.3 Redundant OS Client/OS Server system

In this configuration, the system has one redundant OS server pair, two OS clients and one separate ES. The terminal bus and the plant bus are also set up on a redundant basis.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6)<br>7)<br>8) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) 5) |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6) 7) 8) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6) 7) 8) |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CN33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Necessary if a redundant system bus is chosen

2)The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is chosen.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

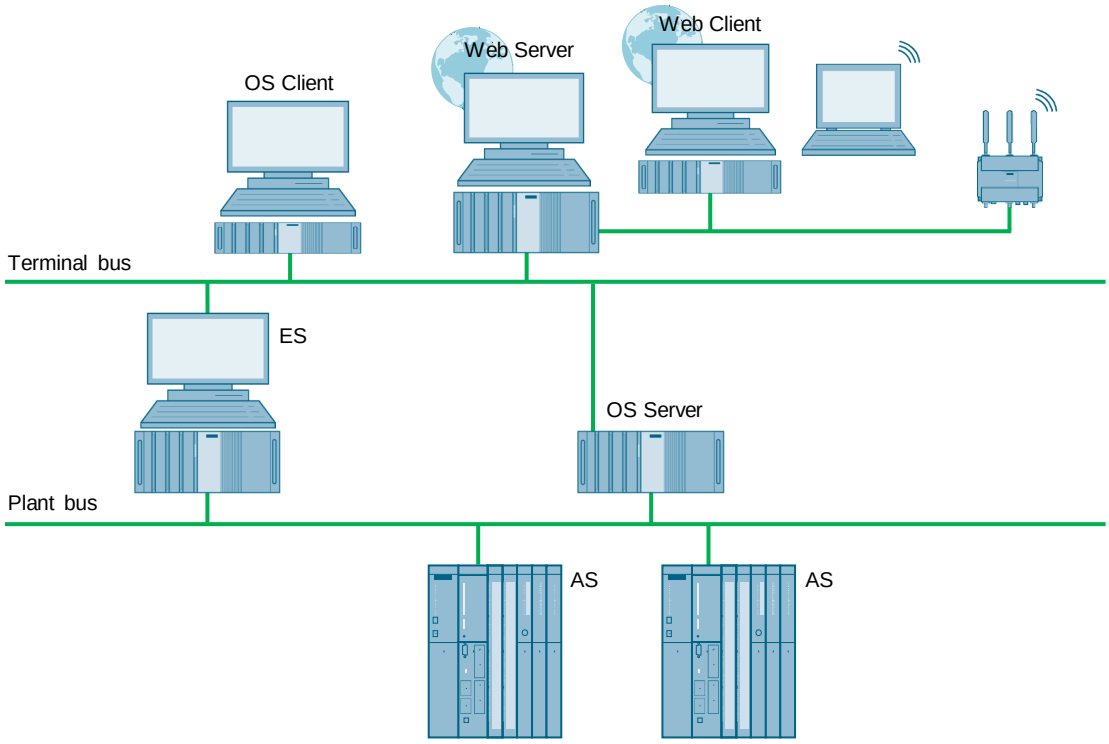
6) The onboard interfaces can be used.

7) Single license for one installation.

8) Necessary if a redundant terminal bus is selected.

## 6.4 OS Client/OS Server system with a PCS 7 Web Server

In this configuration, the system has one redundant OS server, one OS client and one separate ES. The PCS 7 Web Server is configured on a separate PC. The PCS 7 Web Clients have separate network access to the PCS 7 Web Server.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| **OS client** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Web Server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 1 | | 6ES7658-2GX28-2YB0 | SOFTWARE SIMATIC PCS 7 WEB SERVER BASIC V8.2 | |
| 1 | | 6ES7658-2GF00-0XB0 | SOFTWARE SIMATIC PCS 7 WEB SERVER (5 CLIENTS) | 2) |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

Laptops that are used as web clients are not listed. Wireless LAN that is used for laptop connection is not listed.

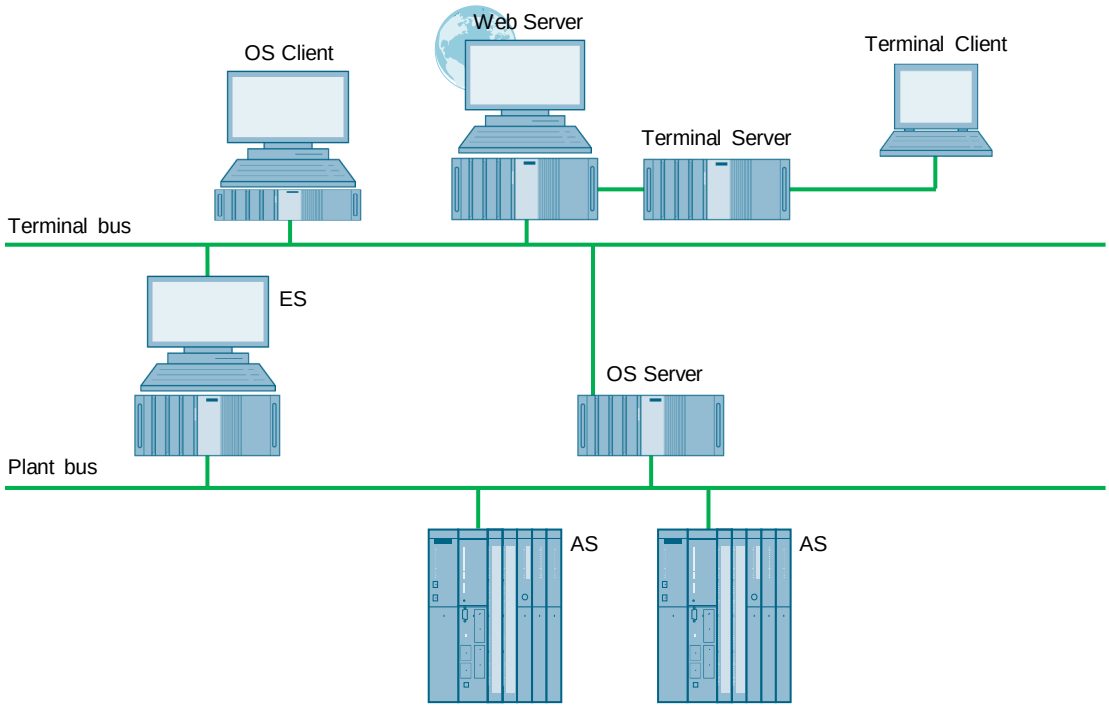
1) The number of POs can be increased later by means of extra volume licenses.

2) The number of web clients can be increased later on by means of cumulative web server licenses.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 6.5 OS Client/OS Server system with terminal server

In this configuration, the system has one redundant OS server, one OS client and one separate ES. The PCS 7 Web Server and the terminal server are each configured on a separate PC.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| **OS client** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Web Server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 1 | | 6ES7658-2GX28-2YB0 | SOFTWARE SIMATIC PCS 7 WEB SERVER BASIC V8.2 | |
| 1 | | 6ES7658-2GF00-0XB0 | SOFTWARE SIMATIC PCS 7 WEB SERVER (5 CLIENTS) | 2) |
| **Terminal Server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT<br>A Microsoft terminal server and a Web client are installed on this computer. | 2) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

Laptops that are used as terminal clients are not listed. Wireless LAN that is used for laptop connection is not listed.

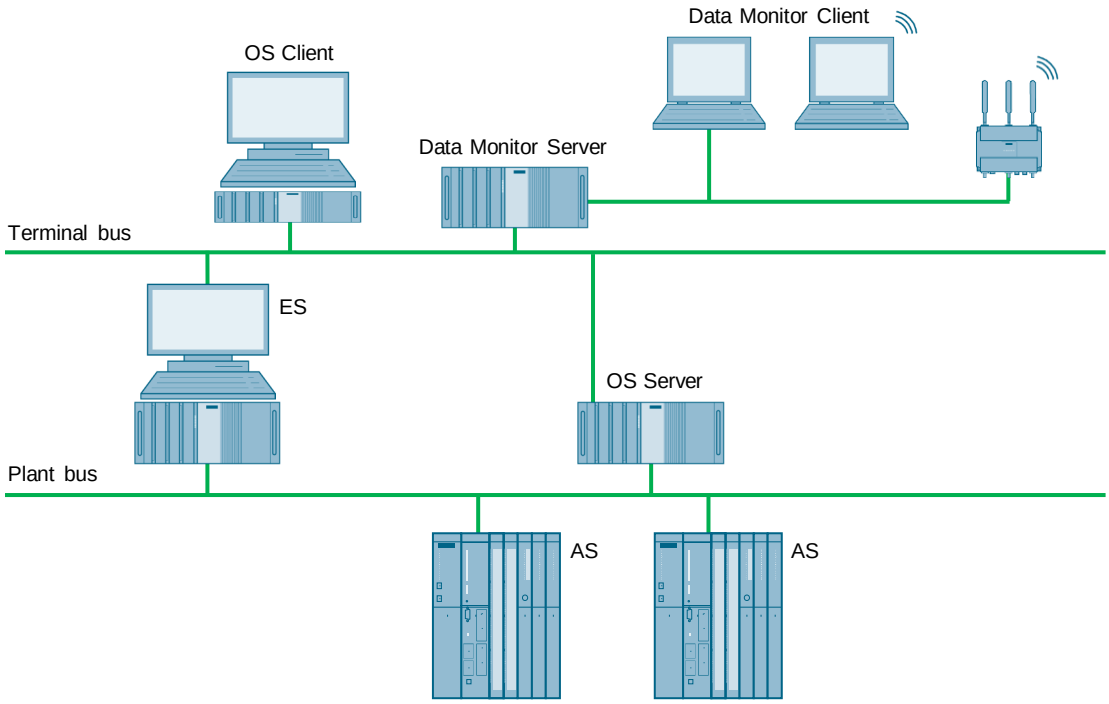
1) The number of POs can be increased later by means of extra volume licenses.

2) The number of terminal clients can be increased by means of POWERPACKs.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 6.6 OS Client/OS Server system with DataMonitor server

In this configuration, the system has one redundant OS server, one OS client and one separate ES. The DataMonitor Server is configured on a separate PC. The DataMonitor Clients have access to the DataMonitor Server via a separate network.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| **OS client** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **DataMonitor Server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | 2) |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 1 | | 6AV6362-3AD00-0BB0 | WINCC/DATAMONITOR, 3 CLIENT LICENCES (COUNTABLE), RUNTIME-SW | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

Laptops that are used as DataMonitoring clients are not listed. Wireless LAN that is used for laptop connection is not listed.

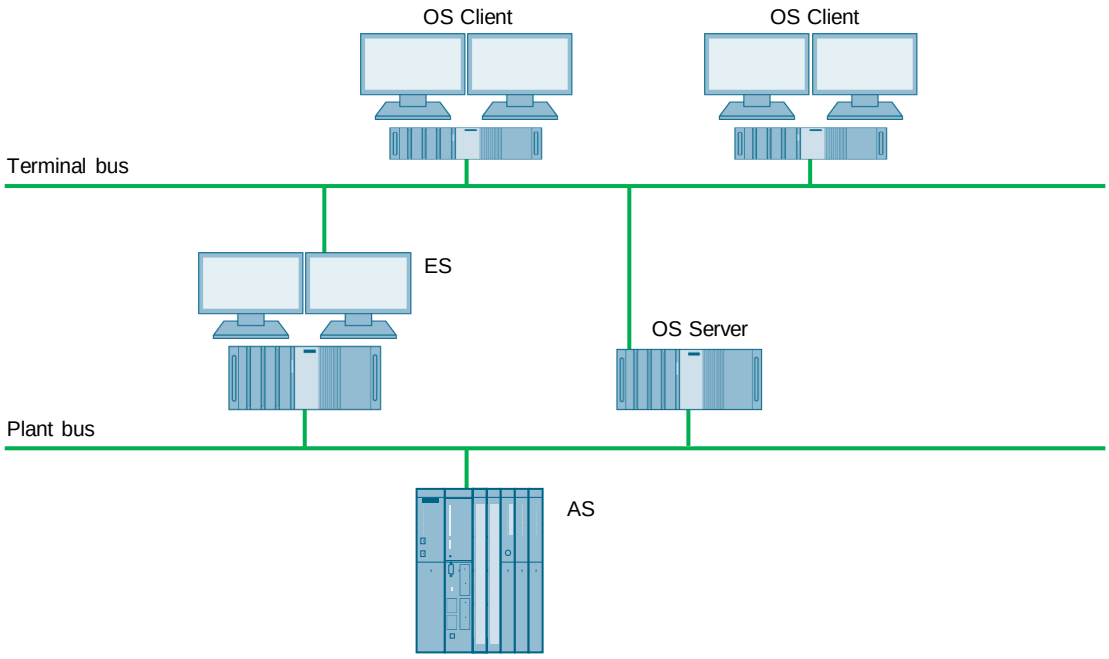
1) The number of POs can be increased later by means of extra volume licenses.

2) Installation of the DataMonitor server:
- Restore DVD (Windows Server 2012 R2)
- DataMonitor Server software
- OS Client and DataMonitor Server licenses

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 6.7 OS Client/OS Server with dual monitor

In this configuration, the system has one OS server, two OS clients and one separate ES. The ES and the OS clients are each fitted with two monitors.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DC10-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, MULTI MONITOR 2 SCREENS VIA ONBOARD INTERFACES (ADAPTER CABLE), BCE, PCS 7 V8.2 , WIN 7 ULTIMATE 64BIT | 1) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 2) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AB0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HDD SATA, 4GB DDR3, MULTI MONITOR 2 SCREENS VIA ONBOARD INTERFACES (ADAPTER CABLE), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | 1) |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |



**Note**

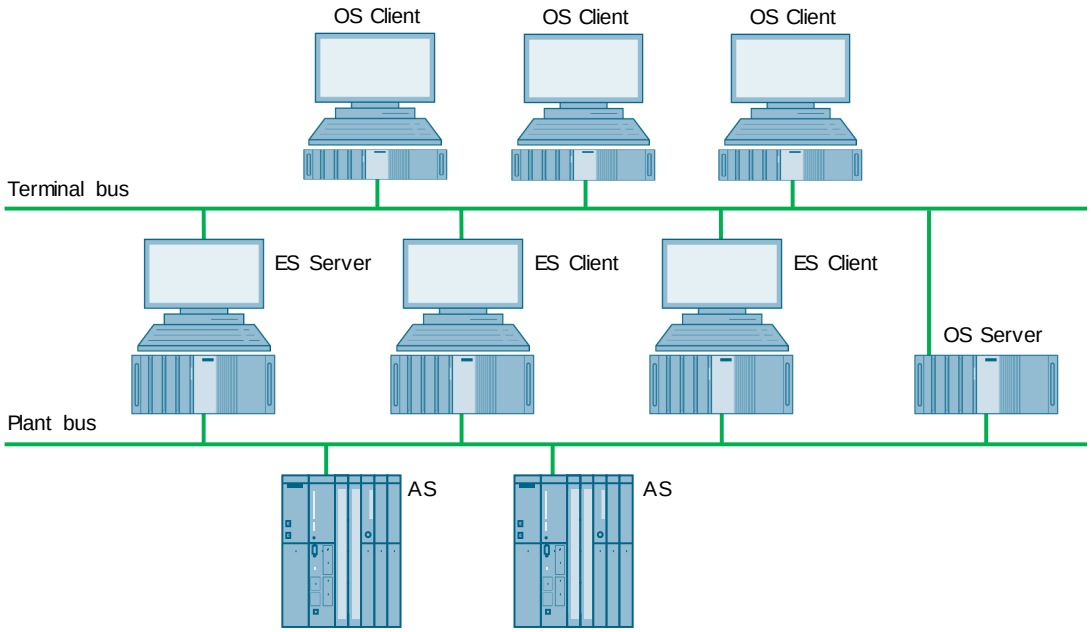
1) If quad Multi VGA is available, the number of monitors must be increased appropriately.

2) The number of POs can be increased later by means of extra volume licenses.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 6.8 OS Client/OS Server system with multiuser engineering

In this configuration, the system has one OS server and three OS clients. One ES Server and two ES Clients guarantee multiuser engineering.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **ES server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **ES client** | | | | |
| 2 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

# 7 Multi-server

**Multi-server system**

In large systems, the multi-server architecture of SIMATIC PCS 7 enables the use of large distributed systems. In this case, several OS servers are used on a single or redundant basis to supply a large number of OS clients with real-time and historical values.

If needed and there are no engineering tasks pending, the ES can be used as an OS client.

**Redundant bus**

The availability of the connection between the OS servers and the AS as well as between the OS servers and OS clients can be increased using redundant interfaces and network components.

**Note**

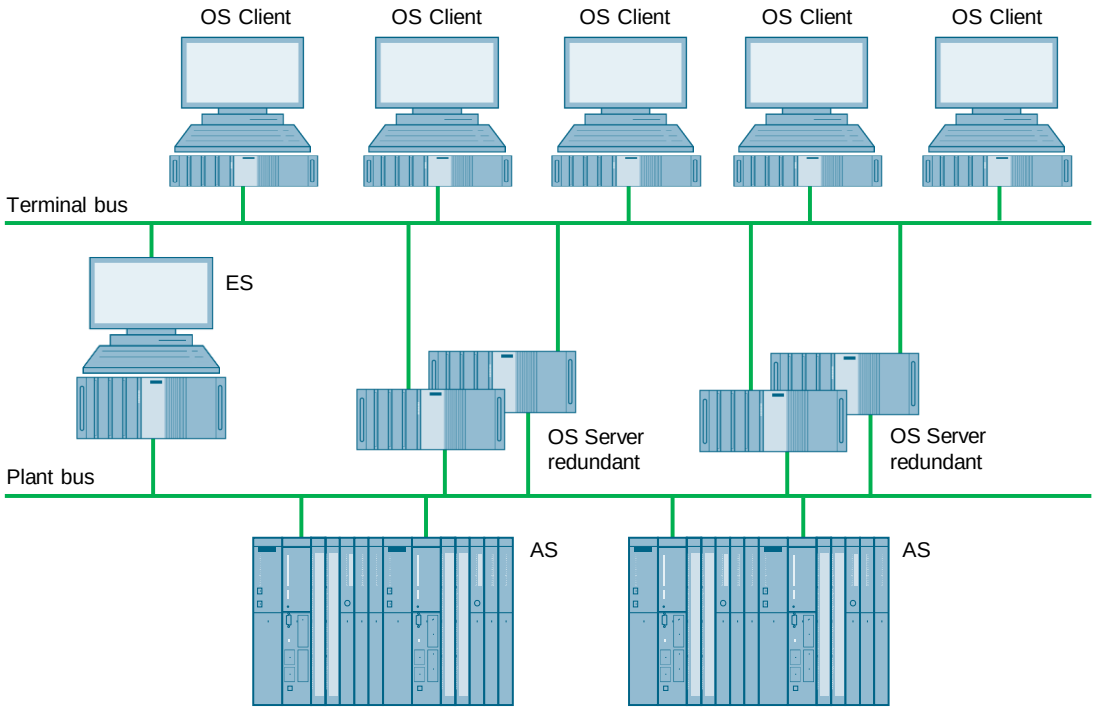
One OS server supports up to 40 OS clients.

The number of OS clients in the system can be greater than 40 but each individual OS server supports a maximum of 40 OS clients.

The maximum number of OS servers in a system is 18; one OS client can be connected to a maximum of 18 OS servers.

## 7.1 Multi-server single-bus architecture

In this configuration, the system has two redundant OS server pairs, five OS clients and one separate ES.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 4 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 4 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 2 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) 4) |
| **OS client** | | | | |
| 5 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 5 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 5 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7656-6CQ33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 2k+ PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |



**Note**

1) Required for redundant automation systems.

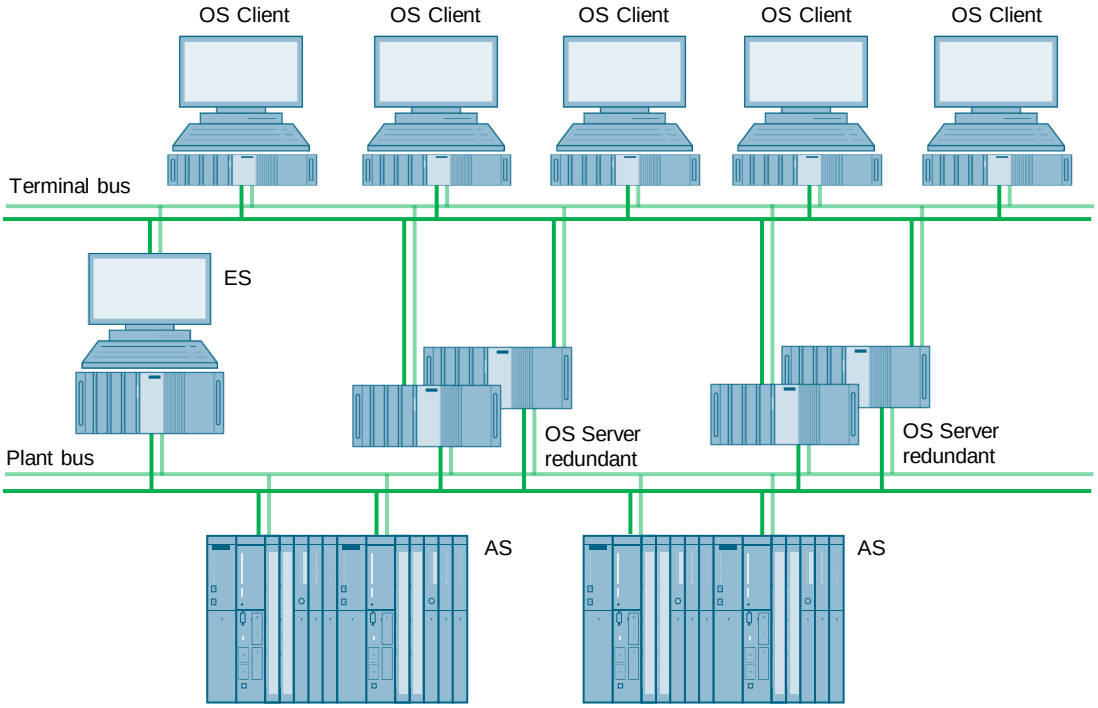
2) The number of POs can be increased later by means of extra volume licenses.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

4) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

## 7.2 Redundant multi-server bus architecture

In this configuration, the system has two redundant OS server pairs, five OS clients and one separate ES. The terminal bus and the plant bus are also set up on a redundant basis.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 4) 5) |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **OS server** | | | | |
| 4 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 4 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | |
| 4 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | |
| 4 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 4) 5) |
| 2 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 1) 3) |
| **OS client** | | | | |
| 5 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 5 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 4) 5) |
| 5 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 5 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CQ34-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 2K+ PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X 2 CP443-1 | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

4) The onboard interfaces can be used.

5) Single license for one installation.

# 8 SIMATIC BATCH

### SIMATIC BATCH

SIMATIC BATCH is the SIMATIC PCS 7 standard software for ISA-88 recipe management and batch management. SIMATIC BATCH is based on a scalable modular software that can be used in all SIMATIC PCS 7 architectures.

SIMATIC BATCH uses a standard client/server architecture with clients for recipe editing and batch control. SIMATIC Batch clients can be installed on SIMATIC PCS 7 single-user systems, server/client systems and PCs on which no further SIMATIC PCS 7 software is available.

### Starter system

The smallest system that supports SIMATIC BATCH is the single-user station architecture. All the functions, engineering, operation, and batch controls are installed on one single PC. The batch functions and operations are performed in the automation system.

### Client/server

Mid-sized systems that support multiple users and do not need redundancy are implemented as client/server systems. SIMATIC BATCH follows the Operator station architecture seamlessly by distributing the BATCH server and client applications on the corresponding Operator station PCs.

### Redundant client/server

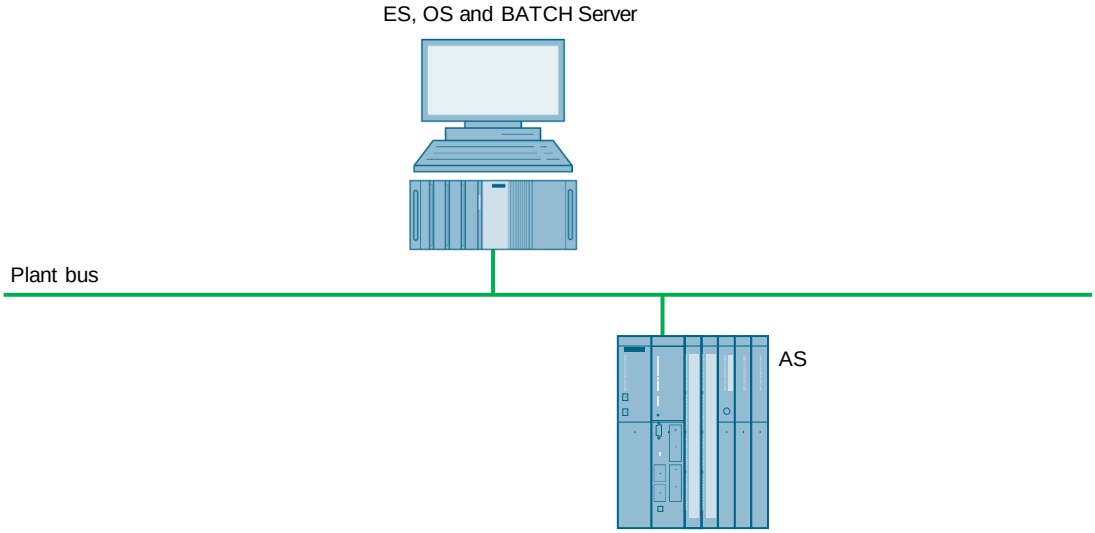
When redundancy is required and the number of servers must be kept as low as possible, SIMATIC BATCH makes possible operation of a redundant BATCH server based on the redundant OS server pair PCs.

### Redundant client/multi-server

When it comes to large, high-performance applications, the SIMATIC PCS 7 client/server architecture allows the distribution of applications across multiple PCs. In this case, the BATCH server and the OS server run on two independent PCs. Each of them can be implemented on a redundant basis, which makes possible very high availability levels. The OS client client PCs can run the BATCH client application and access both the OS server and the BATCH server. If necessary, the OS client and the BATCH client application can run on separate PCs too.

## 8.1 SIMATIC BATCH single-user system

This configuration is a system in which the ES, OS, and BATCH server are used on one PC as a single-user system.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, Operator Station, and BATCH Server** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| 1 | | 6ES7657-0UX28-0YB0 | SOFTWARE SIMATIC BATCH SINGLE STATION PACKAGE V8.2 | |
| 1 | | 6ES7657-0XA00-0YB0 | SOFTWARE SIMATIC BATCH (1 UNIT) | 3) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

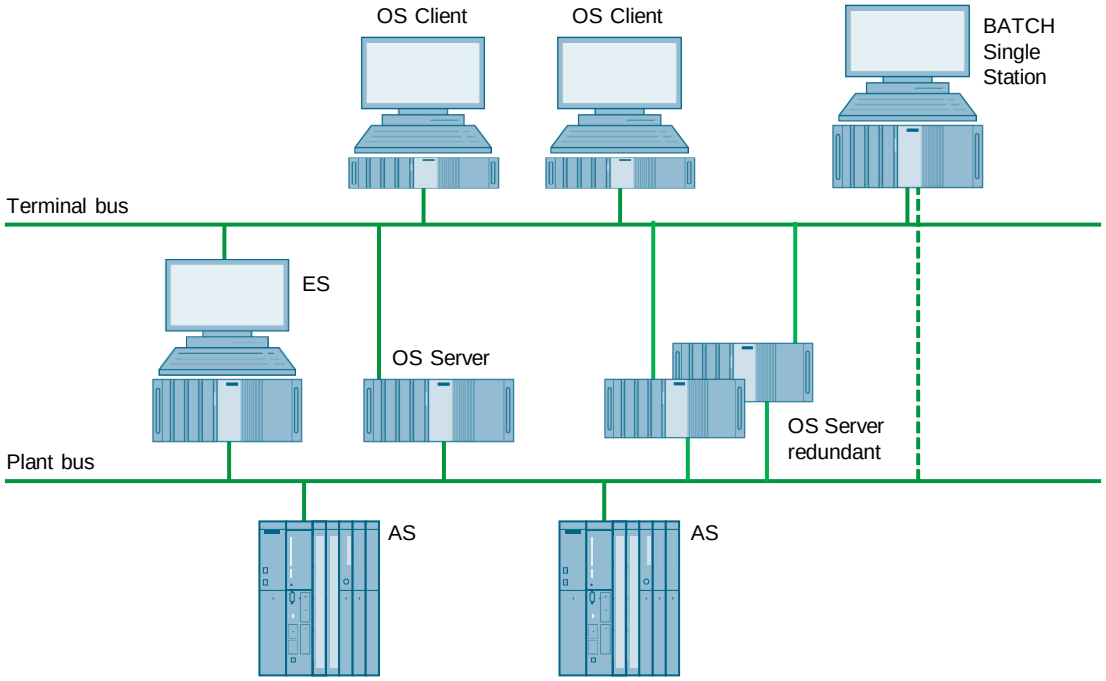
1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of batch units can be increased by means of cumulative batch unit licenses.

## 8.2 SIMATIC BATCH single-user system in an OS client/OS server architecture

In this configuration, the system has two OS clients and two OS servers.
The BATCH Single Station is configured as a single-user system on a separate PC.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SOFTWARE SERVER V8.2 (PO 100) | 1) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **BATCH Single Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7657-0UX28-0YB0 | SOFTWARE SIMATIC BATCH SINGLE STATION PACKAGE V8.2 | |
| 1 | | 6ES7657-0XA00-0YB0 | SOFTWARE SIMATIC BATCH (1 UNIT) | 3) |

**Note**

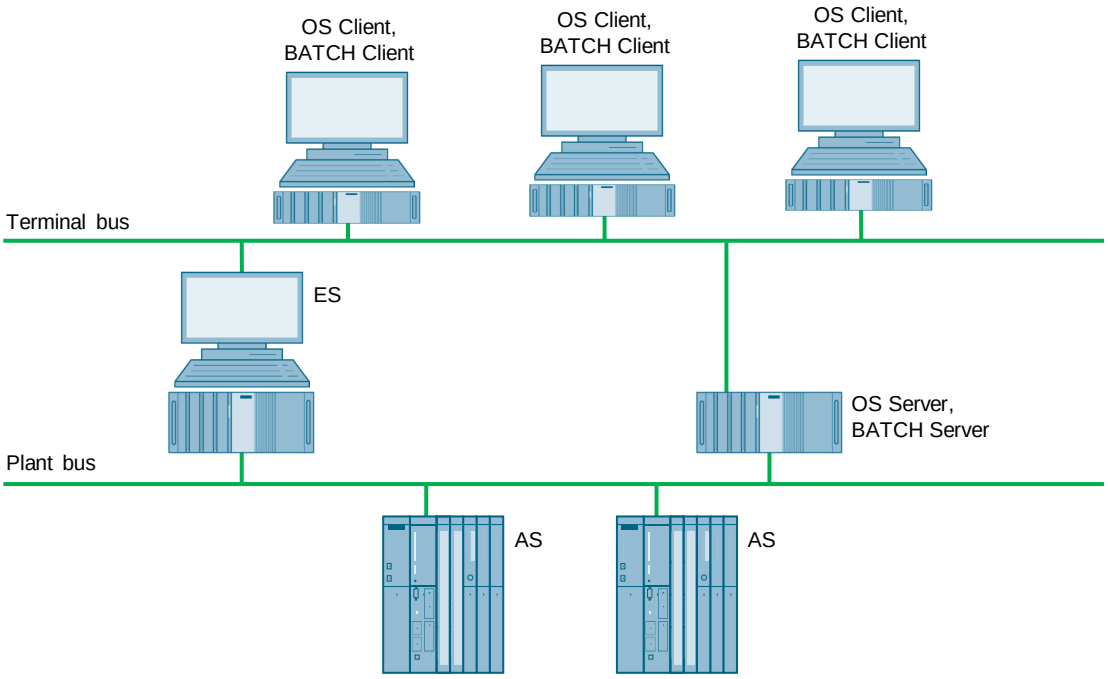
1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of batch units can be increased by means of cumulative batch unit licenses.

## 8.3 SIMATIC BATCH OS Client/OS Server

In this configuration, the system has three BATCH clients and one separate ES. The OS Server and the BATCH server are integrated on one PC.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server, BATCH server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS-SERVER V8.2 (PO 100) | 1) |
| 1 | | 6ES7657-0TX28-0YB0 | SOFTWARE SIMATIC BATCH SERVER V8.2 | |
| 1 | | 6ES7657-0XB00-0YB0 | SOFTWARE SIMATIC BATCH (10 UNITS) | 3) |
| **OS client, BATCH client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| 3 | | 6ES7657-0VX28-0YB5 | SOFTWARE SIMATIC BATCH CLIENT V8.2 | |
| 1 | 2 | 6ES7657-0AX28-0YB5 | SOFTWARE SIMATIC BATCH RECIPE SYSTEM V8.2 | 4) |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

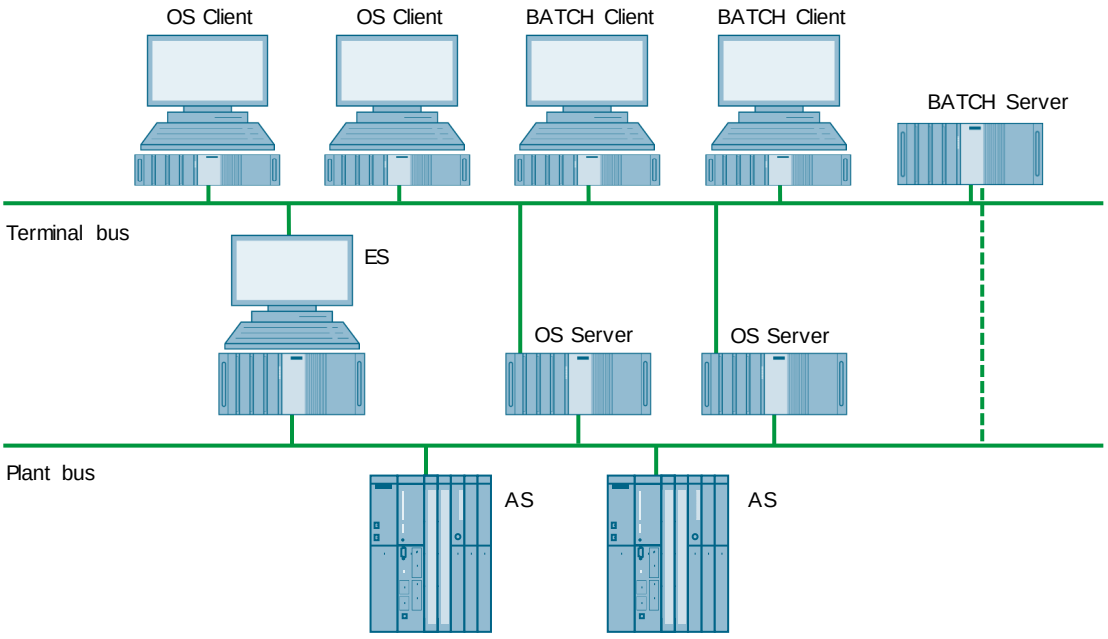
2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of batch units can be increased by means of cumulative batch unit licenses.

4) The SIMATIC BATCH recipe system license is needed on at least one of the clients in a client/server system (on all the clients that are to be used to create and edit recipes).

## 8.4 Separate SIMATIC BATCH server

In this configuration, the system has two OS clients, two BATCH clients, and two OS servers. The BATCH Server is configured on a separate PC.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 2 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 2 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| **Batch server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7657-0TX28-0YB0 | SOFTWARE SIMATIC BATCH SERVER V8.2 | |
| 1 | | 6ES7657-0XB00-0YB0 | SOFTWARE SIMATIC BATCH (10 UNITS) | 3) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **BATCH client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7657-0VX28-0YB5 | SOFTWARE SIMATIC BATCH CLIENT V8.2 | |
| 1 | 1 | 6ES7657-0AX28-0YB5 | SOFTWARE SIMATIC BATCH RECIPE SYSTEM V8.2 | 4) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

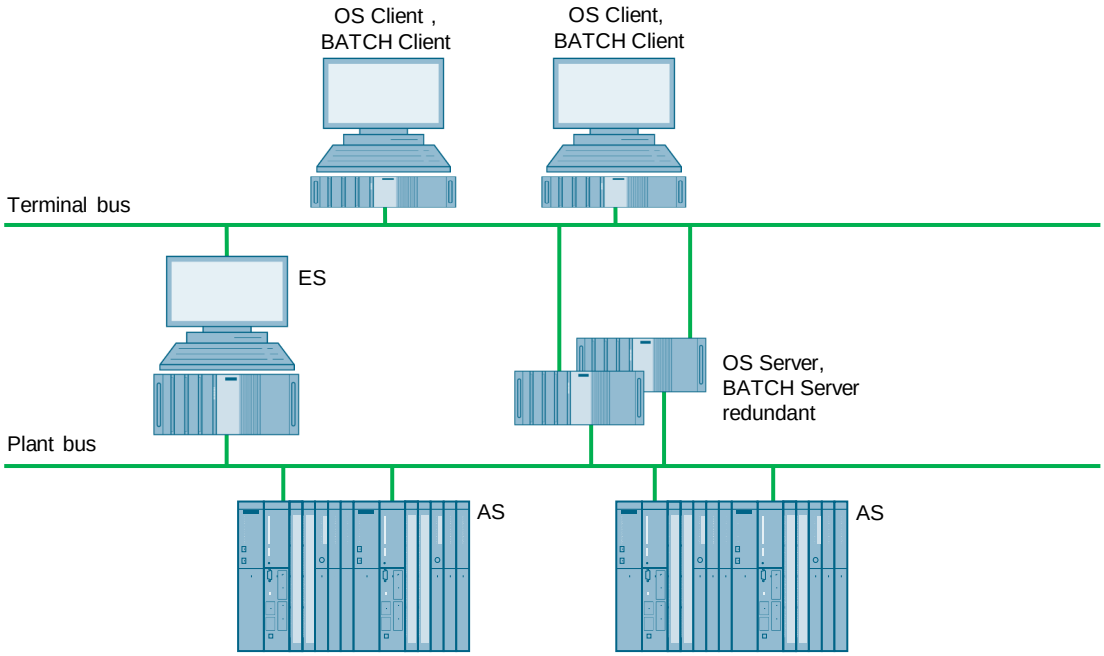
2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of batch units can be increased by means of cumulative batch unit licenses.

4) The SIMATIC BATCH recipe system license is needed on at least one of the clients in a client/server system (on all the clients that are to be used to create and edit recipes).

## 8.5 Redundant SIMATIC BATCH client/server-architecture

In this configuration, the system has one redundant BATCH server pair and two BATCH clients. The ES is configured on a separate PC. The terminal bus and the plant bus are also set up on a redundant basis.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF21-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16 GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server, BATCH server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |
| 2 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 6) |
| 1 | | 6XV1870-3RH60 | SIMATIC NET INDUSTRIAL ETHERNET TP XP CORD RJ45/RJ45, 6M | |
| 2 | | 6ES7657-0TX28-0YB0 | SOFTWARE SIMATIC BATCH SERVER V8.2 | |
| 2 | | 6ES7657-0XB00-0YB0 | SOFTWARE SIMATIC BATCH (10 UNITS) | 5) |
| **OS client, BATCH client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| 2 | | 6ES7657-0VX28-0YB5 | SOFTWARE SIMATIC BATCH CLIENT V8.2 | |
| 1 | 1 | 6ES7657-0AX28-0YB5 | SOFTWARE SIMATIC BATCH RECIPE SYSTEM V8.2 | 7) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CN33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Needed if a redundant system bus is chosen.

2) The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is chosen.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) The number of BATCH units can be increased by means of cumulative BATCH unit licenses.

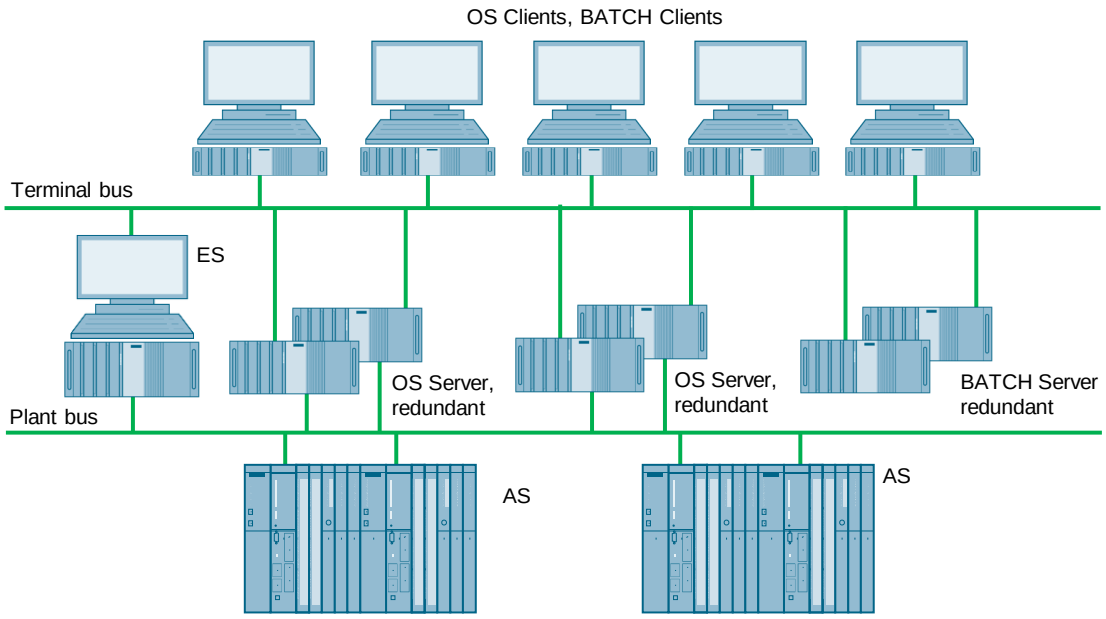
6) Additional network cards are required for redundancy switching.

7) The SIMATIC BATCH recipe system license is needed on at least one of the clients in a client/server system (on all the clients that are to be used to create and edit recipes).

8) The onboard interfaces can be used.
Single License for one installation.
Necessary if a redundant terminal bus is selected.

## 8.6 SIMATIC BATCH multi-server

In this configuration, the system has one redundant BATCH server pair and two redundant OS server pairs.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 4 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 4 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 2 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) 7) |
| **Batch server** | | | | |
| 2 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 2 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 5) |
| 1 | | 6XV1870-3RH60 | SIMATIC NET INDUSTRIAL ETHERNET TP XP CORD RJ45/RJ45, 6M | |
| 2 | | 6ES7657-0TX28-0YB0 | SOFTWARE SIMATIC BATCH SERVER V8.2 | |
| 2 | | 6ES7657-0XB00-0YB0 | SOFTWARE SIMATIC BATCH (10 UNITS) | 4) |
| **OS client, BATCH client** | | | | |
| 5 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 5 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 5 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| 2 | 3 | 6ES7657-0VX28-0YB5 | SOFTWARE SIMATIC BATCH CLIENT V8.2 | |
| 1 | 4 | 6ES7657-0AX28-0YB5 | SOFTWARE SIMATIC BATCH RECIPE SYSTEM V8.2 | 6) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CQ33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 2k+ PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Needed for a redundant automation system.

2) The number of POs can be increased later by means of extra volume licenses.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

4) The number of BATCH units can be increased by means of cumulative BATCH unit licenses.

5) The second network card is used for redundancy switching.

6) The SIMATIC BATCH recipe system license is needed on at least one of the clients in a client/server system (on all the clients that are to be used to create and edit recipes).

7) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

# 9 SIMATIC Route Control

### SIMATIC Route Control

SIMATIC Route Control is an optional package of the SIMATIC PCS 7 process control system and is integrated into the PCS 7 engineering and runtime system. Route Control is a system for automatic or manual control of material transport (routes) in process plants.

Simple transport processes right up to comprehensive route combinations are possible at runtime. Plant operators only need to specify the source and target locations for the route request. Route Control allows users to determine, check, control and monitor transport routes and the route elements they contain.

### Starter system

The smallest system that supports all SIMATIC Route Control functions is the Single Station. Route Control engineering, server, client and the functionality of the automation system are all concentrated on one PC and run in-parallel with the Operator station.

### Client/server

Mid-sized systems that support multiple users and require no redundancy are implemented as client/server systems. SIMATIC Route Control scales seamlessly to the Operator station architecture by distributing the Route Control server and client applications on the corresponding Operator station PCs.

### Redundant client/server

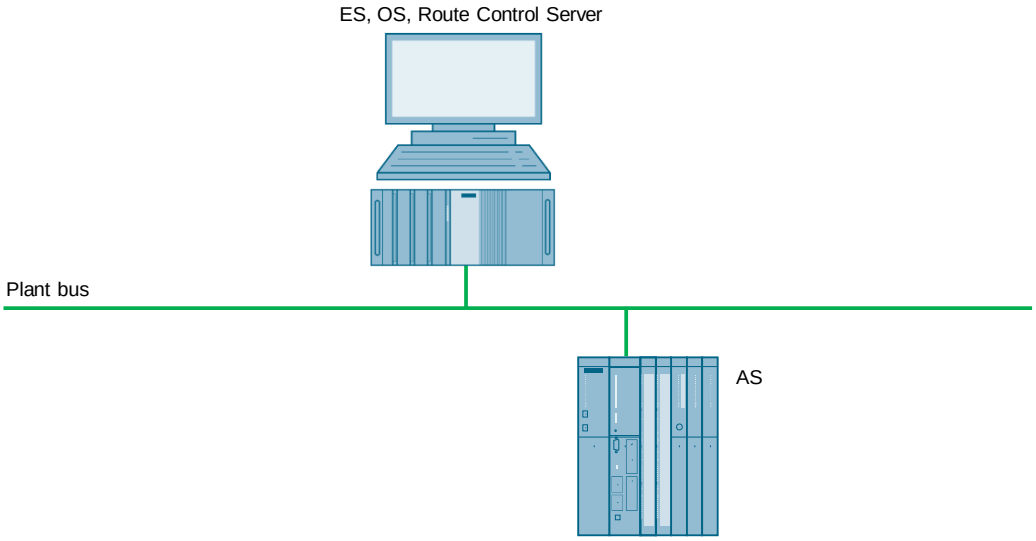
When redundancy is required and the number of servers must be kept as small as possible, SIMATIC Route Control allows the use of a redundant Route Control server based on the redundant server pair.

### Redundant client/multi-server

For large and high-performance applications, the SIMATIC PCS 7 client/server architecture allows the distribution of applications across multiple PCs. In this case, the Route Control server and the OS server run on two independent PCs. Each of them can be configured redundantly, which achieves very high availability. The OS client PCs can access both the OS server and the Route Control server. If necessary, both the OS client and the Route Control client application can run on separate PCs.

## 9.1 SIMATIC Route Control single-usersystem

This configuration is a system in which the ES, OS, and Route Control Server are used on one PC as a single-user system.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, Operator Station, and Route Control Server** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6ES7658-7DX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL ENGINEERING V8.2 | |
| 1 | | 6ES7658-7FX28-0YB0 | SOFTWARE SIMATIC ROUTE CONTROL SERVER V8.2 | |
| 1 | | 6ES7658-7FF00-0XB0 | SOFTWARE SIMATIC ROUTE CONTROL (10 ROUTES) | 3) |
| 1 | | 6ES7658-7EX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL CENTER V8.2 | |
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

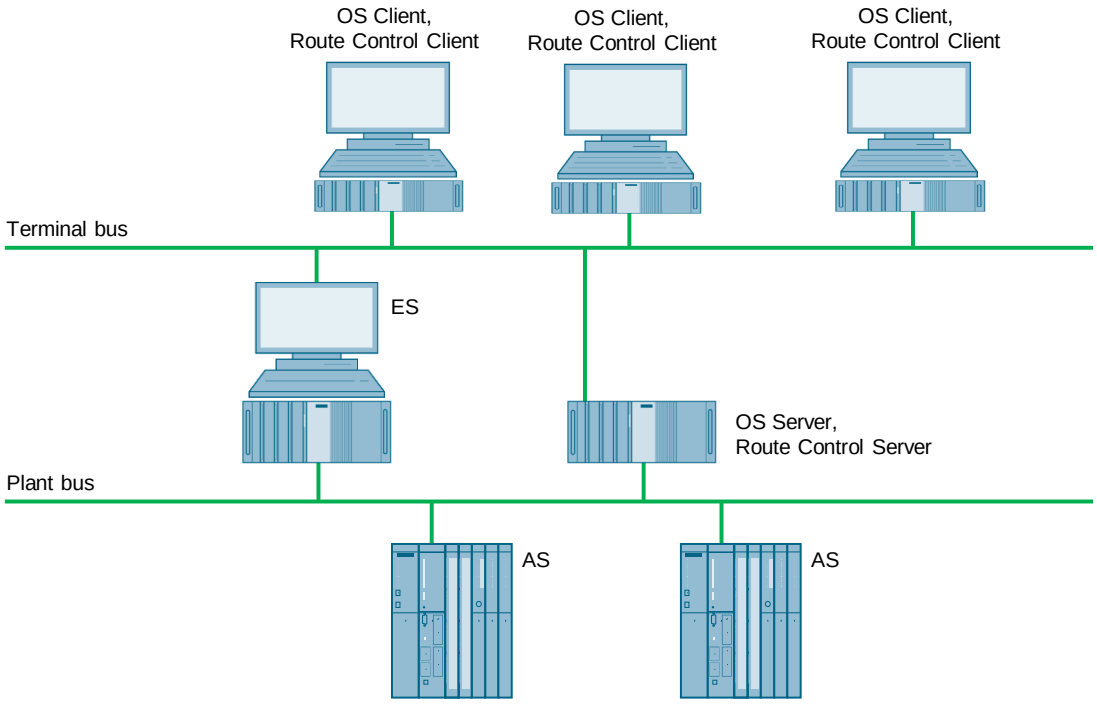
1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) At least one SIMATIC Route Control Routes license (for sets of 10/50) is required per project. The number of routes can be increased at a later stage with cumulative SIMATIC Route Control Routes licenses.

## 9.2 SIMATIC Route Control client/Server architecture

In this configuration, the system has three Route Control clients and one separate ES. The OS servers and the Route Control servers are integrated on one PC.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6ES7658-7DX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server, Route Control server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| 1 | | 6ES7658-7FX28-0YB0 | SOFTWARE SIMATIC ROUTE CONTROL SERVER V8.2 | |
| 1 | | 6ES7658-7FF00-0XB0 | SOFTWARE SIMATIC ROUTE CONTROL (10 ROUTES) | 3) |
| **OS client, Route Control client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| 3 | | 6ES7658-7EX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL CENTER V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

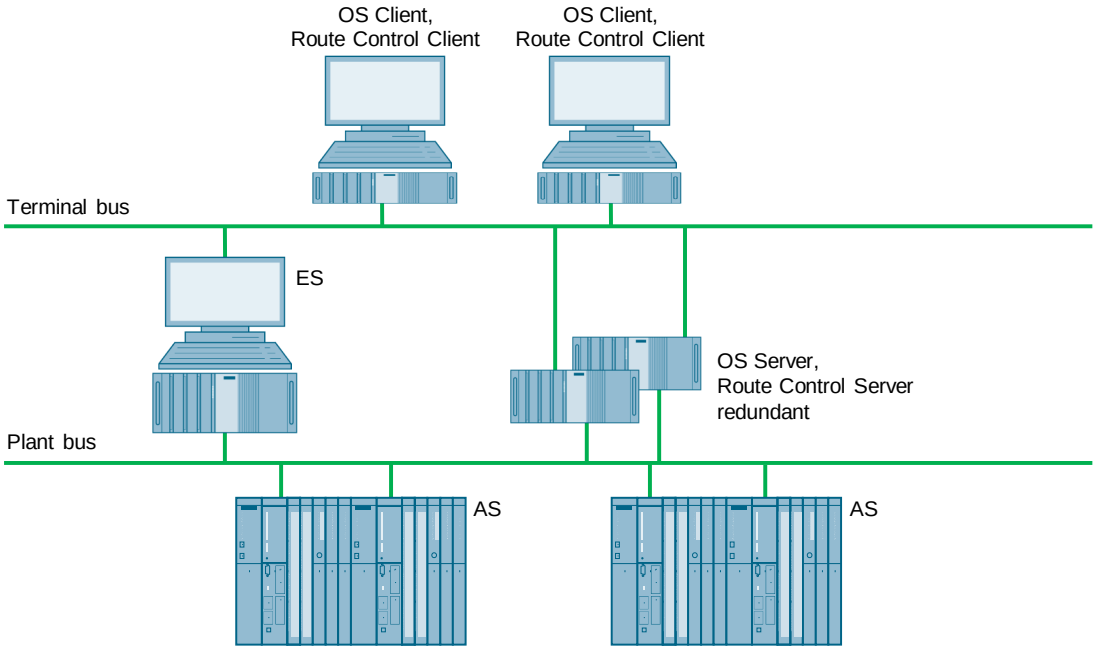
1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) At least one SIMATIC Route Control Routes license (for sets of 10/50) is required per project. The number of routes can be increased at a later stage with cumulative SIMATIC Route Control Routes licenses.

## 9.3 Redundant SIMATIC Route control client/Server architecture

In this configuration, the system has one redundant Route Control server pair and two Route Control clients. The ES is configured on a separate PC. The terminal bus and the plant bus are also set up on a redundant basis.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 7)<br>8)<br>9) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6ES7658-7DX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **OS server, Route Control server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 7)<br>8)<br>9) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 2 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 6) |
| 1 | | 6XV1870-3RH60 | SIMATIC NET INDUSTRIAL ETHERNET TP XP CORD RJ45/RJ45, 6M | |
| 2 | | 6ES7658-7FX28-0YB0 | SOFTWARE SIMATIC ROUTE CONTROL SERVER V8.2 | |
| 1 | | 6ES7658-7FF00-0XB0 | SOFTWARE SIMATIC ROUTE CONTROL (10 ROUTES) | 5) |
| **OS client, Route Control client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 7)<br>8)<br>9) |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| 2 | | 6ES7658-7EX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL CENTER V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CN33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Needed if a redundant system bus is chosen.

2) The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is chosen.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) At least one SIMATIC Route Control Routes license (for sets of 10/50) is required per project. The number of routes can be increased at a later stage with cumulative SIMATIC Route Control Routes licenses.

6) Additional network cards are required for redundancy switching.

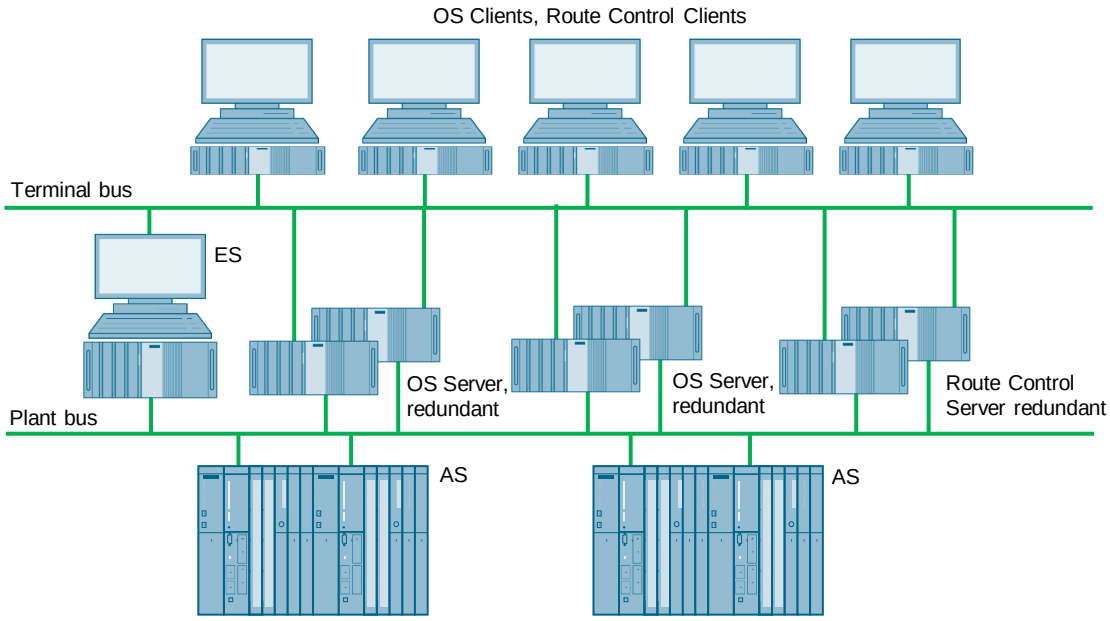
7) The onboard interfaces can be used.

8) Single license for one installation.

9) Necessary if a redundant terminal bus is selected.

## 9.4 SIMATIC Route Control multi-server

In this configuration, the system has one redundant Route Control server pair and five Route Control clients. The ES is configured on a separate PC.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF21-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16 GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6ES7658-7DX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 4 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 4 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 2 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2)<br>6) |
| **Route Control server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 2 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 5) |
| 1 | | 6XV1870-3RH60 | SIMATIC NET INDUSTRIAL ETHERNET TP XP CORD RJ45/RJ45, 6M | |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 2 | | 6ES7658-7FX28-0YB0 | SOFTWARE SIMATIC ROUTE CONTROL SERVER V8.2 | |
| 1 | | 6ES7658-7FF00-0XB0 | SOFTWARE SIMATIC ROUTE CONTROL (10 ROUTES) | 4) |
| **OS client, Route Control client** | | | | |
| 5 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 5 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 5 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| 5 | | 6ES7658-7EX28-0YB5 | SOFTWARE SIMATIC ROUTE CONTROL CENTER V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CQ33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 2k+ PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 3) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Required for a redundant automation system.

2) The number of POs can be increased later by means of extra volume licenses.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

4) At least one SIMATIC Route Control Routes license (for sets of 10/50) is required per project. The number of routes can be increased at a later stage with cumulative SIMATIC Route Control Routes licenses.

5) Additional network cards are required for redundancy switching.

6) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

# 10 SIMATIC Route Control and SIMATIC BATCH

For BATCH applications that need transparent material transportation between sub-systems, SIMATIC PCS 7 supports the integration of SIMATIC BATCH and SIMATIC Route Control into a single system. The ISA-88-based recipe management and batch processing software SIMATIC BATCH integrates seamlessly with Route Control and allows material transport to be controlled via the recipe functions in the control recipe. Both SIMATIC BATCH and Route Control can be used for systems that range from starter size up to distributed client/server architectures.

Using SIMATIC BATCH and SIMATIC Route Control in a single system, it is possible to implement the following configurations:

**Starter system**

The smallest system is the single-user station architecture in which all functions, engineering, operation, batch control and path control are installed on a single PC. Batch functions and operations as well as material transport are performed in the automation system.



**Client/server**

Mid-sized systems that support multiple users and do not need redundancy are implemented as client/server systems. SIMATIC BATCH and SIMATIC Route Control use the OS architecture by utilizing the BATCH and Route Control server/client applications on the corresponding OS PCs.

**Redundant client/server**

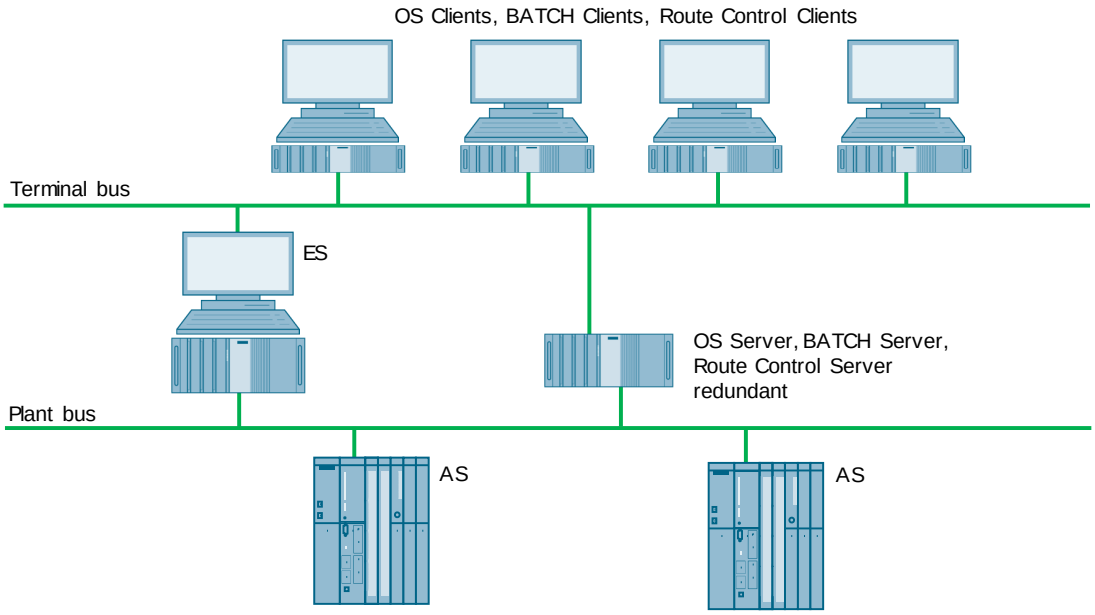
When redundancy is required and the number of servers must be kept as small as possible, SIMATIC BATCH and SIMATIC Route Control can be used on the basis of redundant OS servers (a combination of three redundant functions on two servers).

**Redundant client/multi-server**

When it comes to large, high-performance applications, the SIMATIC PCS 7 client/server architecture allows the distribution of applications over multiple PCs. In this case, the BATCH server, the Route Control server, and the OS server run on two or three independent PCs. Each of them can be configured redundantly, which achieves very high availability. The OS client client PCs can run the BATCH and Route Control client applications and access both the OS server and the BATCH and Route Control server. If necessary, the OS client, the Route Control client, and the BATCH client application can run on separate PCs too.

### Example of a configuration

The illustration below shows a sample configuration with three OS Clients/Route Control Clients/BATCH Clients. The OS Server, Route Control Server, and the BATCH Server are configured on one PC.



# 11 Archiving

**SIMATIC PCS 7 archiving**

Archiving of data for analysis purposes in OS clients where the system collects large amounts of data over long periods is supported by the Process Historian. The Process Historian collects the archive data from the OS servers. This data can be visualized on OS clients or single stations either directly or with the support of the Information Server. For long-term archiving, archive data from the Process Historian can be stored on external media (such as backup drives) and retrieved for further analysis.

**Client/server system**

The Process Historian always runs on a separate PC. The basic hardware for the Process Historian is the SIMATIC PCS 7 Industrial Workstation of the type IPC847D, server version, with an additional hard disk for the operating system and SIMATIC PCS 7 software. A RAID 1 hard drive configuration can be used for the database.

**Note** The use of a Fujitsu Primergy server is recommended for larger quantity structures (more than 3 OS servers in the maximum archive configuration); see under Premium Server in the ST PCS 7 AO catalog, Add-ons for SIMATIC PCS 7.

All of the OS clients can retrieve data from the Process Historian; i.e., there is no difference between accessing the data of the OS server and accessing the data of the Process Historian.

**Redundant OS Server, single Process Historian**

If redundant operation and monitoring are required and a high availability of archive data is not mandatory, a single Process Historian can be connected to a redundant OS server pair.

**Redundant Process Historian**

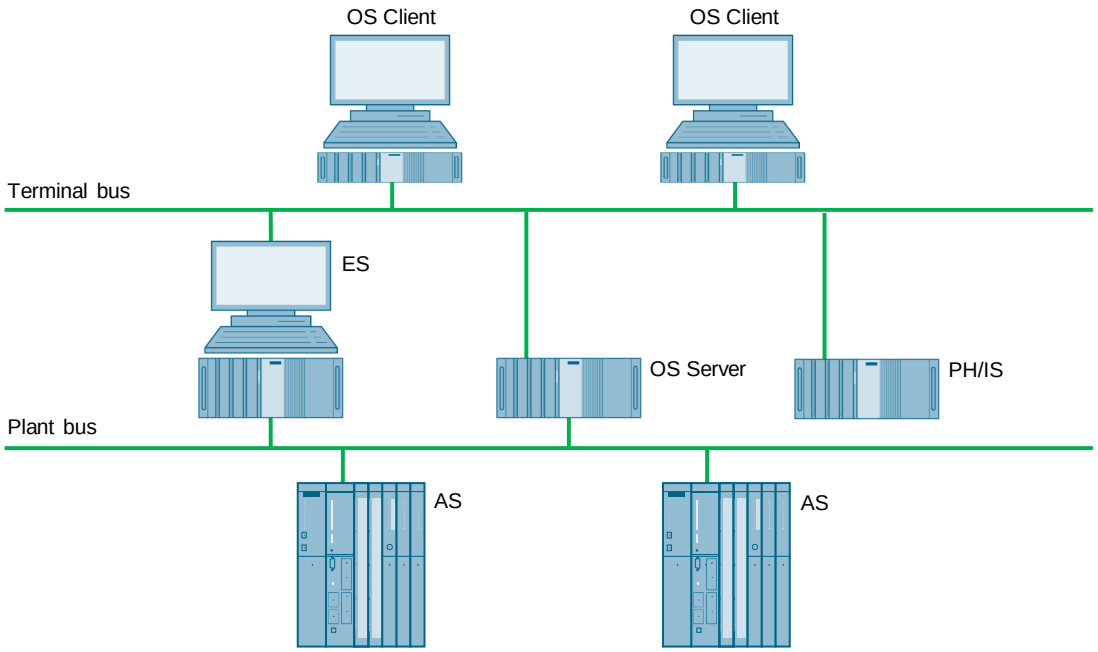
If high availability of archive data is needed, as from SIMATIC PCS 7 V8.0 SP1, SIMATIC PCS 7 offers the option of a redundant Process Historian.

**Information Server**

The Information Server is the reporting system of the Process Historian. Based on the Microsoft Reporting Services, it offers web-based thin-client access to the historical data. Add-ins for Microsoft Word and Excel provide additional access to the database of the Process Historian. The Information Server can be installed and operated on the Process Historian hardware or on separate hardware. When the Process Historian is configured redundantly, the separation of the Information Server is mandatory. Any OS client version of the SIMATIC PCS 7 Industrial Workstation is suitable for the separate Information Server.

## 11.1 OS Client/OS Server

In this configuration, the system has one OS server and two OS clients.
The ES and the Process Historian are each configured on a separate PC.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) 3) |
| **Process Historian/Information Server** | | | | |
| 1 | | 6ES7660-6HN38-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, XEON E3, OS SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING) + 240GB SSD SATA, 32GB DDR3, PCS 7 V8.2, WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-7AX28-2YB0 | SOFTWARE SIMATIC PCS 7 PROCESS HISTORIAN UND INFORMATION SERVER BASIC PACKAGE V8.2 | |
| | 1 | 6ES7652-7YA00-2YB0 | SOFTWARE SIMATIC PCS 7 INFORMATION SERVER CLIENT ACCESS (1 CLIENT) | 4) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

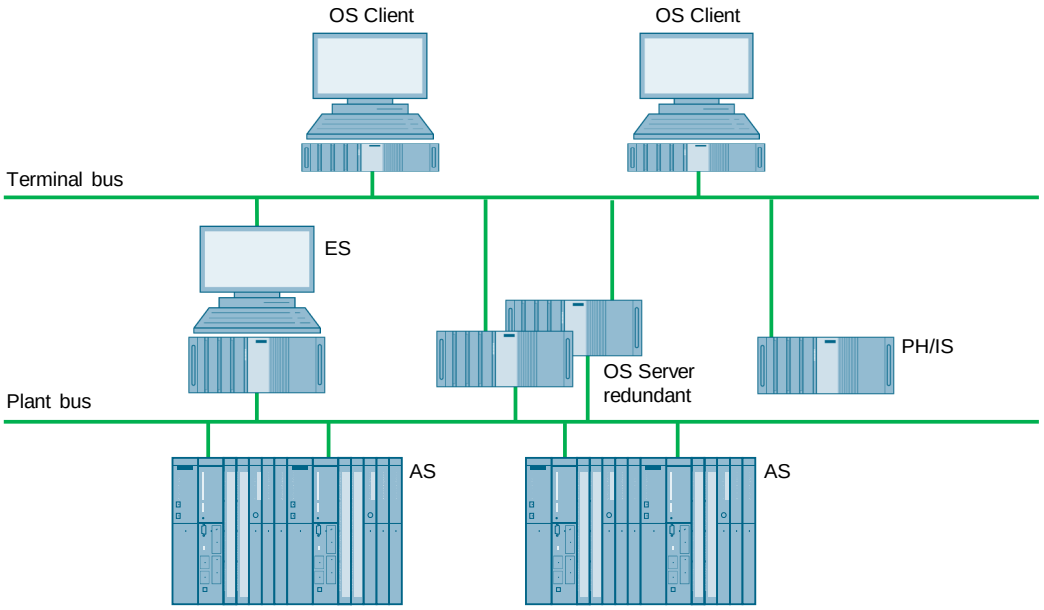
2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The tag inventory can be expanded to up to 120,000 archive tags using cumulative
SIMATIC PCS 7 OS/PH Archive volume licenses.

4) The number of clients can be expanded with cumulative Information Server Client Access licenses.

## 11.2 Redundant OS server pair and single Process Historian

In this configuration, the system has one redundant OS server pair and two OS clients. The ES and the Process Historian are each configured on a separate PC. The terminal bus and the plant bus are also set up on a redundant basis.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering system** | | | | |
| 1 | | 6ES7660-6DF21-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16 GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8)<br>9)<br>10) |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) 9) 10) |
| **Process Historian/Information Server** | | | | |
| 1 | | 6ES7660-6HN38-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, XEON E3, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING) + 240GB SSD SATA, 32GB DDR3, PCS 7 V8.2, WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) 9) 10) |
| 1 | | 6ES7652-7BX28-2YB0 | SOFTWARE SIMATIC PCS 7 PROCESS HISTORIAN AND INFORMATION SERVER BASIC PACKAGE V8.2 | 5) |
| | 1 | 6ES7652-7YA00-2YB0 | SOFTWARE SIMATIC PCS 7 INFORMATION SERVER CLIENT ACCESS 1 CLIENT | 7) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) 9) 10) |
| 2 | | 6ES7648-0CB00-0YA0 | SIMATIC PC KEYBOARD GERMAN / INTERNATIONAL USB INTERFACE | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CN33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Needed if a redundant system bus is chosen.

2) The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is chosen.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) The tag inventory can be expanded to up to 120,000 archive tags using cumulative SIMATIC PCS 7 OS/PH Archive volume licenses.

6) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

7) The number of clients can be expanded with cumulative Information Server Client Access licenses.

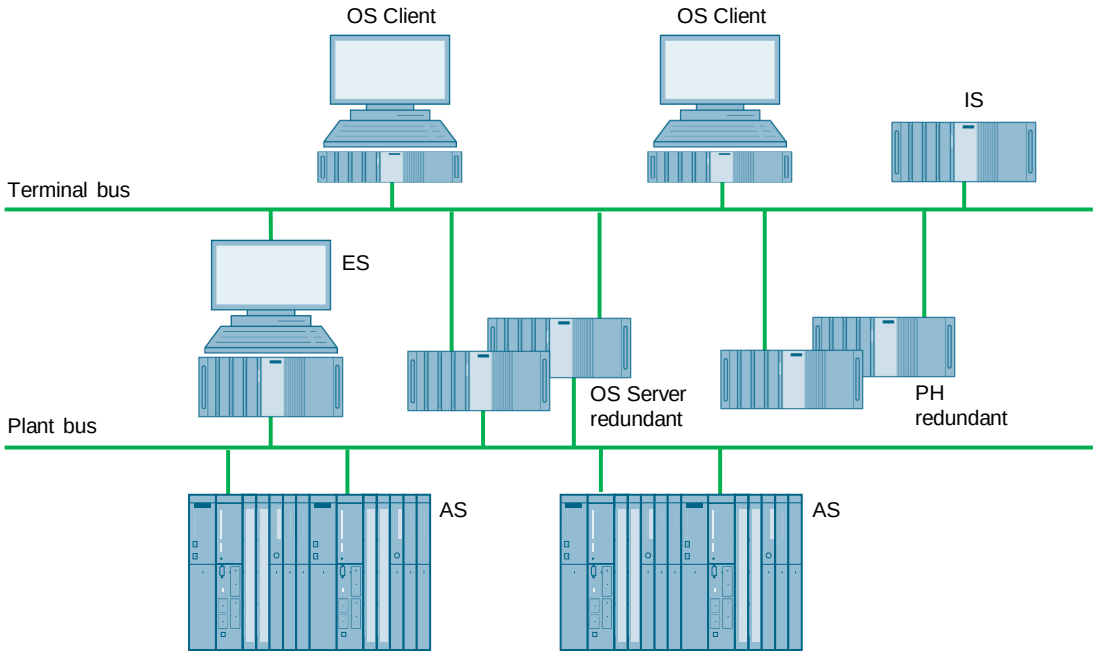
8) The onboard interfaces can be used.

9) Single license for one installation.

10) Necessary if a redundant terminal bus is selected.

## 11.3 Redundant OS server pair and redundant Process Historian

In this configuration, the system has one redundant OS server pair and two OS clients. The ES and the Process Historian are each configured on a separate PC, with the Process Historian being configured on a redundant basis. The terminal bus and the plant bus are also set up on a redundant basis.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 9) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 9) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| **Process Historian** | | | | |
| 2 | | 6ES7660-6HN38-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, XEON E3, OS-SERVER, RAID1 (2 x 1 TB HDD SATA, DATA MIRRORING) + 240GB SSD SATA, 32GB DDR3, PCS 7 V8.2, WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-7CX28-2YB0 | SOFTWARE SIMATIC PCS 7 PROCESS HISTORIAN SERVER REDUNDANCY V8.2 | 5) |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 9) |
| 2 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 8) |
| 1 | | 6XV1870-3RH60 | SIMATIC NET INDUSTRIAL ETHERNET TP XP CORD RJ45/RJ45, 6M | 6) |
| **Information Server** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 9) |
| 1 | | 6ES7652-7EX28-2YB0 | SOFTWARE SIMATIC PCS 7 INFORMATION SERVER BASIC PACKAGE V8.2 | 7) |
| 1 | | 6ES7652-7YA00-2YB0 | SOFTWARE SIMATIC PCS 7 INFORMATION SERVER CLIENT ACCESS 1 CLIENT | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 9) |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7656-6CN33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |



**Note**

1) Needed if a redundant system bus is chosen.

2) The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is chosen.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) The tag inventory can be expanded to up to 120,000 archive tags using cumulative SIMATIC PCS 7 OS/PH Archive volume licenses.

6) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

7) The number of clients can be expanded with cumulative Information Server Client Access licenses.

8) The second network card is used for redundancy switching.

9) The onboard interfaces can be used.
Single License for one installation.
Necessary if a redundant terminal bus is selected.

# 12 SIMATIC PDM

### SIMATIC PDM

The SIMATIC Process Device Manager (PDM) enables easy configuration of HART, FOUNDATION Fieldbus H1, PROFIBUS PA and PROFIBUS DP devices that are based on open EDDL (Electronic Device Description Language) technology.

SIMATIC PDM is a universal tool for parameter assignment, diagnostics, commissioning, servicing and maintenance of field devices. In addition, Asset Management accesses the PDM diagnostic data from field devices.

PDM is fully integrated in the SIMATIC PCS 7 Engineering System.

SIMATIC PDM V9.0 supports communication with devices on PROFINET, PROFIBUS DP, PROFIBUS PA, FOUNDATION Fieldbus H1 and HART (ET200M, ET200SP, or ET200iSP modules, modem, RS 232). SIMATIC PDM can be used in stand-alone operation as well as integrated in STEP 7 / PCS 7.

**Note** In the Delivery Release information, you will find a list of devices supported by a PDM version and profiles.



### Stand-alone

PDM can also be used for stand-alone operation. The stand-alone version is installed on a standard PC and connected to the PROFIBUS DP fieldbus or the PROFINET fieldbus. This configuration allows you to carry out parameter assignment and maintenance tasks for HART, PROFIBUS PA, PROFIBUS DP and PROFINET. PROFIBUS DP/PA devices can be accessed from the LifeList. Connected HART devices can also be accessed from a HART modem (point-to-point).

### SIMATIC PDM with SIMATIC Field PG on the plant bus

In a PCS 7 system, maintenance, servicing and parameter transfer on field devices can be done using a service field PG with SIMATIC PDM. Its robust design is particularly suitable for rugged day-to-day industrial use.

### Starter System

It already makes economic sense to use the fully integrated version of SIMATIC PDM for a system that has as few as 100 inputs and outputs. Engineering and maintenance functions are accessible through the connections to HART, FOUNDATION Fieldbus, PROFIBUS PA, PROFIBUS DP and PROFINET devices that can be connected to a SIMATIC PCS 7 BOX RTX ES/OS system.

**Single-user system (single station)**

When using a single-user system, PDM connects to field devices via the Ethernet system bus and the routing functionality of the automation system.

**Client/server system**

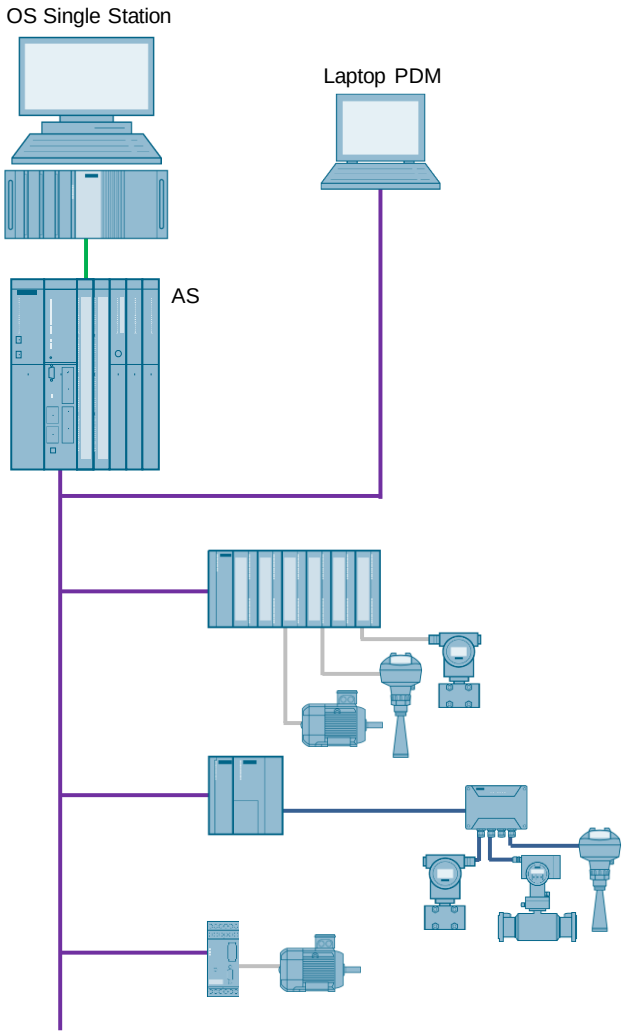
PDM is installed in the Engineering System of medium to large system configurations, with or without a redundant server, and connected to field devices over the Ethernet system bus and the routing functionality of the automation system.

**Non-SIMATIC S7 master**

Non-PCS 7 PROFIBUS DP masters can use the Ethernet to PROFIBUS DP (IE/PB Link) interfaces, which allow a seamless connection to lower-level field devices. By integrating PDM into STEP 7, more field devices can be managed comprehensively and their data can be archived and versioned just like in SIMATIC PCS 7.

## 12.1 SIMATIC PDM stand-alone

In this configuration, the system has one laptop and SIMATIC PDM in stand-alone operation. The connection to the field devices is made by means of PROFIBUS DP.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Laptop PDM** | | | | |
| 1 | | 6GK1571-0BA00-0AA0 | SIMATIC S7, PC ADAPTER USB NETWORK CARD | 1) |
| | 1 | 6GK1561-2AA00 | CP5612 COMMUNICATION PROCESSOR PCI CARD (32 BIT / 64 BIT) | 1) |
| 1 | | 6ES7658-3AB58-0YA5 | SOFTWARE SIMATIC PDM BASIC V9.0 (4 TAGs) | 2) |

**Note**

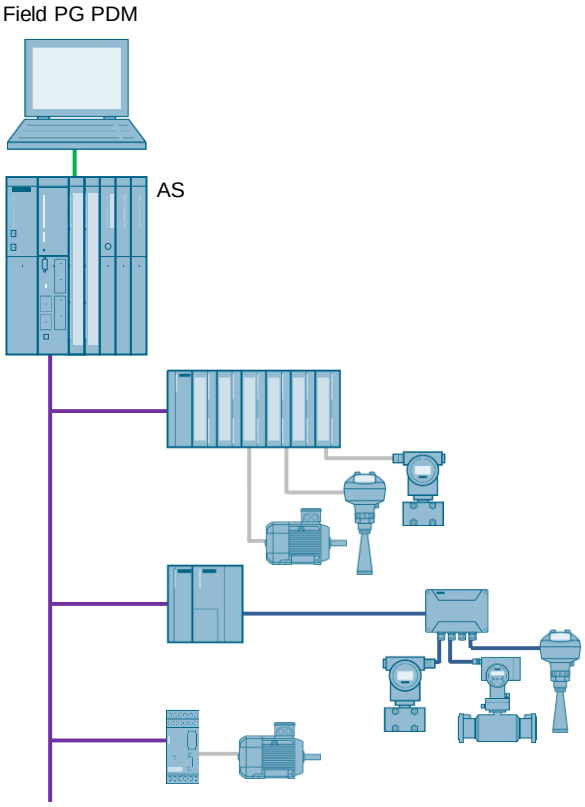
The SIMATIC PCS 7 single-user system is not listed.

1) USB network card for laptop use. Use CP5612 (or other approved network cards) for desktop PC systems.

2) The number of TAGs can be increased by means of cumulative TAG licenses.

## 12.2 SIMATIC PDM with SIMATIC Field PG on the system bus

In this configuration, the system has one Field PG and SIMATIC PDM in stand-alone operation. The connection to the field devices is made by means of the system bus.






**Parts list**

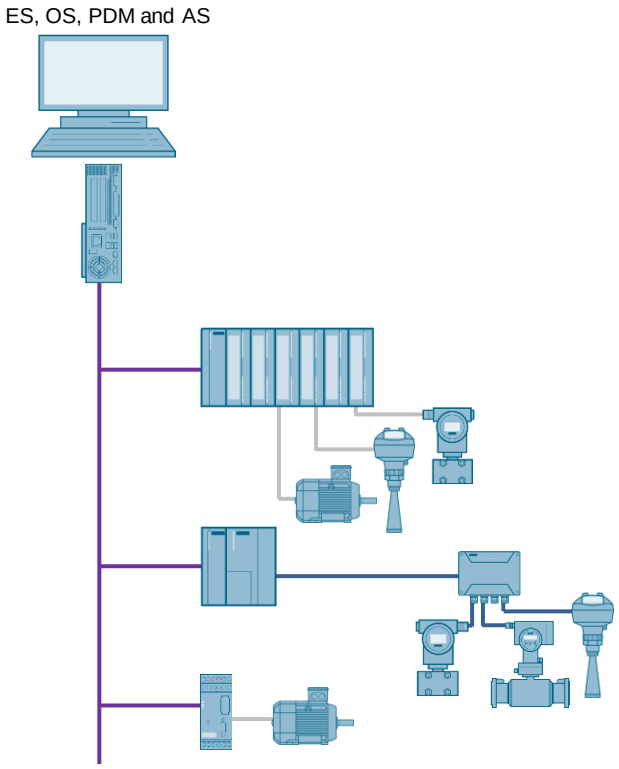
| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Laptop PDM** | | | | |
| 1 | | 6ES7658-3JD58-0YA5 | SOFTWARE SIMATIC PDM SERVICE V9.0 (100 TAGs) | 1) |
| 1 | | 6ES7658-3CX58-2YB5 | SOFTWARE SIMATIC PDM ROUTING V9.0 | |

**Note**

1) The number of TAGs can be increased by means of cumulative TAG licenses.

## 12.3 SIMATIC PDM and PCS 7 Starter System

In this configuration, the system has one SIMATIC PCS 7 BOX RTX with integrated ES, AS, OS, and PDM. The connection to the field devices is made by means of PROFIBUS DP.



**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, PDM, Operator Station, and Automation System** | | | | |
| 1 | | 6ES7650-4BB00-2LA0 | PCS 7 V8.2 BOX RTX ES/OS SYSTEM (WINAC RTX 2010);WINDOWS 7 ULTIMATE 32BIT; PCS 7 V8.2 PREINSTALLED | 1) 3) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| 1 | | 6ES7658-3LD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAGS) | 2) |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 3) 2) |
| | | 24 V DC power supply | Buffered power supply | Section 18.4 |

**Note**

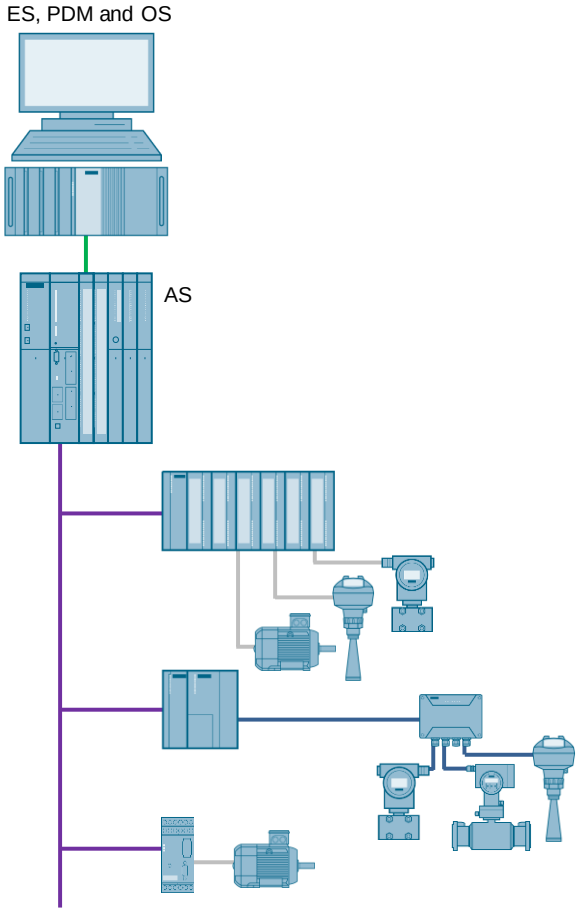
1) Please use the PCS 7 BOX configurator, as the PCS 7 BOX is available in different versions, e.g. 24V DC or 110/230V AC.

2) The number of TAGs can be increased by means of cumulative TAG licenses.

3) Optional for FOUNDATION Fieldbus communication.

## 12.4 SIMATIC PDM and PCS 7 single-user system

This configuration is a system in which the ES, OS, and PDM are used on one PC as a single-user system. The connection to the field devices is made by means of the system bus.



**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, PDM, and Operator Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| 1 | | 6ES7658-3LD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAGS) | 3) |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0. | 4) |
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 2) 5) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

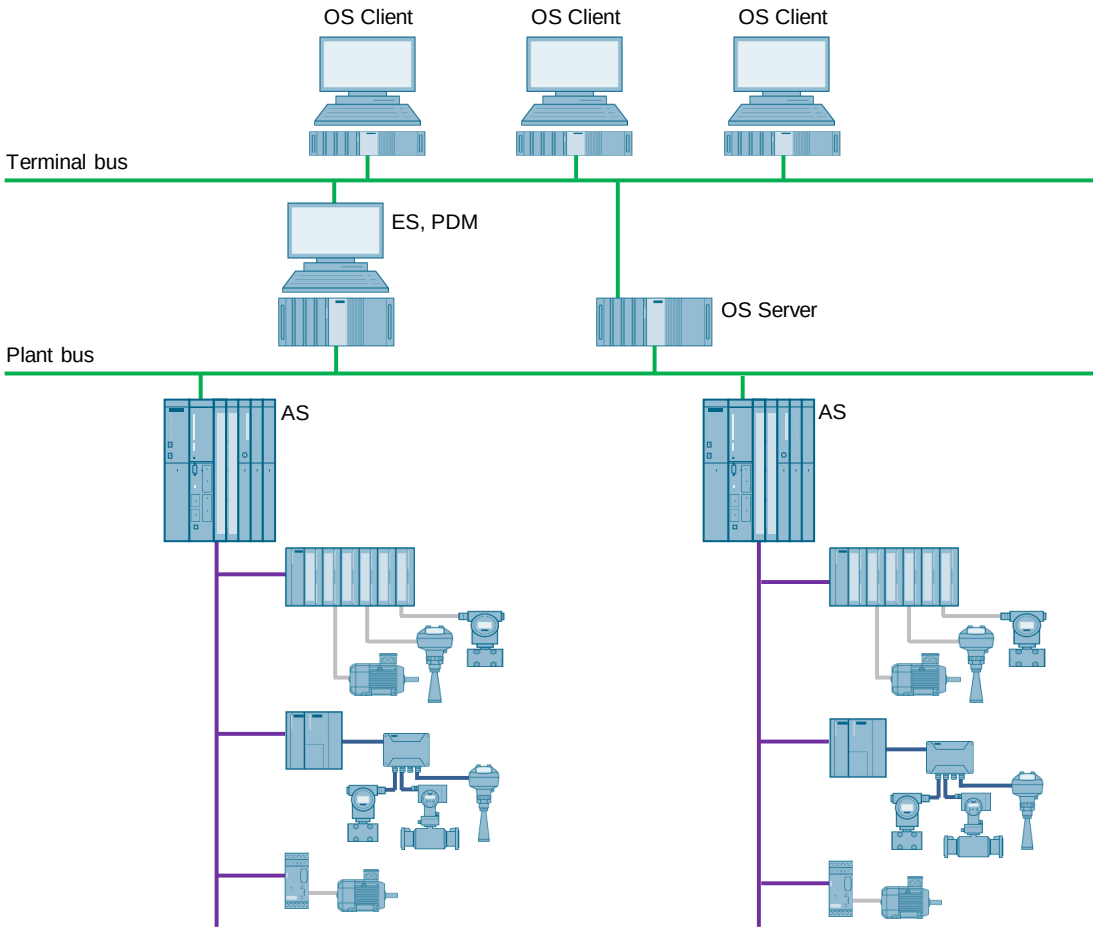
3) The number of TAGs can be increased by means of cumulative TAG licenses.

4) Optional for FOUNDATION Fieldbus communication

5) The following applies to each Standard CPU/CPU PN: If you use the PROFIBUS DP interface of the CPU for data record routing, you must configure this CPU in the HW config with firmware V5.1 or higher. If this is not the case, it needs a CP443-5 Ext PROFIBUS communications module to use PDM data record routing.

## 12.5 SIMATIC PDM and PCS 7 OS Client/OS Server system

In this configuration, the system has one OS server and three OS clients. The ES and the SIMATIC PDM are configured on a separate PC.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| 1 | | 6ES7658-3LD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAGS) | 3) |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 4) |
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SOFTWARE SERVER V8.2 (PO 100) | 1) |
| **OS client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) 5) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

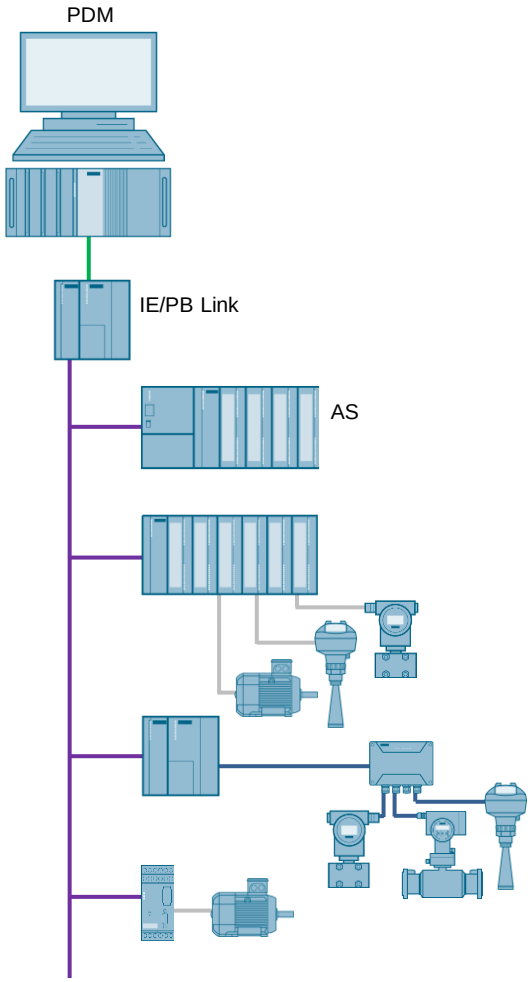
3) The number of TAGs can be increased by means of cumulative TAG licenses.

4) Optional for FOUNDATION Fieldbus communication

5) The following applies to each Standard CPU/CPU PN: If you use the PROFIBUS DP interface of the CPU for data record routing, you must configure this CPU in the HW config with firmware V5.1 or higher. If this is not the case, it needs a CP443-5 Ext PROFIBUS communications module to use PDM data record routing.

## 12.6 SIMATIC PDM and non-SIMATIC S7 master

In this configuration, the system has SIMATIC PDM on a non-SIMATIC S7 master. The connection to the field devices is made by means of the system bus.



**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **PDM** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7810-4CC10-0YA5 | SOFTWARE SIMATIC S7 STEP7 V5.5 SP4 | |
| | 1 | 6ES7658-3KD58-0YA5 | SOFTWARE SIMATIC PDM S7 V9.0 (100 TAGS) | 2) |
| **Plant bus** | | | | |
| 1 | | 6GK1411-5AB00 | IE/PB-Link PN IO NETWORK TRANSITION BETWEEN IND. ETHERNET AND PROFIBUS | 1) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The IE/PB module needs a 24VDC power supply.

2) The number of TAGs can be increased by means of cumulative TAG licenses.

# 13 SIMATIC Management Console

The SIMATIC Management Console (referred to in the rest of this document as the Management Console) is SIMATIC PCS 7 product family software. The Management Console provides functions for acquiring inventory data and software administration of a PCS 7 system. Software administration using a central Management Console is more efficient than with a local PCS 7 installation.

## 13.1 Basic functions of the Management Console

The functions below are available without configuring the Management Console:

- Displaying the computers of a network
  In a PCS 7 system, the Management Console can make a connection to the computers on which the SIMATIC Management Agent service is installed.
- Assigning computers to the Management Console
- Determining groups that contain computers that have to be managed
- Displaying and exporting messages
- Displaying and exporting the event log

## 13.2 Functions of the Management Console

Using the Management Console, the following functions are available:

- Functions for software administration
- Functions for determining inventory data

### 13.2.1 Functions for software administration

The Management Console offers the following functions for central administration of software on assigned computers:

- On the Management Console, it is possible to determine the SIMATIC software that is installed on a computer.
- To install SIMATIC software packages, the Management Console accesses the functions of the respective product setup routine. The following installation variants are possible:
  - Installing new software packages
  - Updating software packages
- Using the Management Console, you can specify common installation steps for a group of computers.

**Note** In this connection, consider the article entitled "Which products can you install using the SIMATIC Management Console?"

### 13.2.2 Functions for determining inventory data

The Management Console provides functions for determining the inventory data of the objects in a PCS 7 system.

**Objects**

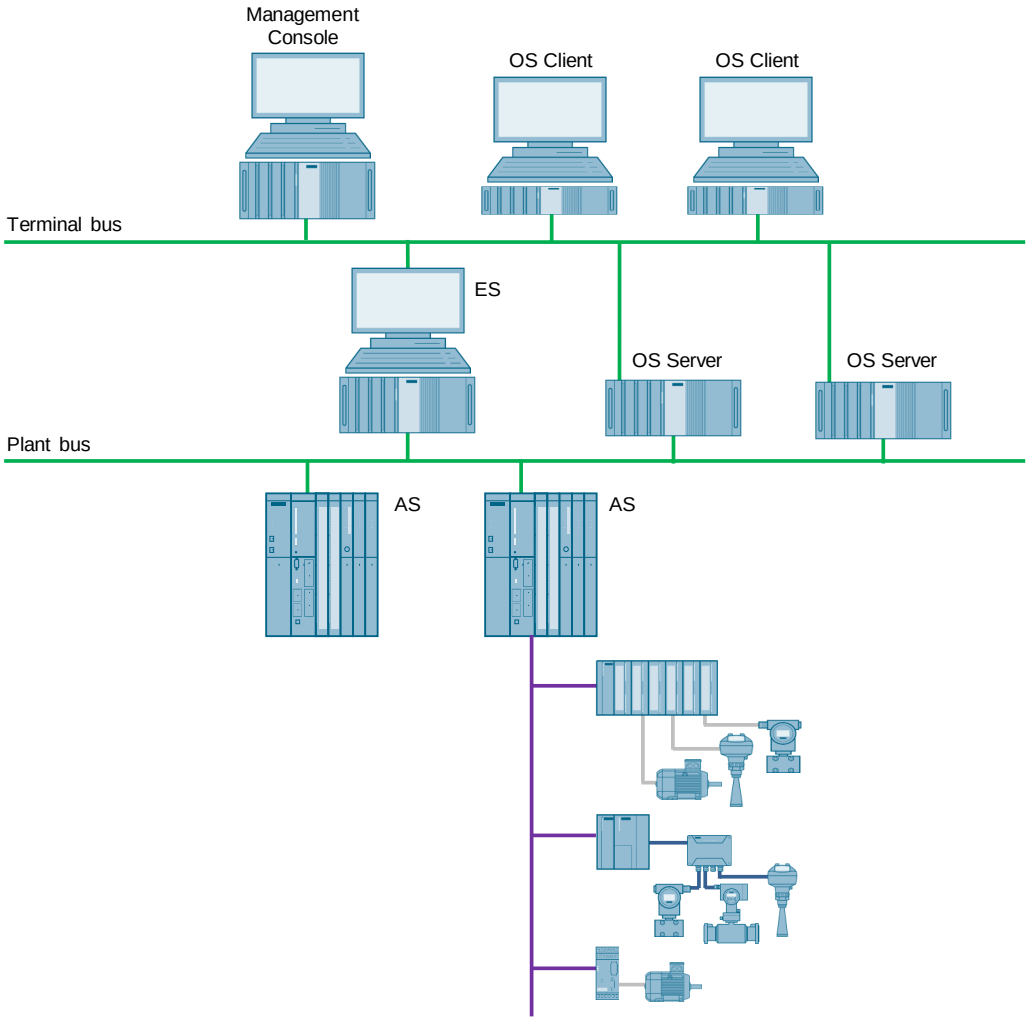
The source of the inventory data can be objects of the plant (online data) or objects in project data (offline data). It is possible to determine inventory data for the following objects of the PCS 7 system:

- Computers
- Network components (Ethernet switches)
- Automation systems
- Remote I/Os (including the I/O assemblies)
- Field devices

### Inventory data

Inventory data can include the following information:

- Plant designation (depending on the designation system e.g. AKZ/TAG)
- Geographical position (depending on the designation system e.g. OKZ)
- Description (user-defined)
- Message (user-defined)
- Device type
- Serial number
- Order number (e.g. Siemens MLFB)
- Hardware version
- Firmware version
- Installed SIMATIC software
- License information (license keys with SIMATIC software)



**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, Operator Station, and Automation System** | | | | |
| | 1 | | EXISTING ENGINEERING STATION | 1) |
| | 1 | | SEPARATE WIN SERVER 2012 R2 COMPUTER | 1) |
| 1 | | 6ES7658-5BX28-2YB5 | SOFTWARE MANAGEMENT CONSOLE V8.2 | |

**Note**

1) Only ever install one Management Console on one network. Using several Management Consoles can result in inconsistencies.
If possible, install the Management Console on a computer that is not needed for operator control and monitoring.
The Management Console must **not** be installed on one of the following computers:

- A computer with server functions (e.g. a server or single-user system for OS, BATCH, Route Control, or a Domain Controller)
- A computer for acquiring archive data (e.g. Process Historian)

# 14 SIMATIC PCS 7 Asset Management

The functionality of SIMATIC PCS 7 asset management provides you with comprehensive diagnostic and maintenance information, at any time, is fully integrated in the Operator System and contains complete system information on one Maintenance Station.

The diagnostics screens that are structured according to the process cell hierarchy with the operating states of the SIMATIC PCS 7 components can be displayed on the SIMATIC PCS 7 Maintenance Station and also on the OS clients. More detailed diagnostic information that has also been determined by SIMATIC PDM is displayed in the faceplates of these stations. However, enhanced online diagnostics functions in conjunction with HW Config can only be launched from the SIMATIC PCS 7 Maintenance Station.

**Starter system**

The SIMATIC PCS 7 BOX RTX system supports the full asset management functionality of the integrated automation system, the PC station and all connected field devices.

**Single-user station**

The ES, OS and asset management functions are connected to the single-user station via the Ethernet system bus. Asset Management provides diagnostic and maintenance data of the automation system, the PC station, the active networking components and all of the connected field devices.

**Client/server (redundant)**

In a client/server architecture, the asset management system is modeled on the distributed client/server structure in SIMATIC PCS 7. The asset management system uses standard condition codes and messages from the PCS 7 OS. The maintenance server is based on an OS server. It can be implemented as a combined OS/MS server (i.e. on an existing OS server) or as a separate MS server.

The OS clients that are logged on to the MS server can access maintenance images in PCS 7 just like standard process images. These maintenance images include additional information for detailed diagnostics and troubleshooting of intelligent field devices.

**Note** There is exactly one MS server for each project.

## 14.1 Asset Management Starter System

This configuration is a SIMATIC PCS 7 BOX RTX system with ES, OS, AS, and Maintenance Station.


**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, Operator Station, and Automation System** | | | | |
| 1 | | 6ES7650-4BB00-2LA0 | PCS 7 V8.2 BOX RTX ES/OS SYSTEM (WINAC RTX 2010);WINDOWS 7 ULTIMATE 32BIT; PCS 7 V8.2 PREINSTALLED | 1) 5) |
| 1 | | 6ES7658-7GB28-0YB0 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | 2) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-3LD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAGS) | 3) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 Maintenance Station Engineering V8.2 | |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 4) |
| | | 24 V DC power supply | Buffered power supply | Section 18.4 |

**Note**

PDM is not absolutely necessary for Asset Management; but rather, it is an optional expansion.

PDM is necessary when operating intelligent field devices or when using the AssetMon module (for the integration of non-intelligent devices in Asset Management).

**Note**

1) Please use the PCS 7 BOX configurator, as the PCS 7 BOX is available in different versions, e.g. 24V DC or 110/230V AC.

2) The number of Asset TAGs can be increased by means of cumulative Asset TAG licenses.

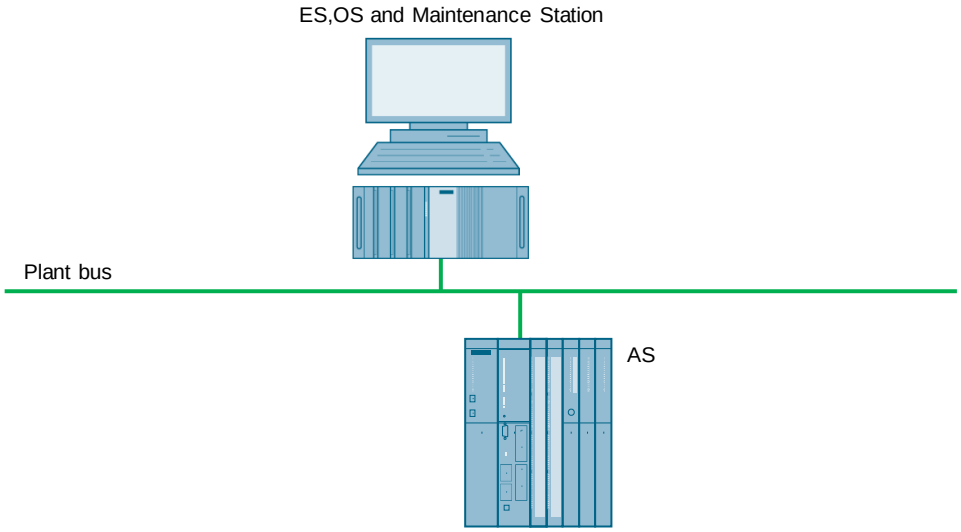
3) The number of TAGs can be increased by means of cumulative TAG licenses.

4) Optional for FOUNDATION Fieldbus communication.

5) Necessary if a redundant terminal bus is selected.

## 14.2 Asset Management single-user system

This configuration is a system in which the ES, OS, and Maintenance Station are used on one PC as a single-user system.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, PDM, and Operator Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-3LD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAGS) | 3) |
| 1 | | 6ES7658-7GB28-0YB0 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | 4) |
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 Maintenance Station Engineering V8.2 | |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 5) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of TAGs can be increased by means of cumulative TAG licenses.

4) The number of Asset TAGs can be increased by means of cumulative Asset TAG licenses.

5) Optional for FOUNDATION Fieldbus communication

### Sample calculation with asset management single-user station

The following is a sample calculation with asset management tags, process objects and PDM tags for a given single-user configuration.

The single-user configuration consists of the following:

- an ES/OS/MS single-user station
- 200 PROFIBUS PA sensors and actuators
- 100 HART analog sensors and actuators
- 32 FOUNDATION Fieldbus H1 sensors and actuators
- 8 ET200M IO racks, total of 50 IO modules
- 80 PROFIBUS DP slaves with EDDL configuration
- 25 PROFIBUS DP slaves without EDDL configuration
- 1 AS 410-5H
- 5 PROFIBUS DP and PA networking segments
- 120 process devices with asset monitoring functionality

**The components below are needed for the configuration mentioned above:**



| Element | Counter value | Asset Management tags | Process objects | PDM tags |
|---|---|---|---|---|
| Computer | 1 | 1 | 0 | 0 |
| PROFIBUS PA | 200 | 200 | 0 | 200 |
| HART | 100 | 100 | 0 | 100 |
| FOUNDATION Fieldbus H1 | 32 | 32 | 0 | 32 |
| ET200M IM bus interface | 8 | 8 | 0 | 0 |
| ET200M module | 50 | 0 | 0 | 0 |
| PROFIBUS DP slaves - EDDL | 80 | 80 | 0 | 80 |
| PROFIBUS DP slaves – without EDDL | 25 | 25 | 0 | 0 |
| Automation system | 1 | 1 | 0 | 0 |
| Networks | 7 | 0 | 0 | 0 |
| Process devices | 120 | 120 | 120 | 120 |
| **Totals** | | | | |
| | | 567 | 120 | 532 |

**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station, PDM, and Operator Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| 1 | | 6ES7658-3LD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAGS) | 3) |
| 4 | | 6ES7658-3XC00-2YB5 | SIMATIC PDM 10 TAGs | 3) |
| 4 | | 6ES7658-3XD00-2YB5 | SIMATIC PDM 100 TAGs | 3) |
| 1 | | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 5) |
| 1 | | 6ES7658-7GB28-0YB0 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | 4) |
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 Maintenance Station Engineering V8.2 | |
| 5 | | 6ES7658-7GB00-2YB0 | SIMATIC PCS 7 MAINTENANCE STATION RUNTIME ASSET-TAGS (100 TAGS) | 4) |
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

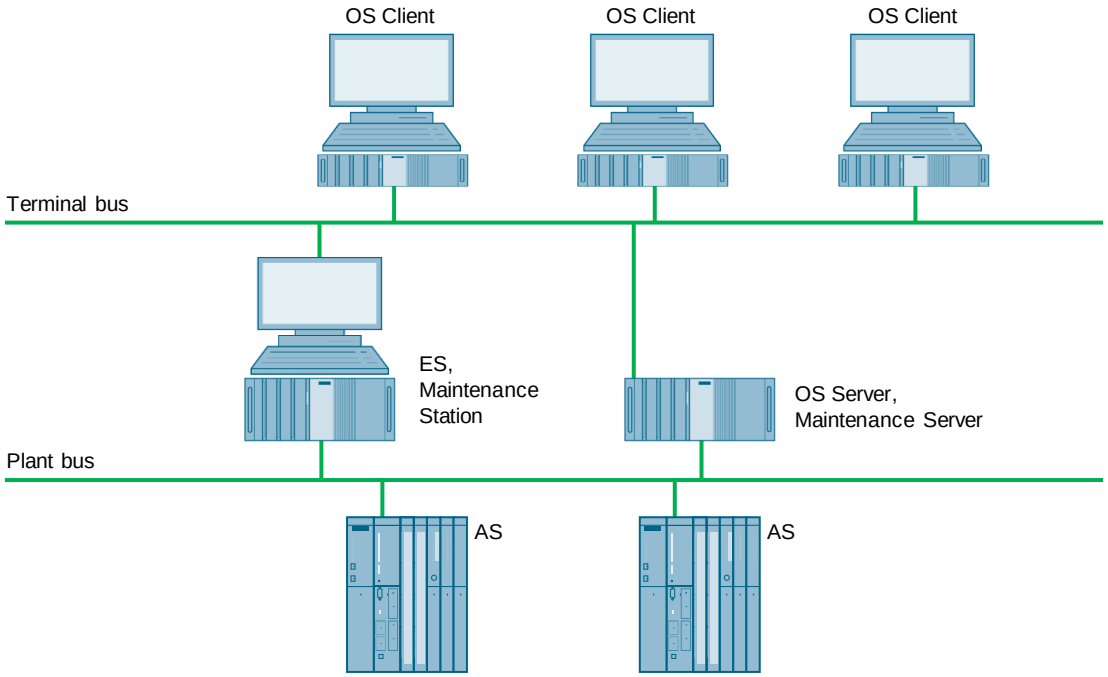
3) The number of TAGs can be increased by means of cumulative TAG licenses in steps of 10/100/1000.

4) The number of Asset TAGs can be increased by means of cumulative Asset TAG licenses.

5) Optional for FOUNDATION Fieldbus communication

## 14.3 OS Client/OSServer Asset Management

In this configuration, the system has one OS server and three OS clients. The ES and the Maintenance Station are configured on a separate PC.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6ES7658-3TD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 server V9.0 (100 TAGs) | 3) |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 5) |
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 Maintenance Station Engineering V8.2 | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| **OS-Server, Maintenance Server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SOFTWARE SERVER V8.2 (PO 100) | 1) |
| 1 | | 6ES7658-7GB28-0YB0 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | 4) |
| **OS client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of TAGs can be increased by means of cumulative TAG licenses.

4) The number of Asset TAGs can be increased by means of cumulative Asset TAG licenses.

5) Optional for FOUNDATION Fieldbus communication

### Sample calculation for the Asset Management client/server

The following is a sample calculation for the number of asset management tags, process objects and PDM tags for a given client/server configuration.

The client/server configuration includes:

- one ES/OS/MS client PC
- one OS server
- three OS clients
- 300 PROFIBUS PA sensors and actuators
- 180 HART analog sensors and actuators
- 80 FOUNDATION Fieldbus H1 sensors and actuators
- 20 ET200M IO racks, total of 135 IO modules
- 160 PROFIBUS DP slaves with EDDL configuration
- 60 PROFIBUS DP slaves without EDDL configuration
- 2 AS 410-5Hs
- 8 PROFIBUS DP and PA networking segments
- 240 process devices with asset monitoring functionality



**The following components are needed for the configuration:**

| Element | Counter value | Asset Management tags | Process objects | PDM tags |
|---|---|---|---|---|
| Computer | 5 | 5 | 0 | 0 |
| PROFIBUS PA | 300 | 300 | 0 | 300 |
| HART | 180 | 180 | 0 | 180 |
| FOUNDATION Fieldbus H1 | 80 | 80 | 0 | 80 |
| ET200M IM bus interface | 20 | 20 | 0 | 0 |
| ET200M module | 135 | 0 | 0 | 0 |
| PROFIBUS DP slaves - EDDL | 160 | 160 | 0 | 160 |
| PROFIBUS DP slaves – without EDDL | 60 | 60 | 0 | 0 |
| Automation system | 2 | 2 | 0 | 0 |
| Networks | 10 | 0 | 0 | 0 |
| Process devices | 240 | 240 | 240 | 240 |
| **Totals** | | | | |
| | | 1047 | 240 | 960 |

### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| 1 | | 6ES7658-3TD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 server V9.0 (100 TAGs) | 3) |
| 8 | | 6ES7658-3XD00-2YB5 | SIMATIC PDM 100 TAGs | 3) |
| 6 | | 6ES7658-3XC00-2YB5 | SIMATIC PDM 10 TAGs | 3) |
| 1 | | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 5) |
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 Maintenance Station Engineering V8.2 | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| **OS-Server, Maintenance Server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER V8.2 (PO 100) | 1) |
| 1 | | 6ES7658-7GX28-0YB5 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | 4) |
| 1 | | 6ES7658-7GC00-2YB0 | SIMATIC PCS 7 MAINTENANCE STATION RUNTIME ASSET-TAGS (1000 TAGS) | 4) |
| **OS client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7654-6CP03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSIONS CARD 1600 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

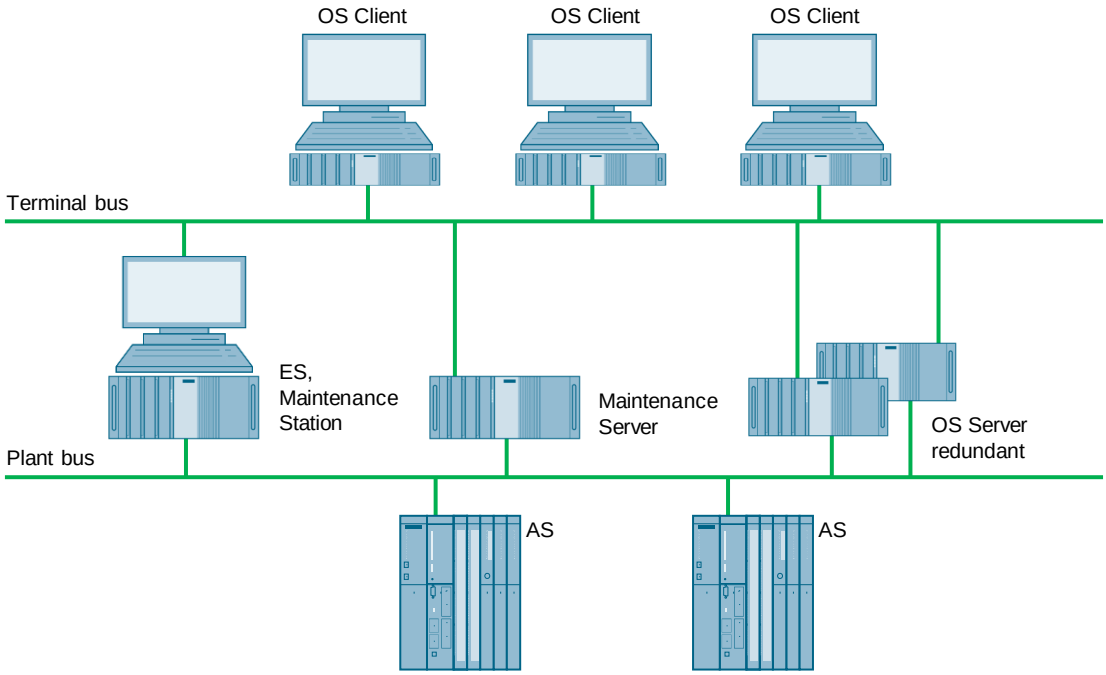
3) The number of TAGs can be increased by means of cumulative TAG licenses in steps of 10/100/1000.

4) The number of Asset TAGs can be increased by means of cumulative Asset TAG licenses.

5) Optional for FOUNDATION Fieldbus communication

## 14.4 Asset Management Client/server with a single maintenance server

In this configuration, the system has one redundant OS server pair and three OS clients. The ES and the Maintenance Station are configured on a separate PC. The Maintenance Server is also configured on a separate PC.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| 1 | | 6ES7658-3TD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAG) | 3) |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 6) |
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 Maintenance Station Engineering V8.2 | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 1)<br>5) |
| **Maintenance server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS-SERVER V8.2 (PO 100) | 1) |
| 1 | | 6ES7658-7GB28-0YB0 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | 4) |
| **OS client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of TAGs can be increased by means of cumulative TAG licenses.

4) Note for asset runtime:

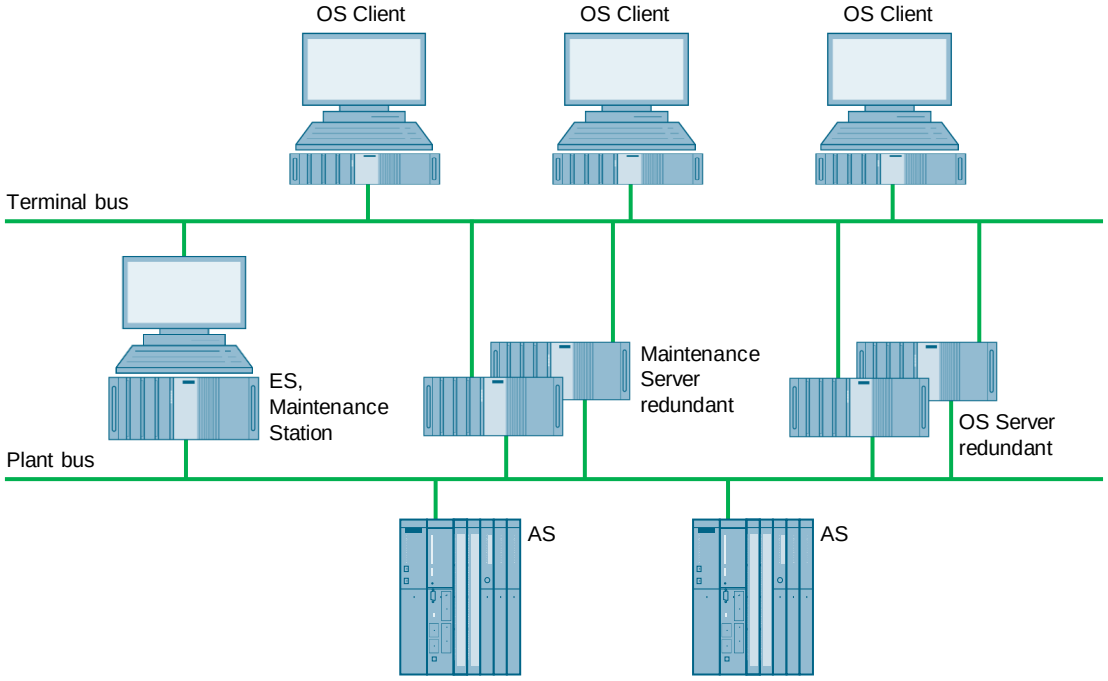
- The number of asset TAGs can be increased by means of cumulative asset TAG licenses. An increase of the asset TAGs requires an increase of AS and OS RT process objects for the maintenance server.

5) The redundant OS server is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can establish an Ethernet connection as an alternative. This requires additional Ethernet network interface cards in the systems.

6) Optional for FOUNDATION Fieldbus communication

## 14.5 Redundant Asset Management for OS Client/OS Server

In this configuration, the system has one redundant OS server pair and three OS clients. The ES and the Maintenance Station are configured on a separate PC. The maintenance server is configured on a redundant basis and as a separate system.






### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6ES7658-3TD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 server V9.0 (100 TAGs) | 3) |
| | 1 | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | 6) |
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 Maintenance Station Engineering V8.2 | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 1) 5) |
| **OS-Server, Maintenance Server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 1) 5) |
| 2 | | 6ES7658-7GB28-0YB0 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | 4) |
| **OS client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

3) The number of TAGs can be increased by means of cumulative TAG licenses.

4) Note for asset runtime:

- The number of Asset TAGs can be increased by means of cumulative Asset TAG licenses
- An increase of the asset TAGs requires an increase of AS and OS RT process objects for the maintenance server.

5) The redundant OS server is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can establish an Ethernet connection as an alternative. This requires additional Ethernet network interface cards in the systems.

### Sample calculation for a redundant Asset Management client/server system

The following is a sample calculation for the number of asset management tags, process objects and PDM tags for a specified redundant client/server configuration.

The redundant client/server configuration includes:

- one ES/OS/MS client PC
- one OS/MS server pair
- one OS server pair
- three OS clients
- 300 PROFIBUS PA sensors and actuators
- 180 HART analog sensors and actuators
- 80 FOUNDATION Fieldbus H1 sensors and actuators
- 20 ET200M IO racks, total of 135 IO modules
- 160 PROFIBUS DP slaves with EDDL configuration
- 60 PROFIBUS DP slaves without EDDL configuration
- 2 AS 410-5Hs
- 8 PROFIBUS DP and PA networking segments
- 240 process devices with asset monitoring functionality



### The following components are needed for the configuration:

| Element | Counter value | Asset Management tags | Process objects | PDM tags |
|---|---|---|---|---|
| Computer | 8 | 8 | 0 | 0 |
| PROFIBUS PA | 300 | 300 | 0 | 300 |
| HART | 180 | 180 | 0 | 180 |
| FOUNDATION Fieldbus H1 | 80 | 80 | 0 | 80 |
| ET200M IM bus interface | 20 | 20 | 0 | 0 |
| ET200M module | 135 | 0 | 0 | 0 |
| PROFIBUS DP slaves - EDDL | 160 | 160 | 0 | 160 |
| PROFIBUS DP slaves – without EDDL | 60 | 60 | 0 | 0 |
| Automation system | 2 | 2 | 0 | 0 |
| Networks | 10 | 0 | 0 | 0 |
| Process devices | 240 | 240 | 240 | 240 |
| **Totals** | | | | |
| | | 1050 | 240 | 960 |

### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| 1 | | 6ES7658-3TD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7 V9.0 (100 TAG) | |
| 8 | | 6ES7658-3XD00-2YB5 | SIMATIC PDM 100 TAGs | |
| 6 | | 6ES7658-3XC00-2YB5 | SIMATIC PDM 10 TAGs | |
| 1 | | 6ES7658-3QX58-2YB5 | SOFTWARE SIMATIC PDM Communication FOUNDATION Fieldbus V9.0 | |
| 1 | | 6ES7658-7GX28-0YB5 | SIMATIC PCS 7 MAINTENANCE STATION ENGINEERING V8.2 | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **OS-Server, Maintenance Server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) |
| 2 | | 6ES7658-7GX28-0YB5 | SOFTWARE SIMATIC PCS 7 Maintenance Station Runtime Basic Package V8.2 (incl. SNMP-OPC server license and 100 Asset TAGs) | |
| 2 | | 6ES7658-7GC00-2YB0 | SIMATIC PCS 7 MAINTENANCE STATION RUNTIME ASSET-TAGS (1000 TAGS) | |
| **OS client** | | | | |
| 3 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 3 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 3 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **Automation system** | | | | |
| 2 | | 6ES7654-6CP03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 1) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

2) The redundant OS server is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can establish an Ethernet connection as an alternative. This requires additional Ethernet network interface cards in the systems.

# 15 Fieldbus

**Individual PROFESSIONAL DP/PROFESSIONAL PA/FOUNDATION Fieldbus/ PROFESSIONAL Fieldbus**

SIMATIC PCS 7 allows the connection of different fieldbus technologies through its flexible architecture and seamless integration. To connect the process devices to the automation system, it is possible to use either PROFINET or the proven PROFIBUS DP.

PROFINET is based on the international standards IEC 61158 and IEC 61784 and combines the advantages of the open network standard Ethernet and the PROFIBUS fieldbus system.

With PROFINET, a large number of participants at the field level can communicate at a speed of up to 100 Mbps. The supported devices include PROFINET Remote IOs as well as PROFIBUS DP compact devices and PROFIBUS PA, via their integrated IE/PB Link PN IO.

**Note** In application example "SIMATIC PCS 7 with PROFINET – typical configurations and engineering", you can find further information about PROFINET integration in PCS 7 with typical PCS 7 architectures and configuration examples.



The PROFIBUS DP is based on robust RS-485 technology and is a versatile, proven fieldbus that supports reliable high-speed data exchange with a large number of slaves. SIMATIC PCS 7 automation systems are equipped with the PROFIBUS DP master functionality and can be extended to several PROFIBUS DP networks.

Repeaters increase expansion of the PROFIBUS network across multiple isolated segments and also the number of possible devices. If diagnostics functions for physical cable diagnostics are desired in addition to the standard repeater functionality, a diagnostics repeater can be used as an alternative. It monitors the copper bus cables in online mode. In the event of a fault, it sends a diagnostic message with detailed information about the type and location of the fault to the PROFIBUS DP master.

Intelligent field devices based on the PROFIBUS PA and FOUNDATION Fieldbus H1 standards can be integrated in SIMATIC PCS 7 by connecting them directly to high-speed PROFIBUS DP via dedicated gateways (e.g. PA Link and FF Link). In addition to data transfer, the PROFIBUS PA and FOUNDATION Fieldbus H1 field devices are fed via the bus.

**Note** In application example"Configuration of FOUNDATION Fieldbus H1 (SS) with SIMATIC PCS 7", you can find further information about PROFINET integration in PCS 7 with typical PCS 7 architectures and configuration examples.

DP/PA coupler, PA Link and FF Link components act as gateways between the high-speed PROFIBUS DP networks and the bus-supplied PA/FF side. This makes it possible to use a larger number of PROFIBUS PA slaves and FF field devices without overloading the existing PROFIBUS DP address space.

Energy limiting components for PROFIBUS DP, PROFIBUS PA and FOUNDATION Fieldbus H1 make it possible to use field devices directly in an environment at risk from explosions.

**Single optical PROFIBUS DP**

To implement greater distances and to achieve ring fault tolerance and electrical isolation, PROFIBUS DP allows the use of fiber-optic network components. The logical bus topology remains a single line whereas the fault-tolerant ring increases availability.

**Highly available optical PROFIBUS DP**

Optical PROFIBUS DP can also be set up as a ring. By combining the redundant PROFIBUS DP and glass fiber network components as a ring, you obtain the highest availability and electrical isolation. The combination of a double fault-tolerant ring allows multiple disruptions to occur without losing the field connection.



**Redundant electrical PROFIBUS DP, PROFIBUS PA and FOUNDATION FIELDBUS H1**

If high availability is required, PROFIBUS DP supports the extension of redundant networks to IO racks as well as DP/PA and FF links. A redundant PROFIBUS DP network consists of two separate electrical cables connected to two independent PROFIBUS masters and multiple redundant DP slaves. The PA Link and FF Link gateways provide the opportunity to build the field device bus PROFIBUS PA or FOUNDATION Fieldbus H1 as a fault-tolerant ring, thereby increasing the availability of the complete field device network. The redundant PROFIBUS PA and redundant FOUNDATION Fieldbus H1 are available combined with single and redundant PROFIBUS DP networks.

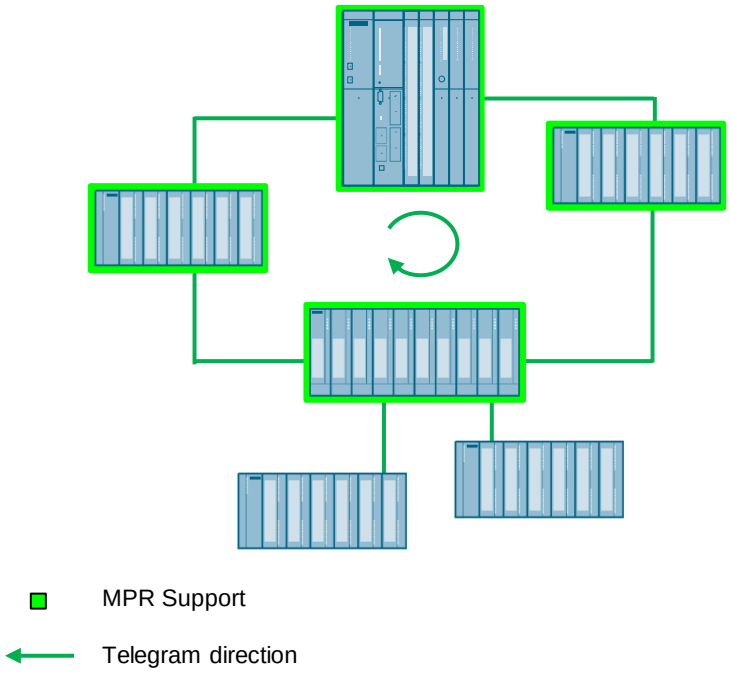
### Redundancy concept for PROFINET fieldbus

PROFINET makes available two redundancy concepts for the field level.

This includes the increase of availability of IO devices due to a ring topology with media redundancy (MRP). If the transmission link in the ring is interrupted at one point, for example, due to a break in the ring cable or the failure of a participant, the redundancy manager, e.g. the IO controller, immediately activates the alternative communication path.

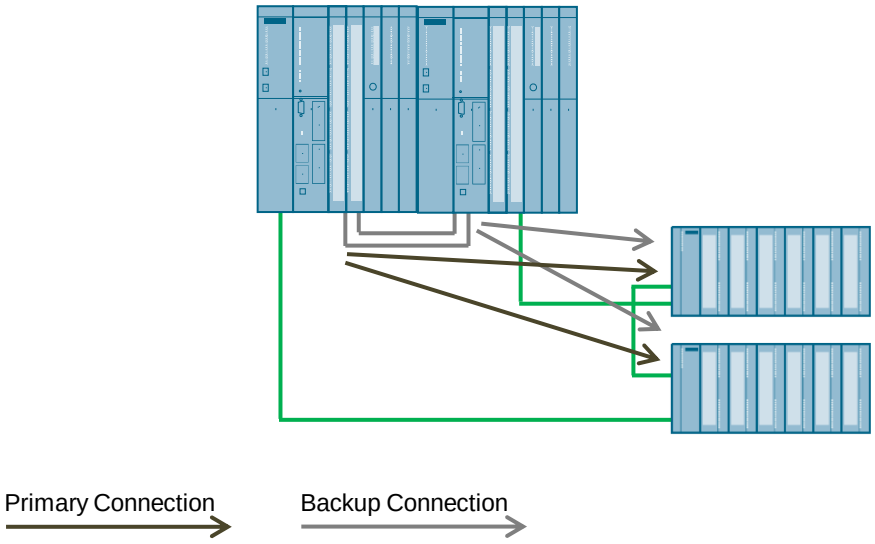
With a typical reconfiguration time of 200 ms and up to 50 PROFINET IO nodes in a ring, MRP behaves deterministically and is defined in the IEC 62439 standard.

### PROFINET with MRP



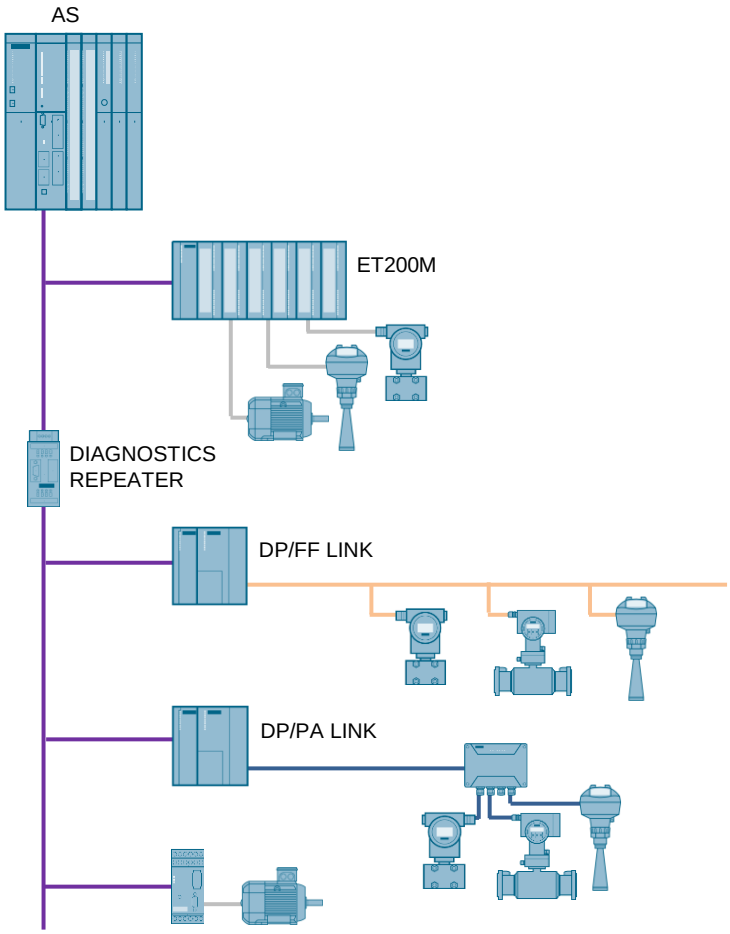

The second way to increase availability is by using system redundancy. In this case, communication connections are established between an IO device and both IO Controllers (active and backup CPUs) in a high-availability automation system (redundant IO controller). The active IO controller marks its output data as primary. IO nodes ignore output data which is not marked. This means that in the case of a failure, the backup CPU of the redundant automation system can take control over all the IO devices without interruptions by marking its output data as primary.

**PROFINET with system redundancy**



## 15.1 Single DP-PA / DP-FF fieldbus

In this configuration, the system has PROFIBUS DP, PROFIBUS PA, and FOUNDATION Fieldbus. The network transitions are implemented by means of a DP/PA link or a DP/FF link.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 1) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **ET200M** | | | | |
| 1 | | 6ES7654-0XX08-1XA0 | SIMATIC PCS 7 I/O SUBSYSTEM HOT SWAPPING, 8 I/O FOR ET200M | 2) |
| **DIAGNOSTICS REPEATER** | | | | |
| | 1 | 6ES7972-0AA02-0XA0 | SIMATIC DP, RS485 DIAGNOSTICS REPEATER | 2) |
| **DP/PA LINK** | | | | |
| 1 | | 6ES7153-2BA82-0XB0 | SIMATIC DP, INTERFACE DP/PA-LINK A. ET200M IM153-2 HF | 3) |
| 1 | | 6ES7157-0AC83-0XA0 | SIMATIC DP, FIELD DEVICE LINK DP/PA COUPLER FDC 157-0 NON EX-VERSION | 4) |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 482 MM | 5) |
| 1 | | 6ES7195-7HA00-0XA0 | SIMATIC DP, BUS UNIT FOR ET200M F. THE INTEGR.OF 1 PS A.1 IM153 | |
| 1 | | 6ES7195-7HF80-0XA0 | SIMATIC DP, BUS UNIT BM DP/PA FOR EXPANDED TEMPERATURE RANGE | |
| **FF LINK** | | | | |
| 1 | | 6ES7658-3MD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7-FF V9.0 (100 TAGS) | 7) |
| 1 | | On request | SIMATIC FF LINK, IM 153-2 FF | 6) |
| 1 | | 6ES7157-0AC83-0XA0 | SIMATIC DP, FIELD DEVICE LINK DP/PA COUPLER FDC 157-0 | |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 482 MM | |
| 1 | | 6ES7195-7HA00-0XA0 | SIMATIC DP, BUS UNIT FOR ET200M F. THE INTEGR.OF 1 PS A.1 IM153 | |
| 1 | | 6ES7195-7HF80-0XA0 | SIMATIC DP, BUS UNIT BM DP/PA FOR EXPANDED TEMPERATURE RANGE | |
| | | 24 V DC power supply | Redundant power supply with selective monitoring of the 24 V feeders | Section 18.3 |

**Note**

[1] Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

Notes regarding PROFIBUS DP:

- The maximum number of PROFIBUS DP slaves per master is 125 (typically 30 - 80)
- The maximum number of slaves per segment is 32, segments are separated from (diagnostics) repeaters

[2] ET200M, IM 153-2, diagnostics repeaters need a 24V DC power supply.

[3] Max. of 64 field devices per DP/PA Link, IM 153-2 needs a 24VDC power supply.

[4] Notes regarding FDC 157-0:

- Max. of 5 FDC 157-0 DP/PA couplers in a DP/PA link
- Max. of 31 field devices per FDC 157-0. (typically 20 - 25)
- The maximum current supplied from FDC 157-0 is 1,000 mA
- The maximum PA segment length is 1,900 m (typically 500 - 1,000 m)

[5] Longer lengths are available.

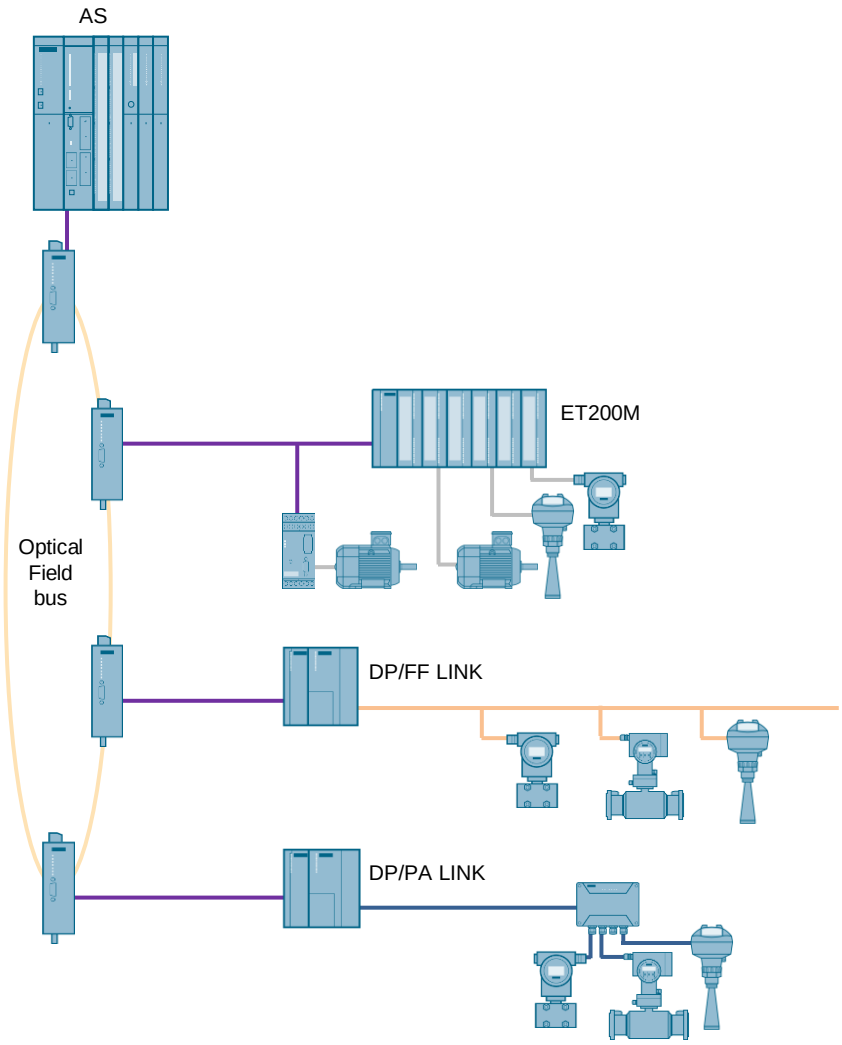
[6] Max. of 64 field devices per FF link (typically 8 - 12).

- Max. of 1 FDC 157-0 DP/FF coupler (or 2 in a ring) in one FF link
- Max. of 31 field devices per FDC 157. (typically 8 - 12)
- The maximum current supplied from FDC 157 is 1,000 mA
- The maximum FF segment length is 1,900 m (typically 500 - 1,000 m)

[7] With an existing PDM V9.0 license that includes routing, only one additional license is needed for FF communication. You can find this optional license in the PCS 7 catalog.

## 15.2 Single optical DP-PA / DP-FF fieldbus

This configuration is an optical PROFIBUS DP system with four optical link modules. The network transitions are implemented by means of a DP/PA link or a DP/FF link.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 1) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **OPTICAL FIELDBUS** | | | | |
| 4 | | 6GK1503-3CB00 | PROFIBUS OLM/G12 V4.0 OPTICAL LINK MODULE | 7) |
| **ET200M** | | | | |
| 1 | | 6ES7654-0XX08-1XA0 | SIMATIC PCS 7 I/O SUBSYSTEM HOT SWAPPING, 8 I/O FOR ET200M | 2) |
| **DP/PA LINK** | | | | |
| 1 | | 6ES7153-2BA82-0XB0 | SIMATIC DP, INTERFACE DP/PA-LINK A. ET200M IM153-2 HF | 3) |
| 1 | | 6ES7157-0AC83-0XA0 | SIMATIC DP, FIELD DEVICE LINK DP/PA COUPLER FDC 157-0 NON EX-VERSION | 4) |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 483 MM | 5) |
| 1 | | 6ES7195-7HA00-0XA0 | SIMATIC DP, BUS UNIT FOR ET200M F. THE INTEGR.OF 1 PS A.1 IM153 | |
| 1 | | 6ES7195-7HF80-0XA0 | SIMATIC DP, BUS UNIT BM DP/PA FOR EXPANDED TEMPERATURE RANGE | |
| **FF LINK** | | | | |
| 1 | | 6ES7658-3MD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7-FF V9.0 (100 TAGS) | 8) |
| 1 | | On request | SIMATIC FF LINK, IM 153-2 FF | |
| 1 | | On request | Field Device Coupler FDC 157 for SIMATIC FF link | |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 483 MM | 5) |
| 1 | | 6ES7195-7HA00-0XA0 | SIMATIC DP, BUS UNIT FOR ET200M F. THE INTEGR.OF 1 PS A.1 IM153 | |
| 1 | | 6ES7195-7HF80-0XA0 | SIMATIC DP, BUS UNIT BM DP/PA FOR EXPANDED TEMPERATURE RANGE | |
| | | 24 V DC power supply | Redundant power supply with selective monitoring of the 24 V feeders | Section 18.3 |

**Note**

[1] Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

Notes regarding PROFIBUS DP:

- The maximum number of PROFIBUS DP slaves per master is 125 (typically 30 - 80)
- The maximum number of slaves per segment is 32, segments are separated from (diagnostics) repeaters

[2] ET200M, IM 153-2, diagnostics repeaters need a 24V DC power supply.

[3] Max. of 64 field devices per DP/PA Link, IM 153-2 needs a 24VDC power supply.

[4] Notes regarding FDC 157-0:

- Max. of 5 FDC 157-0 DP/PA couplers in a DP/PA link
- Max. of 31 field devices per FDC 157-0. (typically 20 - 25)
- The maximum current supplied from FDC 157-0 is 1,000 mA
- The maximum PA segment length is 1,900 m (typically 500 - 1,000 m)

[5] Longer lengths are available.

[6] Max. of 64 field devices per FF link (typically 8 - 12).

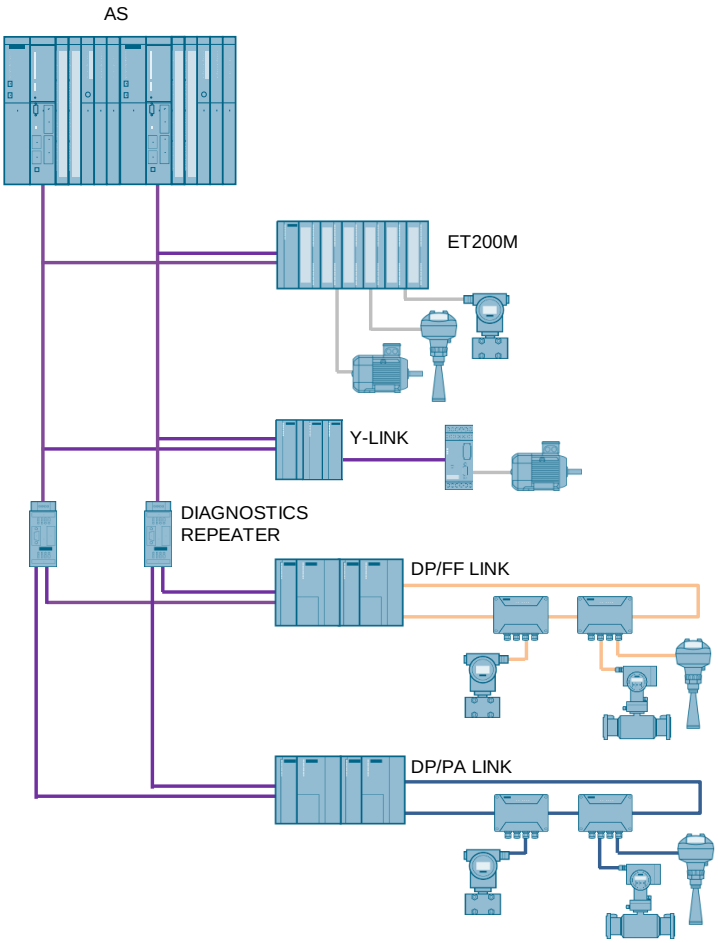
- Max. of 1 FDC 157-0 DP/FF coupler (or 2 in a ring) in one FF link
- Max. of 31 field devices per FDC 157. (typically 8 - 12)
- The maximum current supplied from FDC 157 is 1,000 mA
- The maximum FF segment length is 1900m (typically 500 - 1,000 m)

[7] OLM/G12 establishes a fault-tolerant PROFIBUS DP ring. OLM/G12 needs a 24 V DC power supply.

[8] With an existing PDM V9.0 license that includes routing, only one additional license is needed for FF communication. You can find this optional license in the PCS 7 catalog.

## 15.3 Redundant DP-PA / DP-FF fieldbus

This configuration is a redundant PROFIBUS DP system. The network transitions are also redundant with two DP/PA links or DP/FF links each.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7656-6CL33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 1) |
| | 2 | 6GK7443-5DX05-0XE0 | COMMUNICATION PROCESSOR CP443-5 EXTENDED | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **ET200M** | | | | |
| 1 | | 6ES7153-2AR03-0XA0 | SIMATIC DP, ET200M-RED.-BUNDLE CONSISTING OF TWO IM153-2HF | 3) |
| **Y LINK** | | | | |
| 1 | | 6ES7197-1LA11-0XA0 | SIMATIC S7-400H, Y-LINK FOR CONNECTING SINGLE-CHANNEL DP SLAVES TO S7-400H | 3) |
| **DIAGNOSTICS REPEATER** | | | | |
| | 2 | 6ES7972-0AA02-0XA0 | SIMATIC DP, RS485 DIAGNOSTICS REPEATER | 3) |
| **DP/PA LINK** | | | | |
| 2 | | 6ES7153-2BA82-0XB0 | SIMATIC DP, INTERFACE DP/PA-LINK A. ET200M IM153-2 HF | 4) |
| 2 | | 6ES7157-0AC83-0XA0 | SIMATIC DP, FIELD DEVICE LINK DP/PA COUPLER FDC 157-0 NON EX-VERSION | 5) |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 483 MM | 6) |
| 1 | | 6ES7195-7HD80-0XA0 | SIMATIC DP, BUS UNIT BM IM 157 FOR EXPANDED TEMPERATURE RANGE | |
| 1 | | 6ES7195-7HG80-0XA0 | SIMATIC DP, BUS COUPLE BM DP/PA FOR 2 FDC 157-0 FOR REDUNDANT OPERATION | |
| 2 | | 6ES7157-0AG81-0XA0 | ACT. FIELD DISTRIBUTOR AFD FOR PROFIBUS PA RING | |
| 1 | | 6ES7157-0AG80-1XA1 | 10 protective caps for the unused connections on AFD | |
| **Y-LINK and FF LINK** | | | | |
| | 1 | 6ES7658-3MD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7-FF V9.0 (100 TAGS) | 8) |
| 2 | | On request | SIMATIC FF LINK, IM 153-2 FF | 7) |
| 2 | | On request | Field Device Coupler FDC 157 for SIMATIC FF link | |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 483 MM | 6) |
| 1 | | 6ES7195-7HD80-0XA0 | SIMATIC DP, BUS UNIT BM IM 157 FOR EXPANDED TEMPERATURE RANGE | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6ES7195-7HG80-0XA0 | SIMATIC DP, BUS COUPLE BM DP/PA FOR 2 FDC 157-0 FOR REDUNDANT OPERATION | |
| 2 | | 6ES7157-0AG81-0XA0 | ACTIVE FIELD DISTRIBUTOR AFD4 FOR FF RING | |
| | | 24 V DC power supply | Redundant power supply with buffering | Section 18.5 |

**Note**

[1] Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

[2] Notes regarding CP443-5 Extended:

- The maximum number of PROFIBUS DP slaves per master is 125 (typically 30 - 80)
- The maximum number of slaves per segment is 32, segments are separated from (diagnostics) repeaters

[3] ET200M, IM 153-2, diagnostics repeaters need a 24V DC power supply.

[4] Max. of 64 field devices per DP/PA Link, IM 153-2 needs a 24VDC power supply.

[5] Notes regarding FDC 157-0:

- Max. of one pair of redundant FDC 157-0s per DP/PA link and 3 single FDC 157-0s
- Max. of 31 field devices per redundant pair of FDC 157-0 (typically 20 - 25)
- The maximum current supplied from FDC 157-0 is 1,000 mA
- The maximum PA segment length is 1,900 m (typically 500 - 1,000 m)

[6] Longer lengths are available.

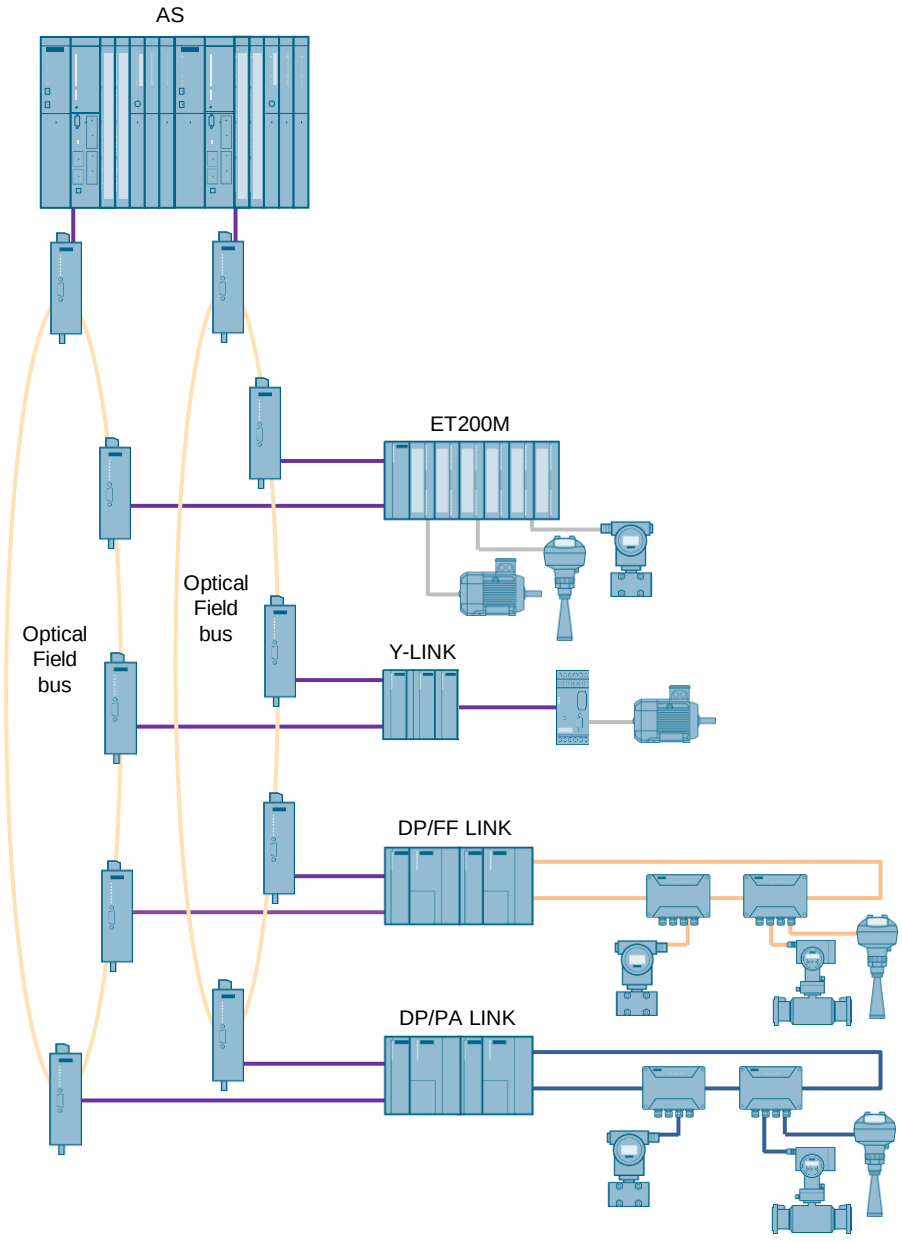
[7] Max. of 64 field devices per FF link (typically 8 - 12).

- Max. of 1 FDC 157-0 DP/FF coupler (or 2 in a ring) in one FF link
- Max. of 31 field devices per FDC 157 (typically 8 - 12)
- The maximum current supplied from FDC 157 is 1,000 mA
- The maximum FF segment length is 1900m (typically 500 - 1,000 m)

[8] With an existing PDM V9.0 license that includes routing, only one additional license is needed for FF communication. You can find this optional license in the PCS 7 catalog.

## 15.4 Redundant optical DP-PA / DP-FF fieldbus

This configuration is a redundant, optical PROFIBUS DP system with optical link modules. The network transitions are also redundant with two DP/PA links or DP/FF links each.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7656-6CL33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 1) |
| | 2 | 6GK7443-5DX05-0XE0 | COMMUNICATION PROCESSOR CP443-5 EXTENDED | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **OPTICAL FIELDBUS** | | | | |
| 10 | | 6GK1503-3CB00 | PROFIBUS OLM/G12 V4.0 OPTICAL LINK MODULE | 8) |
| **ET200M** | | | | |
| 1 | | 6ES7153-2AR03-0XA0 | SIMATIC DP, ET200M-RED.-BUNDLE CONSISTING OF TWO IM153-2HF | 3) |
| **Y LINK** | | | | |
| 2 | | 6ES7197-1LA11-0XA0 | SIMATIC S7-400H, Y-LINK FOR CONNECTING SINGLE-CHANNEL DP SLAVES TO S7-400H | 3) |
| **DP/PA LINK** | | | | |
| 2 | | 6ES7153-2BA82-0XB0 | SIMATIC DP, INTERFACE DP/PA-LINK A. ET200M IM153-2 HF | 4) |
| 2 | | 6ES7157-0AC83-0XA0 | SIMATIC DP, FIELD DEVICE LINK DP/PA COUPLER FDC 157-0 NON EX-VERSION | 5) |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 483 MM | 6) |
| 1 | | 6ES7195-7HD80-0XA0 | SIMATIC DP, BUS UNIT BM IM 157 FOR EXPANDED TEMPERATURE RANGE | |
| 1 | | 6ES7195-7HG80-0XA0 | SIMATIC DP, BUS COUPLE BM DP/PA FOR 2 FDC 157-0 FOR REDUNDANT OPERATION | |
| 2 | | 6ES7157-0AG81-0XA0 | ACTIV- FIELD DISTRIBUTOR AFD4 FOR PROFIBUS PA RING | |
| 1 | | 6ES7157-0AG80-1XA1 | 10 protective caps for the unused connections on AFD | |
| **FF LINK** | | | | |
| | 1 | 6ES7658-3MD58-0YA5 | SOFTWARE SIMATIC PDM PCS 7-FF V9.0 (100 TAGS) | 9) |
| 2 | | On request | SIMATIC FF LINK, IM 153-2 FF | 7) |
| 2 | | On request | Field Device Coupler FDC 157 for SIMATIC FF link | |
| 1 | | 6ES7195-1GA00-0XA0 | SIMATIC DP, RAIL FOR ET 200M 483 MM | 6) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6ES7195-7HD80-0XA0 | SIMATIC DP, BUS UNIT BM IM 157 FOR EXPANDED TEMPERATURE RANGE | |
| 1 | | 6ES7195-7HG80-0XA0 | SIMATIC DP, BUS COUPLE BM DP/PA FOR 2 FDC 157-0 FOR REDUNDANT OPERATION | |
| 2 | | 6ES7157-0AG81-0XA0 | ACTIVE FIELD DISTRIBUTOR AFD4 FOR FF RING | |
| | | 24 V DC power supply | Redundant power supply with buffering | Section 18.5 |

**Note**

[1] Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

[2] Notes regarding CP443-5 Extended:

- The maximum number of PROFIBUS DP slaves per master is 125 (typically 30 - 80)
- The maximum number of slaves per segment is 32, segments are separated from (diagnostics) repeaters

[3] ET200M, IM 153-2, diagnostics repeaters need a 24V DC power supply.

[4] Max. of 64 field devices per DP/PA Link, IM 153-2 needs a 24VDC power supply.

[5] Notes regarding FDC 157-0:

- Max. of 5 FDC 157-0 DP/PA couplers in a DP/PA link
- Max. of 31 field devices per FDC 157-0 (typically 20 - 25)
- The maximum current supplied from FDC 157-0 is 1,000 mA
- The maximum PA segment length is 1,900 m (typically 500 - 1,000 m)

[6] Longer lengths are available.

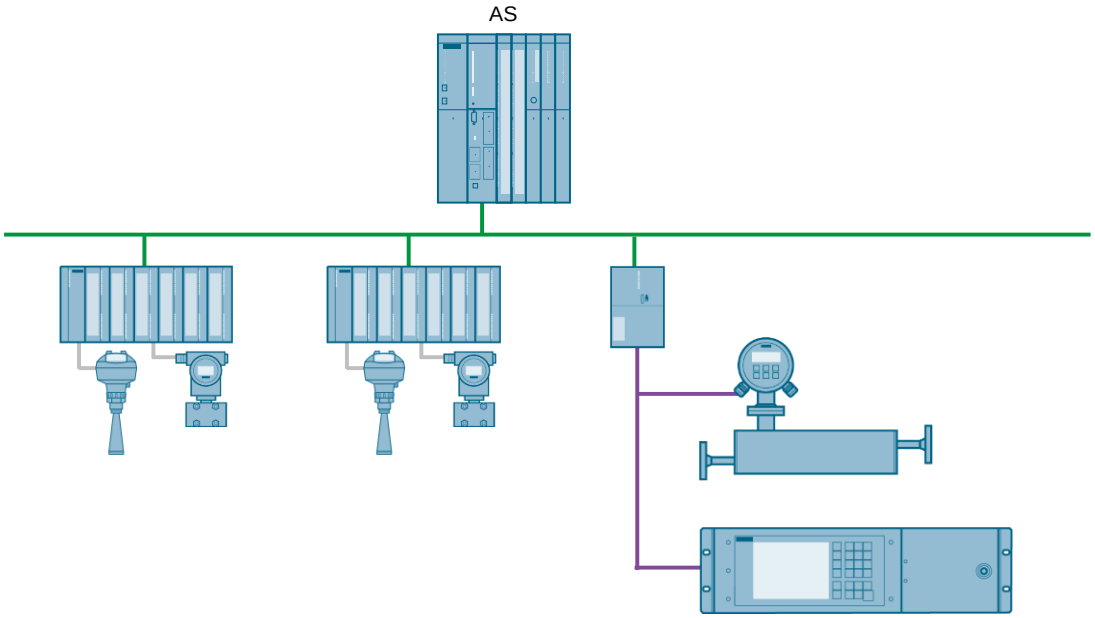
[7] Max. of 64 field devices per FF link (typically 8 - 12).

- Max. of 1 FDC 157-0 DP/FF coupler (or 2 in a ring) in one FF link
- Max. of 31 field devices per FDC 157 (typically 8 - 12)
- The maximum current supplied from FDC 157 is 1,000 mA
- The maximum FF segment length is 1900m (typically 500 - 1,000 m)

[8] OLM/G12 establishes a fault-tolerant PROFIBUS DP ring. OLM/G12 needs a 24V DC power supply.

[9] With an existing PDM V9.0 license that includes routing, only one additional license is needed for FF communication. You can find this optional license in the PCS 7 catalog.

## 15.5 PROFINET IO fieldbus of a single automation system




**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, SYSTEM EXPANSIONS CARD 500 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, UC 120/230V 10A POWER SUPPLY | 1) 3) 4) 5) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **ET200M** | | | | |
| 2 | | 6ES7153-4BA00-0XB0 | SIMATIC ET 200M (IM 153-4 PN HF) | 2) 5) |
| | | 24 V DC power supply | Redundant power supply with selective monitoring of the 24 V feeders | Section 18.3 |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Network components** | | | | |
| 1 | | 6GK1411-5AB00 | IE/PB Link PN IO | 6) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.
On H CPUs, the PROFINET IO network can only be operated on the internal Ethernet interface. Operation is not possible on the external Ethernet CP443-1EX30.

2) ET200M, IM 153-2xxx 24V DC power supply.

3) Max. of 5 CPs with max. of 128 IO devices per CP interface.

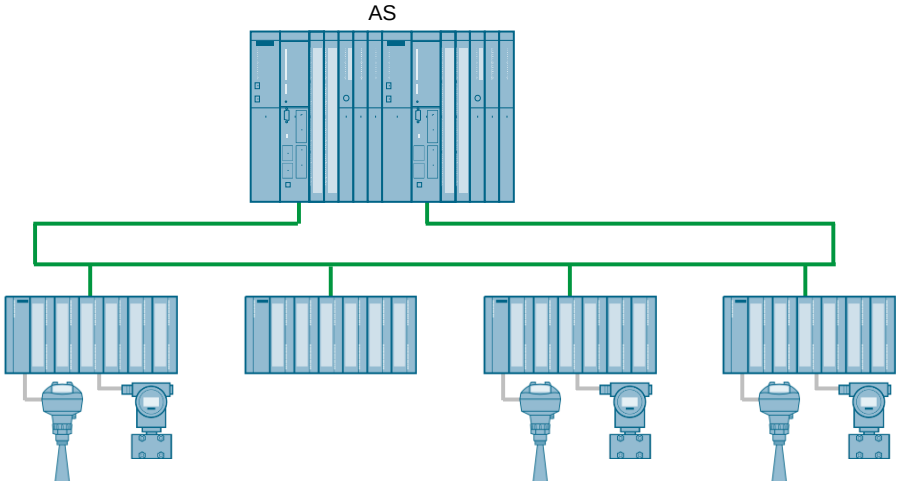
4) Max. of 250 IO devices per onboard CPU interface.

5) Max. of 50 PROFINET IO devices in an MRP ring that includes ET200M, SCALANCE X, CPU, and CPs.

6) PROFIBUS DP devices and lower-level PROFIBUS PA nodes (PA couplers) are only supported by compact devices.

## 15.6 PROFINET IO fieldbus in a high-availability automation system

On H systems, the PROFINET IO network can only be operated on the internal Ethernet interface. Operation is not possible on the external Ethernet CP443-1EX30. The PROFINET IO network is operated with system redundancy as an "open Ethernet ring" (system-redundant line) to increase availability of the remote IO stations. It is also possible to set up the H system within a closed ring (node in MRP).




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7656-6CL33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULES, 2X PROFINET-IO, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULES AND 2 X 1M FO, 2 X CP443-1 | 1) 2) 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **ET200M** | | | | |
| 4 | | 6ES7153-4BA00-0XB0 | SIMATIC ET 200M (IM 153-4 PN HF) | 3) |
| | | 24 V DC power supply | Redundant power supply with buffering | Section 18.5 |

**Note**

1) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

2) Only devices that support system redundancy can be operated on a redundant basis on the H system. Devices that do not support system redundancy can only be assigned to one H CPU.

3) ET200M, IM 153-2xxx 24V DC power supply.

4) Max. of 250 IO devices per onboard CPU interface.

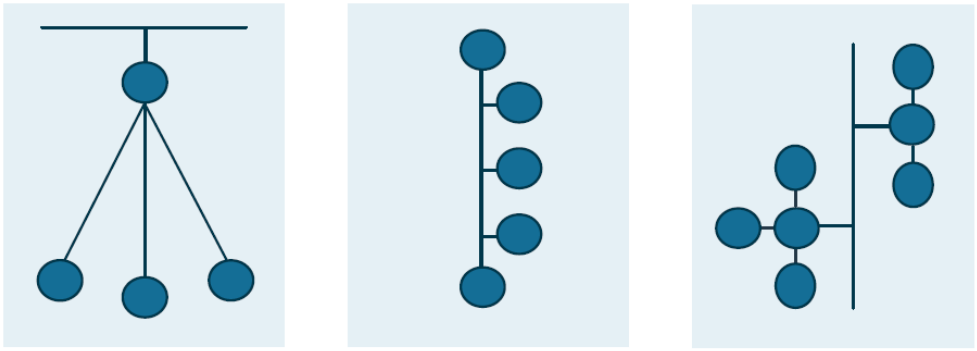
# 16 Network architecture

## 16.1 Overview

**Star, line, and tree structures**

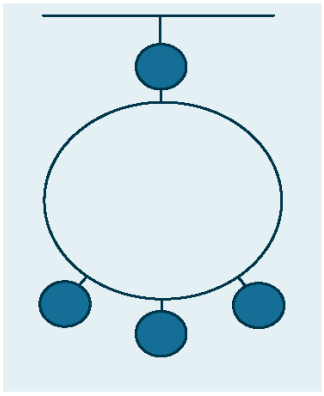
The rugged SCALANCE network components, active, and managed switches can be used to build cost-effective network topologies for a large number of nodes.

SCALANCE offers a wide range of network components to create star, line and tree structures with a large number of ports. If multiple switches are needed to ensure a high number of ports or to allow the spatial distribution of the switches, then we suggest that you connect the switches as a fault-tolerant ring to ensure appropriate availability.



### Fault-tolerant ring

A unique redundancy manager concept enables the administration of several SCALANCE switch faults in a ring backbone for optical, electrical or mixed media process without interrupting the network communication. This ability can be found in the complete series of SCALANCE switches (from SCALANCE X200), supplied with SIMATIC PCS 7.

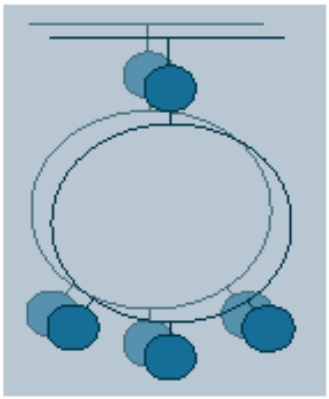


Ring



### Double redundant bus

SIMATIC PCS 7 provides redundancy from the OS client client right through to the field connection. Network communication between the OS clients and OS servers as well as between OS servers and the AS can reach the highest level of availability when each PC and the automation system (two network interfaces per PC and AS) are connected in a ring structure to the separate fault-tolerant network.



### Combined systems and terminal bus

When using a common (combined) plant and terminal bus, pay attention to the article entitled "What are the requirements for operating PCS 7 via common plant and terminal buses?"

The use of VLAN (Virtual Local Area Network) technology makes it possible to split a physical network into logical networks. The use of VLAN allows the system bus and the terminal bus to operate together on one physical network.

**Note** For more information about configuration of a combined plant and terminal bus, refer to the entry entitled "How do you configure a Virtual Local Area Network (VLAN) in PCS 7?"

### Backbone networks with 1 to 10 Gbits of bandwidth

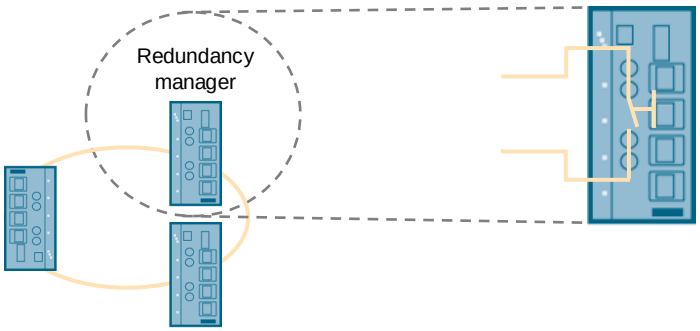
In the case of applications in which you need to to transfer large amounts of data across the backbone network, SCALANCE offers switches with a bandwidth of between 1 and 10 Gbits. These high-performance switches deliver the functionality of redundancy management, which makes it possible to set up fault-tolerant ring topologies with single or double redundancy.

## 16.2 Ring architectures

### High-speed ring fault tolerance

High Speed Redundancy Protocol (HRP) fault tolerant SCALANCE rings are used to form multiple communication paths between switches. This means that if one of the paths fails the backup path is activated to ensure communication. Unlike "spanning-tree" technology, which provides similar functionality, SCALANCE switches reconfigure the existing communication paths fast enough to avoid connected systems (controllers, servers, clients) suffering a loss of communication. High-speed ring monitoring and reconfiguration is achieved by a SCALANCE switch assuming the role of redundancy manager.

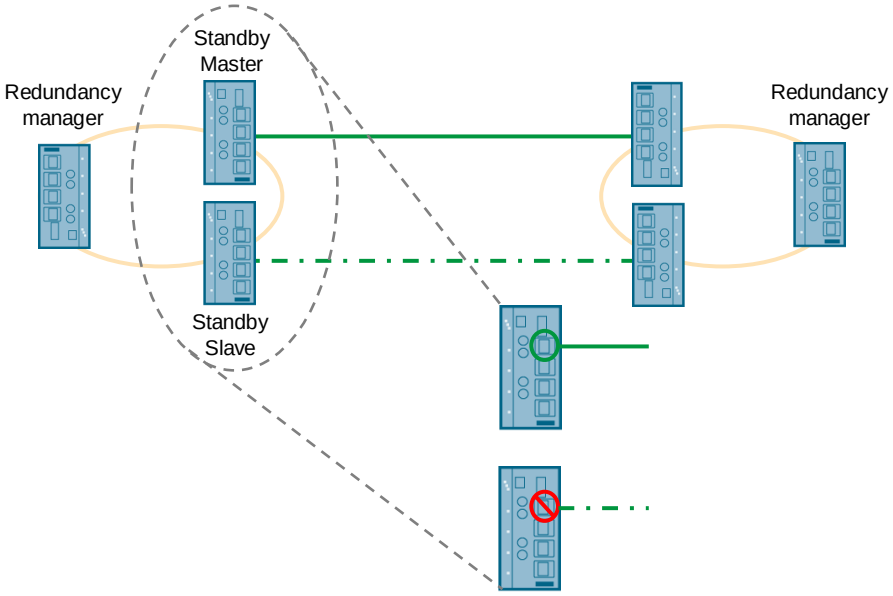
Ring connections between switches can be made via electrical or optical cable connections.




The redundancy manager acts as a switch that opens the Ethernet ring at a predetermined position and controls the cable status. If an error occurs in the cable, the redundancy manager recognizes this, closes the switch, and re-establishes communication.

## Ring connectivity, standby redundancy

To connect two separate fault-tolerant Ethernet rings on a redundant basis, there is a second high-speed redundancy function. Although it is necessary to have two connections between the rings for redundancy, only one connection can be active in each case. To achieve this, one of the two rings to be coupled is fitted with two switches that support this stand-by redundancy. In this concept, two parallel point-to-point connections monitor each other to ensure that the stand-by connection is activated when the active link fails. This is achieved by configuring a SCALANCE switch as the standby master and a second SCALANCE switch as the standby slave.




The standby master and standby slave are logically linked. The standby master activates its link and the standby slave deactivates its own link. Both switches monitor each other's status and the standby slave becomes active if the active connection fails. The process of activating the standby slaves happens so fast that there is no breakdown in communication between the connected systems (controllers, servers, clients).

# 16.3 Redundancy concepts - terminal bus

## 16.3.1 Introduction

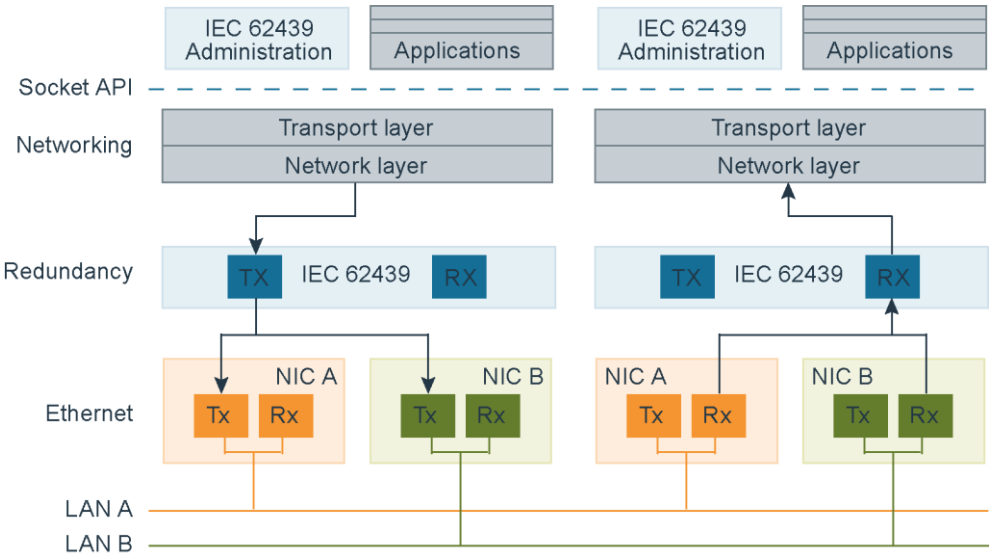
OS servers and clients as well as Engineering Systems, BATCH servers/clients, Route Control servers/clients and Central Archive servers can be fitted with a redundant terminal bus connection. In principle, the structure of this redundant, highly available terminal bus uses the SIMATIC NET SOFTNET-IE RNA software. This software is based on the Parallel Redundancy Protocol (PRP) as per IEC 62439-3.

### SIMATIC NET IE RNA

At each PC station, two of the physically present network cards are also combined into one logical network card.

Only the logical network card that has one IP and MAC address is visible to the operating system and the network. Both network cards operate internally using the Parallel Redundancy Protocol (PRP).

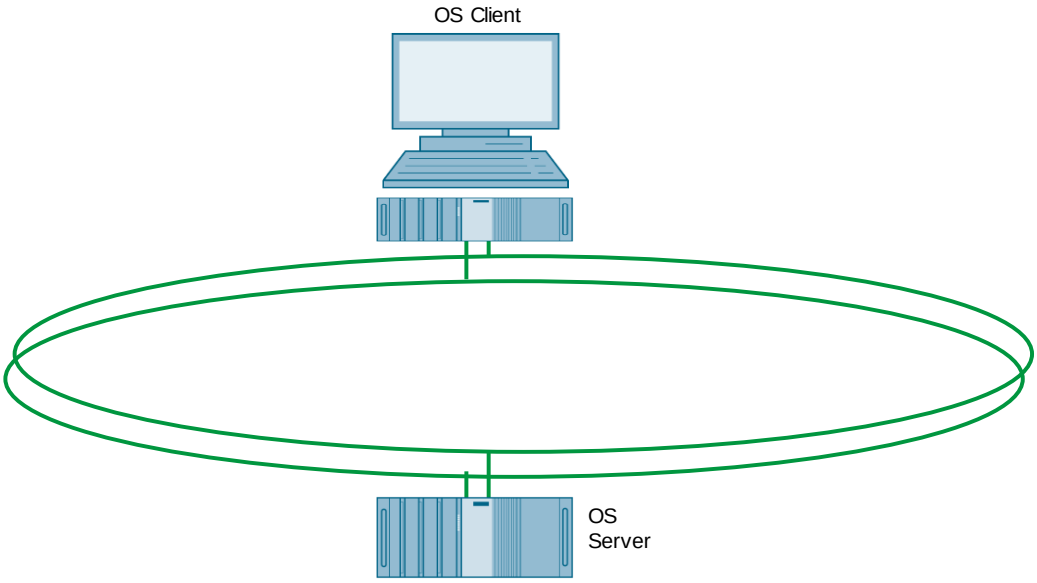
The data packets are transmitted in-parallel via both network cards. The first incoming message frame is processed at the receiver end. The message frame sent in-parallel is discarded. A (double) redundant network without connection between the Ethernet rings must be used due to the parallel data transmission. Due to the parallel transmission, if an error occurs there is a 0 ms switchover time.



### 16.3.2 Redundant terminal bus

**SIMATIC NET SOFTNET IE-RNA redundant network**

- Redundant terminal bus connection in every server and client
- (double) redundant fault-tolerant ring network






**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Operator System server** | | | | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 1) 2) |
| **Operator System client** | | | | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 1) 2) |

**Note**

SCALANCE switch and network components must be added; see the descriptions of the network topology in this chapter to select the appropriate configuration and components.

1) The onboard interfaces can be used

2) Single License for one installation

# 16.4 Redundancy concept for plant bus

## 16.4.1 Introduction

Besides the fault-tolerant ring and double ring concepts described above, PCS 7 also provides flexible redundancy solutions for communication via the plant bus between OS and AS (controllers). For redundant communication, SIMATIC S7-400H CPUs (single or redundant), SCALANCE X network components, and the CP1623/1628 communications processor, or corresponding standard network cards (BCE) with the “SIMATIC NET SOFTNET-IE S7 REDCONNECT VM” software are assumed for the computers that are involved.

## 16.4.2 Single automation system

Single-user AS 410-5H systems consist of one S7-410-5H CPU. From firmware (FW) V8.1 of the S7-410-5H CPU onward, redundant communication between the two onboard interfaces is supported. Using FW V8.0, only one of the two onboard interfaces is supported.

**Note** The update file for upgrading the CPU 410-5H firmware is in the following entry:

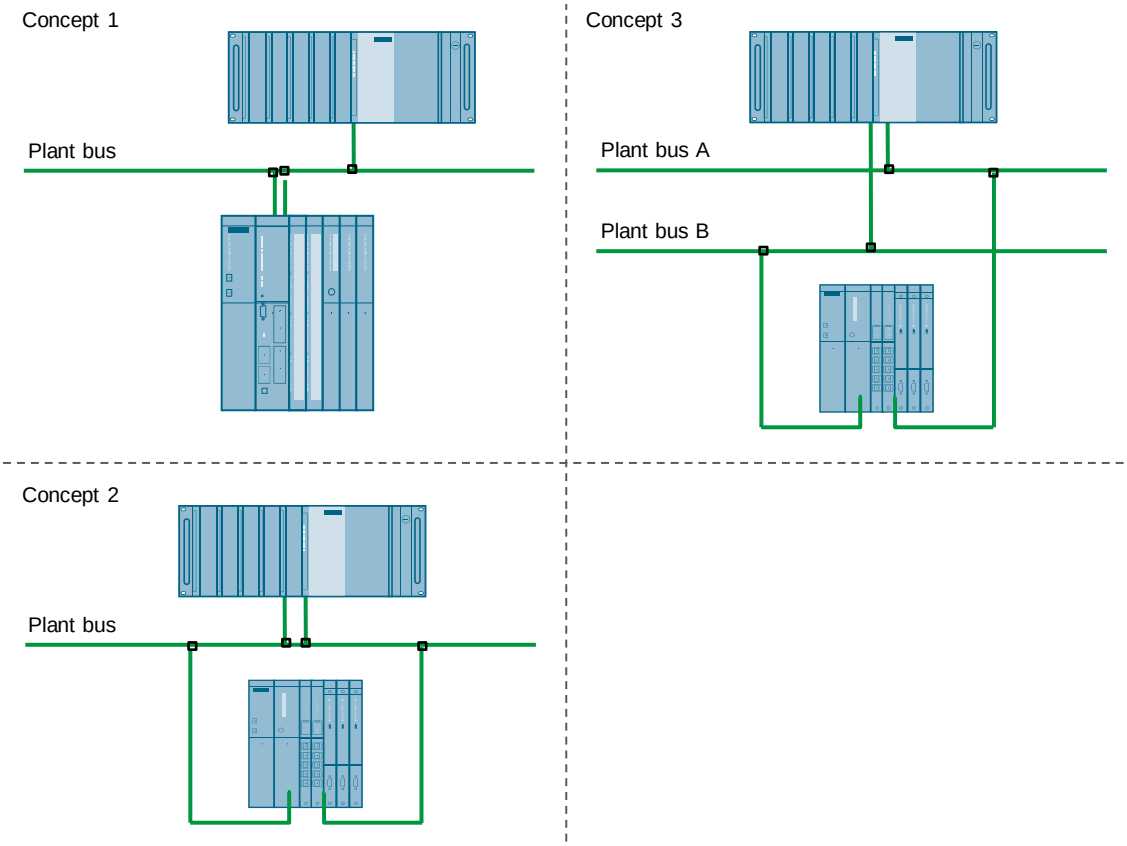
https://support.industry.siemens.com/cs/ww/en/view/109476571

To support redundant communication with FW V8.0, you can equip a station with two CP443-1 Ethernet communications processors. The table below shows the different redundancy configurations.

- Concept 1, single network, single OS server/single-user network connection, two communication paths
  - one CP1623 in the OS server, single-user
  - two CP443-1 communications processors or onboard Ethernet interface
  - star network or fault-tolerant ring

- Concept 2, single network, redundant OS server/single-user network connection, two communication paths
  - two CP1623 in the OS server, single-user
  - two CP443-1 communications processors or onboard Ethernet interface
  - star network or fault-tolerant ring

- Concept 3, (double) redundant network, redundant OS server/single-user network connection, two communication paths
  - two CP1623 in the OS server, single-user
  - two CP443-1 communications processors or onboard Ethernet interface
  - double fault-tolerant ring






**Bill of material for concept 1**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL04-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 1) |
| **Engineering System and Operator System** | | | | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 2) |

**Bill of materials for concepts 2 and 3**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CL04-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | |
| **Engineering System and Operator System** | | | | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1)<br>2) |

**Note**

SCALANCE switch and network components must be added; see the descriptions of the network topology in this chapter to select the appropriate configuration and components.

1) REDCONNECT upgrade and CP1623 are needed for each Operator System and Engineering System that is integrated in the system bus.

2) The bill of material is based on the assumption that the selected Operator System and Engineering System hardware is equipped with a CP1623 (industrial Ethernet version of the hardware); only additional CP1623 communications processors are listed.



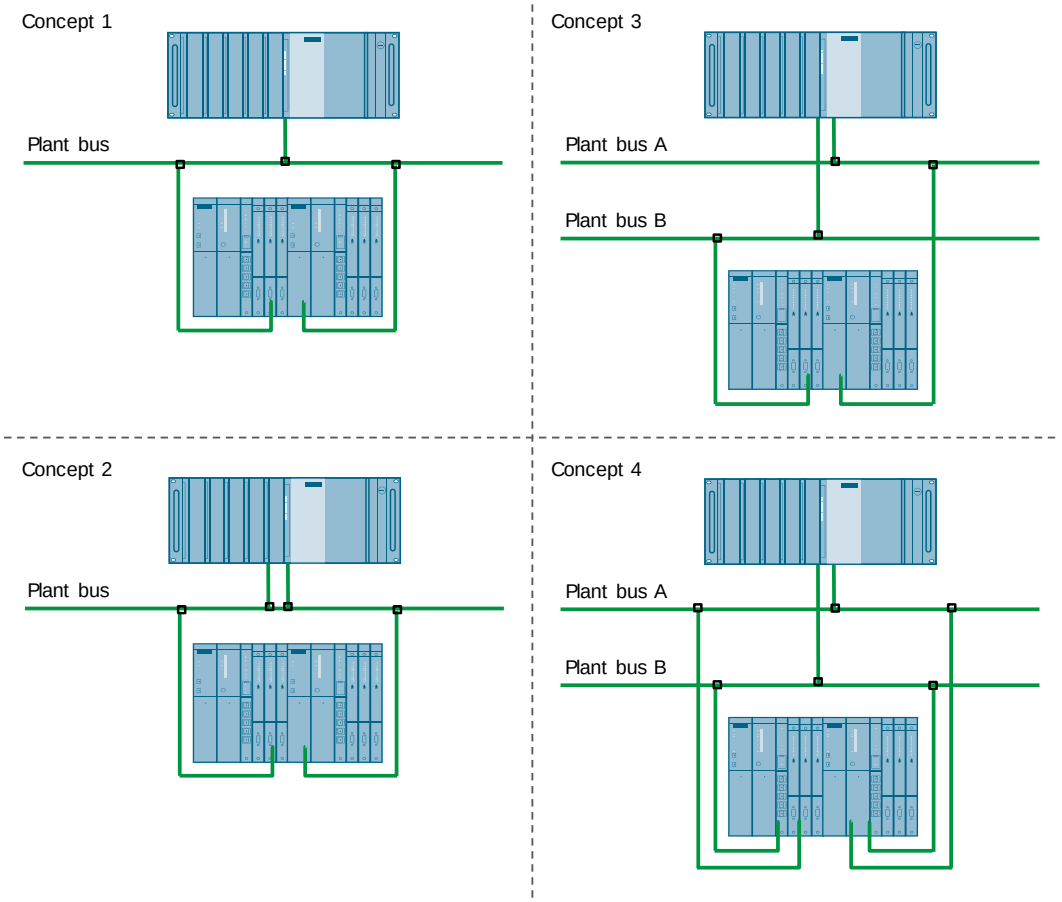
### 16.4.3 Redundant AS 410-5H automation system

Redundant AS 410-5H automation systems consist of two redundant 410-5H CPUs. From Firmware V8.1 onward, you can use the onboard interfaces for communication or fit the 410-5H CPUs with two redundant CP443-1 or four redundant CP443-1 communications processors. The table below shows the different redundancy configurations:

- Concept 1, single network, single OS server/single-user network connection, two communication paths
  - one CP1623 in the OS server, single-user
  - two CP443-1 communications processors or onboard Ethernet interface
  - star network or fault-tolerant ring
- Concept 2, single network, redundant OS server/single-user network connection, four communication paths
  - two CP1623 in the OS server, single-user
  - two CP443-1 communications processors or onboard Ethernet interface
  - star network or fault-tolerant ring

- Concept 3, (double) redundant network, redundant OS server/single-user network connection, two communication paths
  - two CP1623 in the OS server, single-user
  - two CP443-1 communications processors or onboard Ethernet interface
  - (double) redundant fault-tolerant rings

- Concept 4, (double) redundant network, redundant OS server/single-user network connection, four communication paths
  - two CP1623 in the OS server, single-user
  - two CP443-1 communications processors or onboard Ethernet interface
  - (double) redundant fault-tolerant rings



### Bill of material for concept 1

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7656-6CL33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, 2 X CP443-1IE, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 3) |
| **Engineering System and Operator System** | | | | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |

### Bill of materials for concepts 2 and 3

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7656-6CL33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, 2 X CP443-1IE, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 3) |
| **Engineering System and Operator System** | | | | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1)<br>2) |

### Bill of material for concept 4

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7656-6CL34-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, 2x2 CP443-1IE, SYSTEM EXPANSION CARD 500 PO, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND 2 X 1M FO, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | |
| **Engineering System and Operator System** | | | | |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 1) |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1)<br>2) |

**Note**

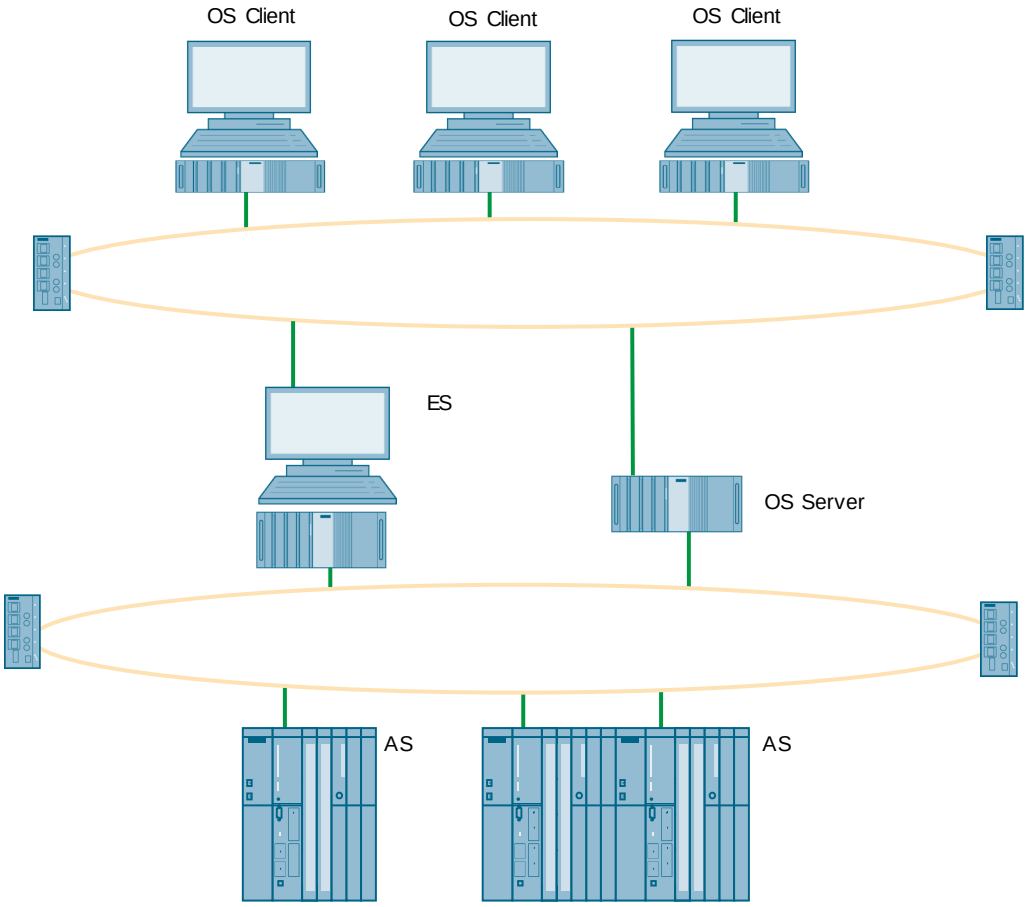
SCALANCE switch and network components must be added; see the descriptions of the network topology in this chapter to select the appropriate configuration and components.

1) REDCONNECT upgrade and CP1623 are needed for each Operator System and Engineering System that is integrated in the system bus.

2) The bill of material is based on the assumption that the selected Operator System and Engineering System hardware is equipped with a CP1623 (industrial Ethernet version of the hardware); only additional CP1623 communications processors are listed.

3) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 16.5 Fault-tolerant ring architectures in fiber-optic cable

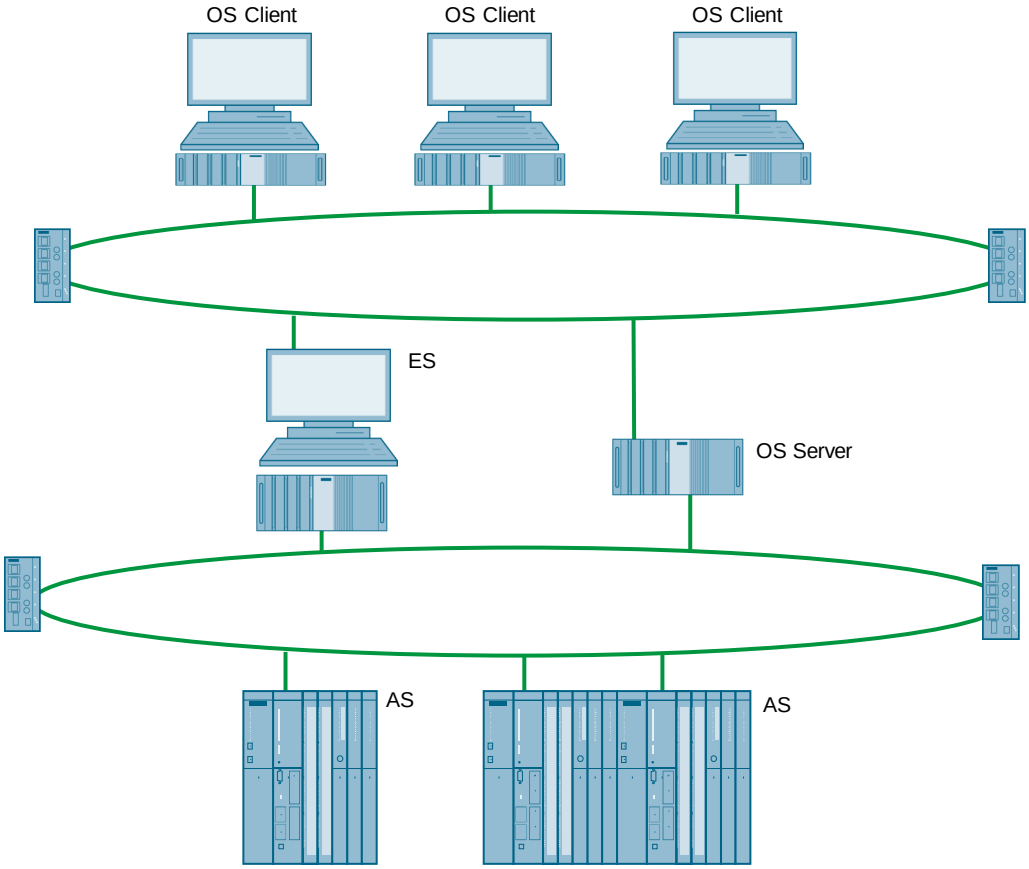


### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Terminal bus** | | | | |
| 2 | | 6GK5204-2BB10-2AA3 | SIMATIC NET SCALANCE X204-2, MANAGED IE SWITCH, 4 X 10/100MBIT/S | [1] |
| 2 | | 6XV1820-5BN10 | SIMATIC NET, FIBER OPTIC CABLE, 4 BFOC CONNECTORS, 10M | |
| 5 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **Plant bus** | | | | |
| 2 | | 6GK5204-2BB10-2AA3 | SIMATIC NET SCALANCE X204-2, MANAGED IE SWITCH, 4 X 10/100MBIT/S | [1] |
| 2 | | 6XV1820-5BN10 | SIMATIC NET, FIBER OPTIC CABLE, 4 BFOC CONNECTORS, 10M | |
| 6 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note** [1] SCALANCE switch needs a 24V DC power supply.

## 16.6 Electrical fault-tolerant ring architectures

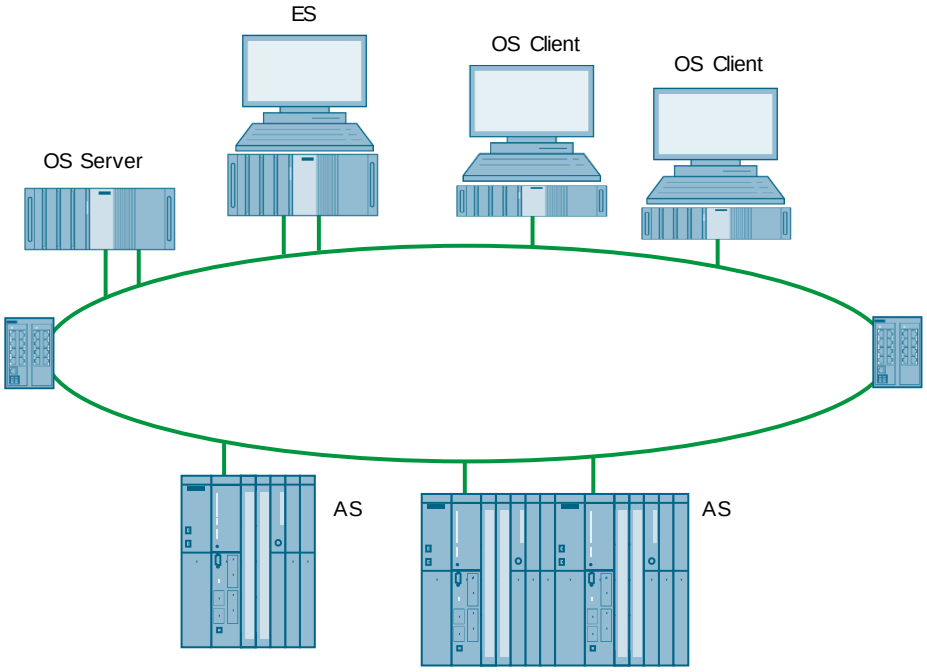


### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Terminal bus** | | | | |
| 2 | | 6GK5208-0BA10-2AA3 | SIMATIC NET SCALANCE X208, MANAGED IE SWITCH, 8 X 10/100MBIT/S | [1] |
| 7 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **Plant bus** | | | | |
| 2 | | 6GK5208-0BA10-2AA3 | SIMATIC NET SCALANCE X208, MANAGED IE SWITCH, 8 X 10/100MBIT/S | [1] |
| 8 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note** [1] SCALANCE switch needs a 24V DC power supply.

## 16.7 Electrical fault-tolerant ring structures with combined plant and terminal bus

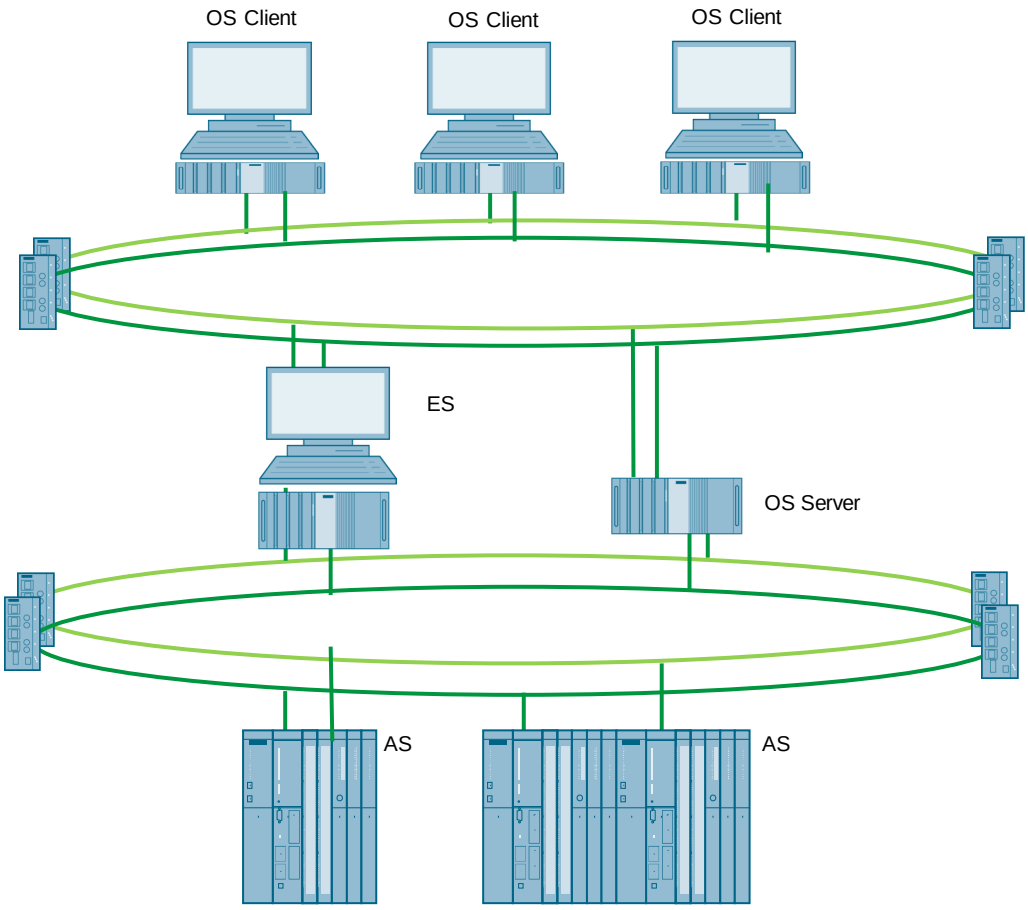



**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Shared plant and terminal bus** | | | | |
| 2 | | 6GK5216-0BA00-2AA3 | SIMATIC NET SCALANCE X216, MANAGED IE SWITCH, 16 X 10/100MBIT/S | [1] |
| 11 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note** [1] SCALANCE switch needs a 24V DC power supply.

## 16.8 (Double) redundant bus architectures

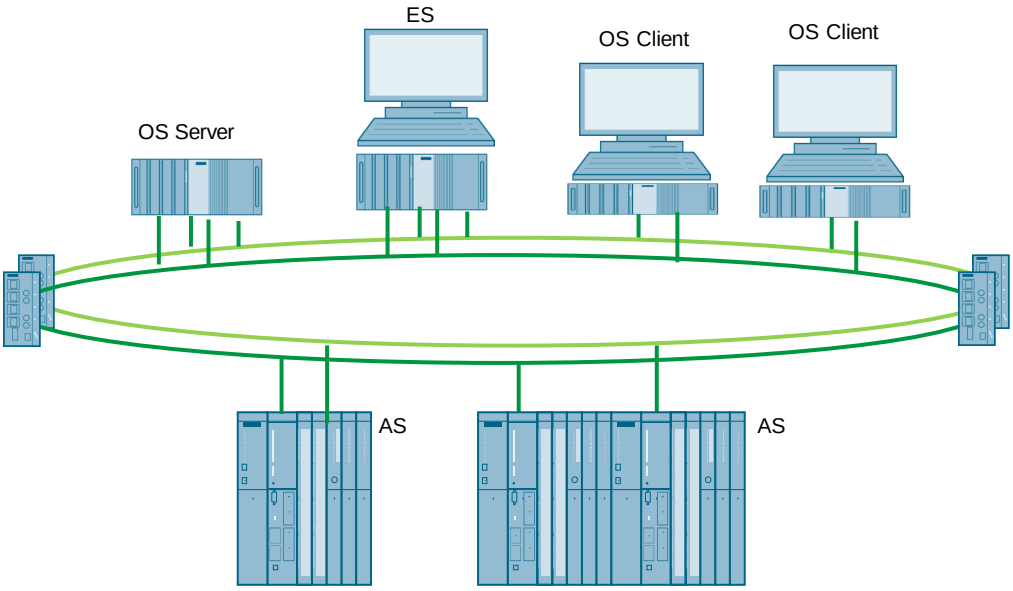


### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Terminal bus** | | | | |
| 4 | | 6GK5204-2BB10-2AA3 | SIMATIC NET SCALANCE X204-2, MANAGED IE SWITCH, 4 X 10/100MBIT/S | [1] |
| 4 | | 6XV1820-5BN10 | SIMATIC NET, FIBER OPTIC CABLE, 4 BFOC CONNECTORS, 10M | |
| 12 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |
| **Plant bus** | | | | |
| 4 | | 6GK5204-2BB10-2AA3 | SIMATIC NET SCALANCE X204-2, MANAGED IE SWITCH, 4 X 10/100MBIT/S | [1] |
| 4 | | 6XV1820-5BN10 | SIMATIC NET, FIBER OPTIC CABLE, 4 BFOC CONNECTORS, 10M | |
| 8 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note** [1] SCALANCE switch needs a 24V DC power supply.

## 16.9 (Double) redundant bus architectures with combined plant and terminal buses






**Parts list**

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Combined plant and terminal bus** | | | | |
| 4 | | 6GK5212-2BB00-2AA3 | SIMATIC NET SCALANCE X212-2, MANAGED IE SWITCH, 12 X 10/100MBIT/S | 1) |
| 4 | | 6XV1820-5BN10 | SIMATIC NET, FIBER OPTIC CABLE, 4 BFOC CONNECTORS, 10M | |
| 20 | | 6XV1870-3QH60 | SIMATIC NET INDUSTRIAL ETHERNET TP CORD CABLE RJ45/RJ45, 6M | |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note** 1) SCALANCE switch needs a 24V DC power supply.

# 17 Process safety

### Process safety for single-user stations

Safety Instrumented Systems are based on the proven SIMATIC PCS 7 Safety System technology. Like all the other architectures in SIMATIC PCS 7, the architecture of Safety Systems is scalable from small to large systems and offers the complete functionality for every size. The SIMATIC PCS 7 Single-user Safety System includes the functionality for engineering, operation and control of an entire Safety Instrumented System in a fail-safe automation system. The fail-safe Safety System is configured using CFC logic or the Safety Matrix. The Safety Matrix is a cause & effect engineering tool with the addition of a visualizing component. The Safety Matrix can be used independently and also as an integrated component of the Engineering System.

### Client/server

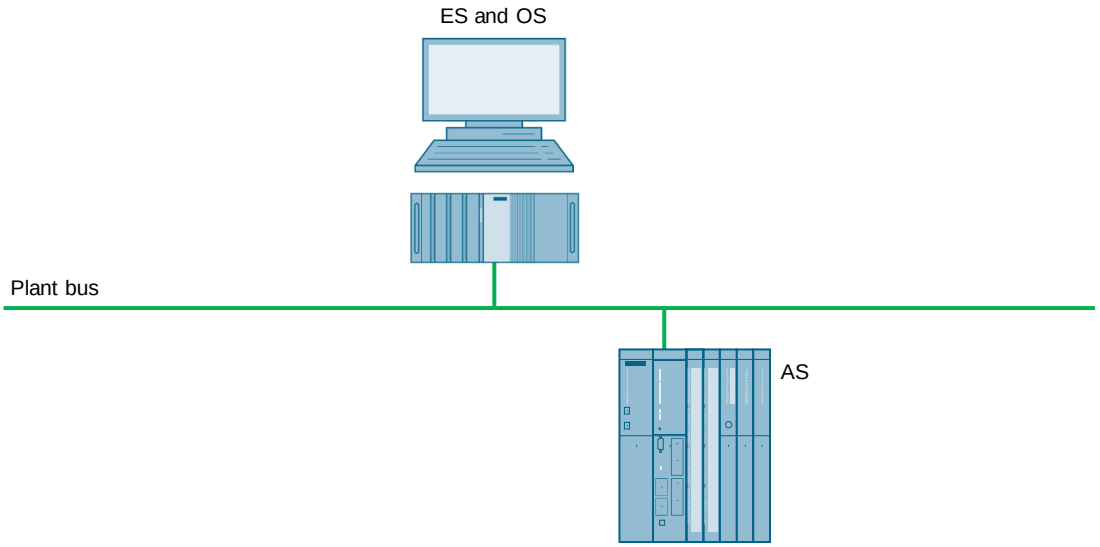
Medium to large systems are implemented by connecting standard systems and safety automation systems to an OS server. The engineering, operation, and control functions are distributed via the Engineering and Operator System PCs.

### Redundant client/server

High-availability of operation and control functionalities is achieved through redundant OS servers and high-availability automation systems.

## 17.1 Single-user system with Process Safety

This configuration is a system in which the ES and OS are used as a single-user system on one PC.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station and Operator Station** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7651-5AA28-0YA0 | SIMATIC PCS 7, SOFTWARE, ES SINGLE STATION V8.2 (AS/OS: PO 250) | 1) |
| 1 | | 6ES7833-1CC02-0YA5 | SOFTWARE SIMATIC S7, F-PROG-SW ENG | |
| | 1 | 6ES7833-1SM02-0YA5 | SOFTWARE SIMATIC SAFETY MATRIX TOOL V6.2 | |
| | 1 | 6ES7833-1SM62-0YA5 | SOFTWARE SIMATIC SAFETY MATRIX VIEWER V6.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CC03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE; 2X PROFINET-IO, SYSTEM EXPANSION CARD 500 INCL. F-RUNTIME LICENSE, AS RT PO 100, 1X CP443-1 IE/PN, UR2 ALU RACK, 1X UC 120/230V 10A POWER SUPPLY | [2] |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

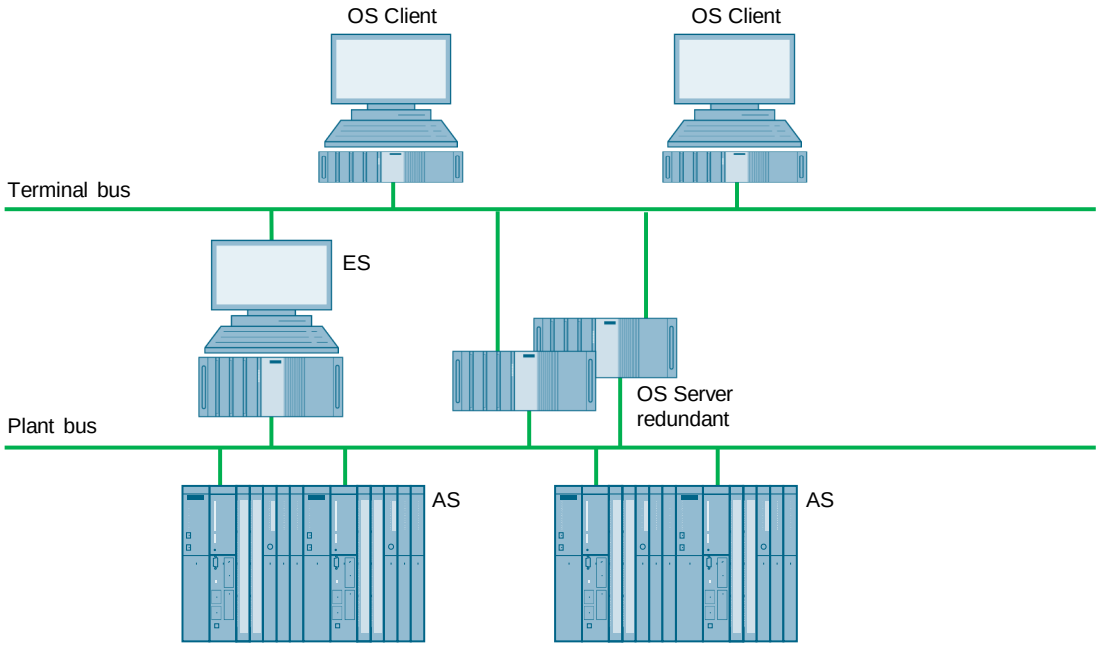
**Note**

[1] The number of POs can be increased later by means of extra volume licenses.

[2] Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

## 17.2 OS Client/OS Server with redundant Process safety

In this configuration, the system has one redundant OS server pair and two OS clients. The ES is configured on a separate PC. The terminal bus and the plant bus are also set up on a redundant basis.




### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering Station** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6ES7833-1CC02-0YA5 | SOFTWARE SIMATIC S7, F-PROG-SW ENG | |
| | 1 | 6ES7833-1SM02-0YA5 | SOFTWARE SIMATIC SAFETY MATRIX TOOL V6.2 | |
| | 1 | 6ES7833-1SM62-0YA5 | SOFTWARE SIMATIC SAFETY MATRIX VIEWER V6.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6) 7) 8) |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) 5) |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6) 7) 8) |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 6) 7) 8) |
| | 2 | 6ES7833-1SM62-0YA5 | SOFTWARE SIMATIC SAFETY MATRIX VIEWER V6.2 | |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CE30-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO INCL. F-RUNTIME LICENSE, AS RT PO 100, 2 X 2 10M SYNC-MODULE AND | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Needed if a redundant system bus is chosen.

2) The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is chosen.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

6) The onboard interfaces can be used.

7) Single license for one installation.

8) Necessary if a redundant terminal bus is selected.

# 18 24 V DC supply concepts

### High availability

A reliable power supply is a basic condition for plant operation. With MTBF ratings of up to 1 million hours at full load in continuous operation, SITOP power supplies meet the particularly stringent requirements of processing industries. To further increase availability, the system supports redundant establishment of the power supply as well as buffer operation in the case of a power failure.

### Universal application

To allow use all over the world, one- or three-phase SITOP power supplies have a wide temperature range of -25 …+70 °C. In addition, they have a wide range of different international approvals (e.g. ATEX, Class I Div2, IECex, GL, ABS, etc.), which means that you can use them all over the world.

### Scalability

SITOP power supplies have different output power levels of up to 1000W, which allows you to tailor them to match your system configuration and layout. Depending on your requirements, you can combine them with redundancy, selectivity or DC UPS modules. This means that you can expand the system on an individual basis up to complete all-round protection.

**Notes**

In the next few sub-sections, we will describe preferred 24 V DC supply concepts. Depending on your requirements (e.g. buffered power supply with selective monitoring), you can combine them with different components.

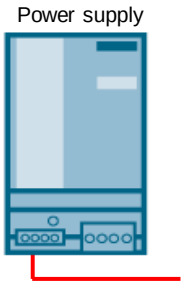
The SITOP library is available for preferred power supply concepts with blocks and faceplates for direct integration into SIMATIC PCS 7. This means that PCS 7 users automatically receive information about operating status conditions (e.g. buffer mode), maintenance requirements (e.g. replacing batteries) and disturbances (e.g. short-circuit or overload in 24V circuits).

SITOP library for SIMATIC PCS 7:
https://support.industry.siemens.com/cs/ww/en/view/109476154

## 18.1 Basic power supplies

Single- and three-phase SITOP modular units are the technology power supplies for demanding solutions. The wide-range input makes it possible to connect to almost any electrical power system worldwide and ensures a high degree of safety even when large voltage fluctuations occur. They offer outstanding overload characteristics: Power boost delivers up to three-times the rated current for short periods of time, and with extra power of 150%, loads with high power consumption can be connected without any problems. The very high degree of effectivity keeps energy consumption and heat dissipation in the control cabinet very low and the compact metal housing also saves space.

Single-phase power supplies of S7-300 design can be mounted directly onto S7 rails. They automatically carry out range switchover to single-phase 120/230 V AC networks.



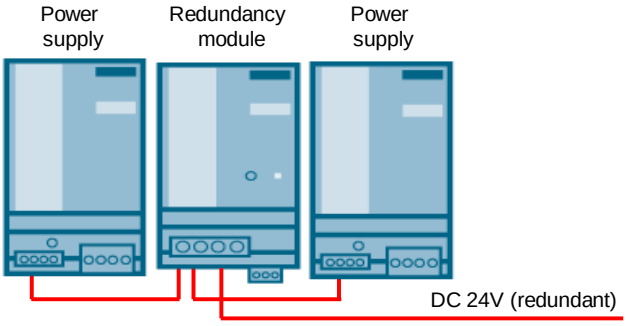



### Parts list

| Article number | Product description |
|---|---|
| **INPUT: 120/230 V AC OUTPUT: 24 V / 5 A DC** | |
| 6ES7307-1EA01-0AA0 | SIMATIC S7-300 PS307 STABILIZED POWER SUPPLY |
| 6EP3333-8SB00-0AY0 | SITOP PSU8200 24V/5A STABILIZED POWER SUPPLY |
| **INPUT: 120/230 V AC OUTPUT: 24V/10A DC** | |
| 6ES7307-1KA02-0AA0 | SIMATIC S7-300 PS307 STABILIZED POWER SUPPLY |
| 6EP3334-8SB00-0AY0 | SITOP PSU8200 24V/10A STABILIZED POWER SUPPLY |
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/20A DC** | |
| 6EP1336-3BA10 | SITOP PSU8200 20A STABILIZED POWER SUPPLY |
| **INPUT: AC 120-230V AC, OUTPUT: 24V/40A DC** | |
| 6EP3337-8SB00-0AY0 | SITOP PSU8200 40A STABILIZED POWER SUPPLY |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/20A DC** | |
| 6EP3436-8SB00-0AY0 | SITOP PSU8200 24V/20A STABILIZED POWER SUPPLY |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/40A DC** | |
| 6EP1437-3BA10 | SITOP PSU8200 24V/40A STABILIZED POWER SUPPLY |

## 18.2 Redundant power supply

SITOP redundancy modules provide additional protection from failure of the 24 V supply. Decoupling the two power supply units of the same type by means of a redundancy module means that a failure of one power supply unit has no effect on the 24 V power supply. The redundancy module continuously monitors the power supply units and, if one unit fails, the other one automatically takes over the supplying of power. In addition, signaling is carried out by means of a signal contact that is evaluated in SIMATIC PCS 7.





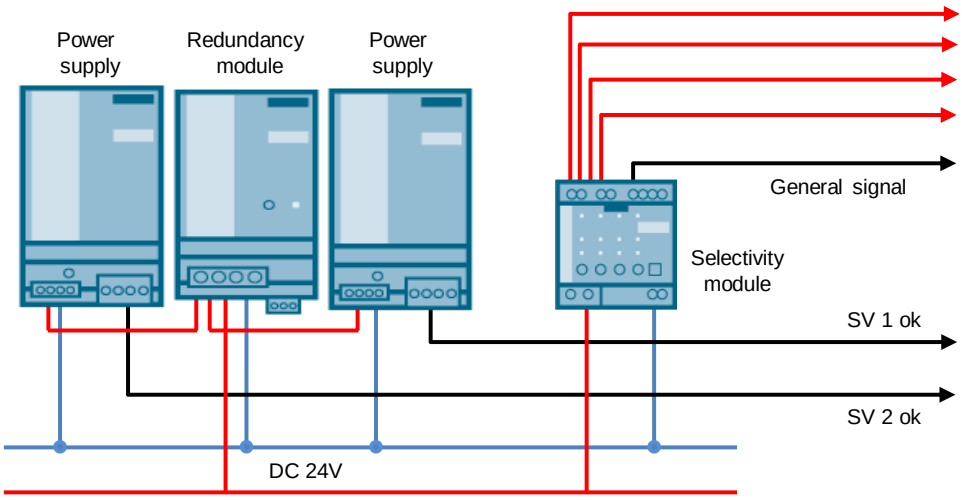

### Parts list

| Article number | Product description | Quantity |
|---|---|---|
| **INPUT: 120/230 V AC OUTPUT: 24V/10A DC** | | |
| 6EP3334-8SB00-0AY0 | SITOP PSU8200 24V/10A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE INPUT/OUTPUT: 24V/40A DC | 1 |
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/20A DC** | | |
| 6EP1336-3BA10 | SITOP PSU8200 24V/20A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE INPUT/OUTPUT: 24V/40A DC | 1 |
| **INPUT: AC 120-230V AC, OUTPUT: 24V/40A DC** | | |
| 6EP3337-8SB00-0AY0 | SITOP PSU8200 24V/40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE INPUT/OUTPUT: 24V/40A DC | 2 |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/20A DC** | | |
| 6EP3436-8SB00-0AY0 | SITOP PSU8200 24V/20A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE INPUT/OUTPUT: 24V/40A DC | 1 |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/40A DC** | | |
| 6EP1437-3BA10 | SITOP PSU8200 24V/40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE INPUT/OUTPUT: 24V/40A DC | 2 |

## 18.3 Redundant power supply with selective monitoring of the 24 V feeders

SITOP select selectivity modules are an optimum enhancement for all 24V power supplies to distribute the load current to several feeders and to monitor it. Overloads and short-circuits in one or more feeders are detected reliably.

This is ensured even on high-resistance lines and in the case of "creeping" short-circuits. The intact feeders continue to supply the SITOP selectivity modules with 24 V on an absolutely interruption- and reaction-free basis. Their signal contact can be looped across several selectivity modules and can be evaluated as a common alarm in SIMATIC PCS 7.




| Article number | Product description | Quantity |
|---|---|---|
| **INPUT: 120/230 V AC OUTPUT: 24V/10A DC** | | |
| 6EP3334-8SB00-0AY0 | SITOP PSU8200 24V/10A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP1961-2BA11 | SITOP PSE200U 3 A SELECTIVITY MODULE 4-CHANNEL<br>OUTPUT CURRENT CAN BE SET TO 0.5-3 PER CHANNEL | 1* |
| **INPUT: 120-230V AC 110-220 V DC OUTPUT: 24V/20A DC** | | |
| 6EP1336-3BA10 | SITOP PSU8200 20A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP1961-2BA21 | SITOP PSE200U 10 A SELECTIVITY MODULE 4-CHANNEL<br>OUTPUT CURRENT CAN BE SET TO 3-10 PER CHANNEL | 1* |

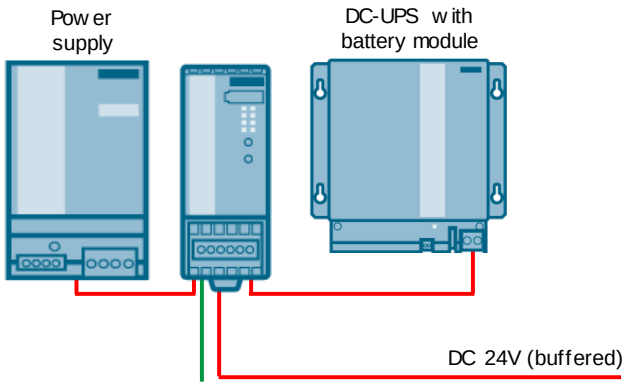
| Article number | Product description | Quantity |
|---|---|---|
| **INPUT: AC 120-230V AC, OUTPUT: 24V/40A DC** | | |
| 6EP3337-8SB00-0AY0 | SITOP PSU8200 40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 2 |
| 6EP1961-2BA21 | SITOP PSE200U 10 A SELECTIVITY MODULE 4-CHANNEL<br>OUTPUT CURRENT CAN BE SET TO 3-10 PER CHANNEL | 1* |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/20A DC** | | |
| 6EP3436-8SB00-0AY0 | SITOP PSU8200 24 V/20 A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP1961-2BA21 | SITOP PSE200U 10 A SELECTIVITY MODULE 4-CHANNEL<br>OUTPUT CURRENT CAN BE SET TO 3-10 PER CHANNEL | 1* |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/40A DC** | | |
| 6EP1437-3BA10 | SITOP PSU8200 24V 40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>OUTPUT CURRENT CAN BE SET TO 3-10 PER CHANNEL | 2 |
| 6EP1961-2BA21 | SITOP PSE200U 10 A SELECTIVITY MODULE 4-CHANNEL<br>OUTPUT CURRENT CAN BE SET TO 3-10 PER CHANNEL | 1* |

* Depending on the requirements, the output current of the power supply unit can be distributed to several PSE200Us (signal contact can be looped across several PSE200Us).

**Note** The redundant power supply with selective monitoring of the 24 V feeders is particularly suitable for supplying power to the 24 V consumers at the field level.

## 18.4 Buffered power supply

A power failure not only interrupts the AC power supply but also the 24V supply and the automation system that is connected to it. Costly downtime and undefined system states can be the result. The SITOP UPS1600 DC UPS with battery modules prevents this scenario by providing reliable backup of the 24 volt supply for up to several hours. Depending on the version of the DC DC UPS, it is integrated into the control system by means of digital I/Os or via PROFINET.




| Article number | Product description | Quantity |
|---|---|---|
| **INPUT: 120/230 V AC OUTPUT: 24V/10A DC** | | |
| 6EP3334-8SB00-0AY0 | SITOP PSU8200 24V/10A STABILIZED POWER SUPPLY | 1 |
| 6EP4134-3AB00-2AY0 | SITOP UPS1600 10A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET INTERFACE | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/20A DC** | | |
| 6EP1336-3BA10 | SITOP PSU8200 20A STABILIZED POWER SUPPLY | 1 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/40A DC** | | |
| 6EP3337-8SB00-0AY0 | SITOP PSU8200 40A STABILIZED POWER SUPPLY | 1 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |

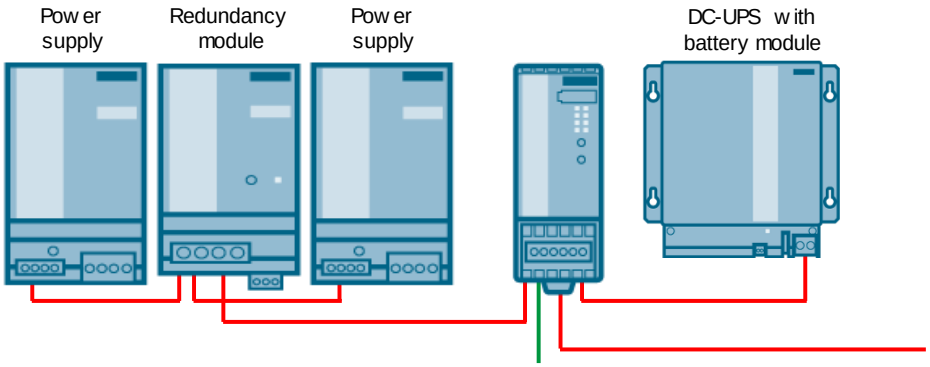
| **INPUT: 3 AC 400-500V OUTPUT: 24V/20A DC** | | |
|---|---|---|
| 6EP3436-8SB00-0AY0 | SITOP PSU8200 24 V/20 A STABILIZED POWER SUPPLY | 1 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/40A DC** | | |
| 6EP1437-3BA10 | SITOP PSU8200 24V 40A STABILIZED POWER SUPPLY | 1 |
| 6EP4137-3AB000-2AY0 | SITOP UPS1600 40A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |

* The backup time is governed by the load current and the number of battery modules, see the table below. When choosing the correct DC UPS configuration combined with other battery modules (lead, pure lead, LiFePo, and capacitances) the SITOP Selection Tool helps you in an optimum way: www.siemens.com/sitop-selection-tool

| **Load current** | **Battery module 12 Ah (6EP4135-0GB00-0AY0)** |
|---|---|
| 4O | 2.3 h |
| 6A | 1.4 h |
| 10 A | 48.6 min |
| 20A | 19.6 min |
| 40A | 8.5 min (2 x 12 Ah) |

## 18.5 Redundant power supply with buffering

If you have more demanding requirements of a reliable 24V supply, it is possible to combine a redundant power supply with a DC UPS. This ensures that 24V power continues to be supplied even if a power supply fails or there is a power outage.




### Parts list

| Article number | Product description | Quantity |
|---|---|---|
| **INPUT: 120/230 V AC OUTPUT: 24V/10A DC** | | |
| 6EP3334-8SB00-0AY0 | SITOP PSU8200 24V/10A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP4134-3AB00-2AY0 | SITOP UPS1600 10A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET INTERFACE | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/20A DC** | | |
| 6EP1336-3BA10 | SITOP PSU8200 20A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |

| | | |
|---|---|---|
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/40A DC** | | |
| 6EP3337-8SB00-0AY0 | SITOP PSU8200 40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 2 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/20A DC** | | |
| 6EP3436-8SB00-0AY0 | SITOP PSU8200 24 V/20 A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/40A DC** | | |
| 6EP1437-3BA10 | SITOP PSU8200 24V 40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 2 |
| 6EP4137-3AB000-2AY0 | SITOP UPS1600 40A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 1 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 1-6* |

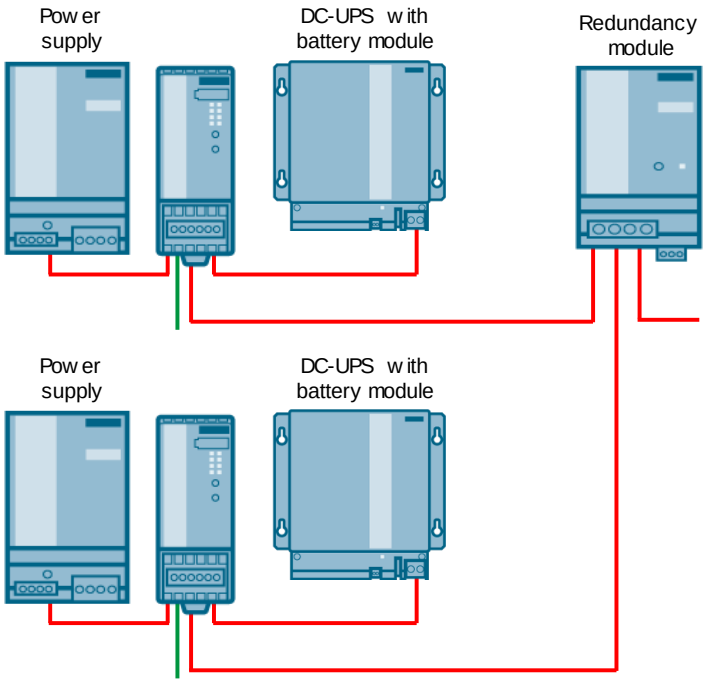


* The backup time is governed by the load current and the number of battery modules, see the table below. When choosing the correct DC UPS configuration combined with other battery modules (lead, pure lead, LiFePo, and capacitances) the SITOP Selection Tool helps you in an optimum way:www.siemens.com/sitop-selection-tool

| **Load current** | **Battery module 12 Ah (6EP4135-0GB00-0AY0)** |
|---|---|
| 4O | 2.3 h |
| 6A | 1.4 h |
| 10 A | 48.6 min |
| 20A | 19.6 min |
| 40A | 8.5 min (2 x 12 Ah) |

## 18.6 Redundant power supply with redundant buffering

If the requirements of the 24 V power supply are particularly demanding, it is possible to set up the power supplies with DC UPS on a redundant basis. This ensures that 24V power continues to be supplied even if there is a power outage, or a power supply or DC UPS component fails.




| Article number | Product description | Quantity |
|---|---|---|
| **INPUT: 120/230 V AC OUTPUT: 24V/10A DC** | | |
| 6EP3334-8SB00-0AY0 | SITOP PSU8200 24V/10A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP4134-3AB00-2AY0 | SITOP UPS1600 10A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET INTERFACE | 2 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 2x<br>1-6* |

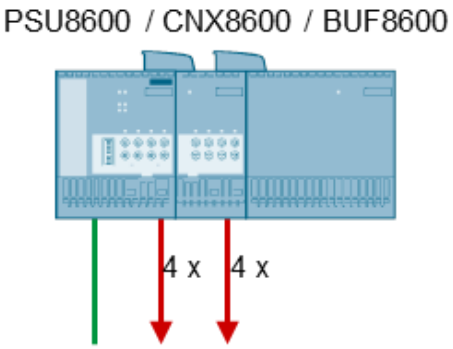
| | | |
|---|---|---|
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/20A DC** | | |
| 6EP1336-3BA10 | SITOP PSU8200 20A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 2 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 2x<br>1-6* |
| **INPUT: 120-230V AC 110-220V DC OUTPUT: 24V/40A DC** | | |
| 6EP3337-8SB00-0AY0 | SITOP PSU8200 40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 2 |
| 6EP4137-3AB00-2AY0 | SITOP UPS1600 40A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 2 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 2x<br>1-6* |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/20A DC** | | |
| 6EP3436-8SB00-0AY0 | SITOP PSU8200 24 V/20 A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 1 |
| 6EP4136-3AB00-2AY0 | SITOP UPS1600 20A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 2 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 2x<br>1-6* |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/40A DC** | | |
| 6EP1437-3BA10 | SITOP PSU8200 24V 40A STABILIZED POWER SUPPLY | 2 |
| 6EP1961-3BA21 | SITOP PSE202U REDUNDANCY MODULE<br>INPUT/OUTPUT: 24V/40A DC | 2 |
| 6EP4137-3AB000-2AY0 | SITOP UPS1600 40A UNINTERRUPTIBLE POWER SUPPLY WITH ETHERNET/PROFINET | 2 |
| 6EP4135-0GB00-0AY0 | SITOP UPS1100 BATTERY MODULE WITH MAINTENANCE-FREE SEALED LEAD-ACID BATTERY FOR 24 V DC 12 AH SITOP DC UPS MODULES | 2x<br>1-6* |

* The backup time is governed by the load current and the number of battery modules, see the table below. When choosing the correct DC UPS configuration combined with other battery modules (lead, pure lead, LiFePo, and capacitances) the SITOP Selection Tool helps you in an optimum way: www.siemens.com/sitop-selection-tool

| Load current | Battery module 12 Ah (6EP4135-0GB00-0AY0) |
|---|---|
| 4O | 2.3 h |
| 6A | 1.4 h |
| 10 A | 48.6 min |
| 20A | 19.6 min |
| 40A | 8.5 min (2 x 12 Ah) |

## 18.7 Power supply system with selective monitoring and buffering

The SITOP PSU8600 power supply system consists of a PSU8600 basic unit, up to four CNX8600, and a maximum of two BUF8600 buffer modules. Depending on the expansion of the system, you can selectively monitor up to 20 DC outputs and bypass power outages of up to seconds. The modular system makes possible individual combination of the power supply system without any additional wiring. The order of the expansion modules and buffer modules is irrelevant in this case. They are integrated into the control system via PROFINET. Comprehensive operating and diagnostic information is available such as the voltage and current values of the individual outputs.




| | | |
|---|---|---|
| **INPUT: 3 AC 400-500V OUTPUT: 24V/20A DC** | | |
| 6EP3436-8MB00-2CY0 | SITOP PSU8600 20A/4X 5 A STABILIZED POWER SUPPLY WITH PN/IE CONNECTION | 1 |
| 6EP4436-8XB00-0CY0 | SITOP CNX8600 4X 5 A EXPANSION MODULE FOR PSU8600 | 1* |
| 6EP4293-8HB00-0XY0 | SITOP BUF8600 BUFFER MODULE FOR PSU8600 BUFFER CAPACITY 4 S/40A | 1 |
| **INPUT: 3 AC 400-500V OUTPUT: 24V/40A DC** | | |
| 6EP3437-8MB00-2CY0 | SITOP PSU8600 40A/4X 10A STABILIZED POWER SUPPLY WITH PN/IE CONNECTION | 1 |
| 6EP4436-8XB00-0CY0 | SITOP CNX8600 4X 10 A EXPANSION MODULE FOR PSU8600 | 1* |
| 6EP4295-8HB00-0XY0 | SITOP BUF8600 BUFFER MODULE FOR PSU8600 BUFFER CAPACITY 10 S/40A | 1 |

* Depending on the requirements, the output current of the power supply unit can be distributed to a maximum of four other CNX8600s.

# 19 Possibilities for data exchange

### Client/server system and OpenPCS 7

SIMATIC PCS 7 offers access to all real-time values, archive values, and messages at any time. The OpenPCS 7 software is the extensive interface for this access. It establishes the connection to the SIMATIC PCS 7 OS servers as well as to the Central Archive servers and offers access to all the data via standard OPC server technology. It combines OPC UA DA (Unified Architecture), OPC DA (Data Access), OPC HDA (Historical Data Access), OPC AE (Alarms & Events) and OPC HAE (Historical Alarms & Events) in one system.

In addition to this, it is also possible to achieve simple, standardized direct access to the archive data in the Microsoft SQL server database of the Operator System via OLE-DB.

### Small system

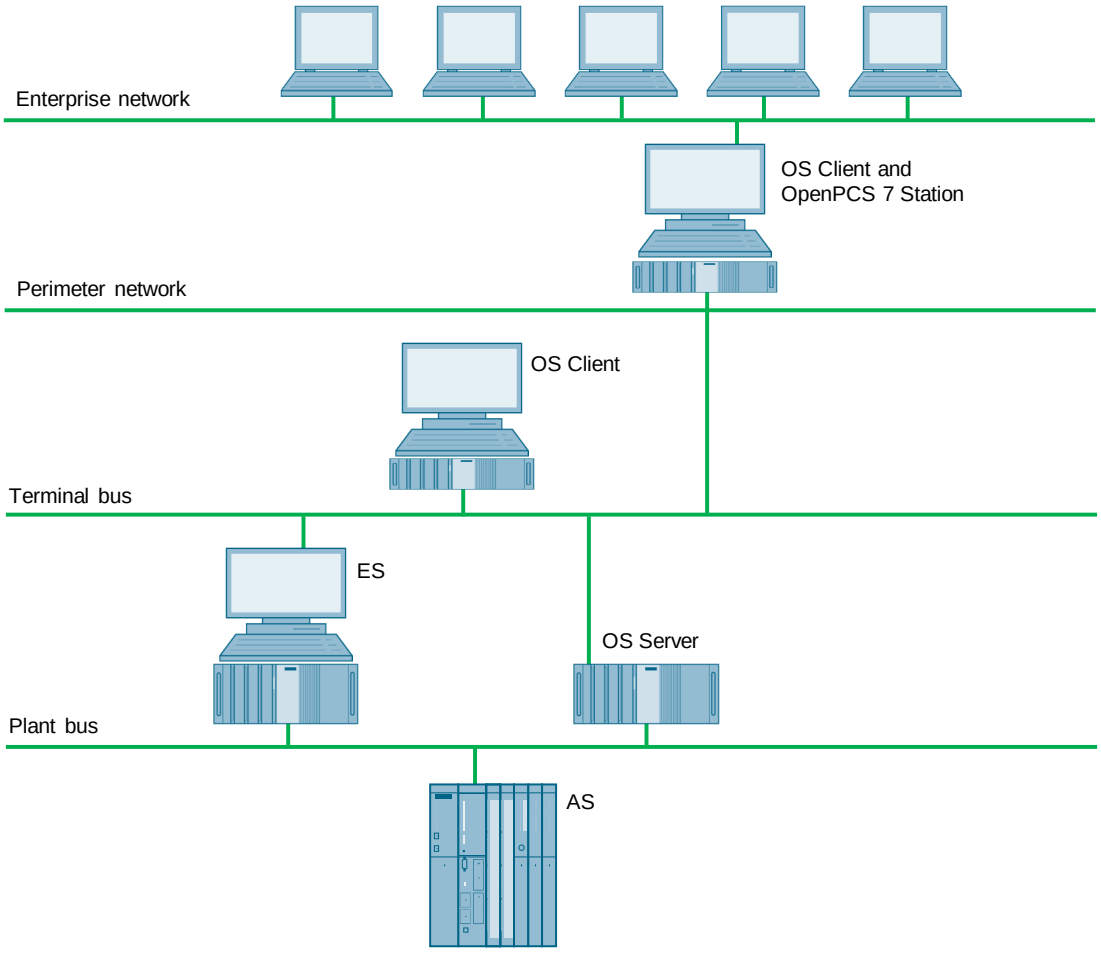
Smaller systems benefit from a cost-effective combination of functionality from OpenPCS 7 and OS clients.

### Large system

For large high-performance applications, OpenPCS 7 runs on a standalone PC and provides access to all the data that is located on multiple redundant SIMATIC PCS 7 systems composed of an OS server and a Process Historian.

## 19.1 Small client/server system and OpenPCS 7

In this configuration, the system has one OS server and one OS client. The OpenPCS 7 Station is configured on an OS Client.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering system** | | | | |
| 1 | | 6ES7660-6DA10-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, 500 GB HD SATA, 8GB DDR3, BCE, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **OS server** | | | | |
| 1 | | 6ES7660-6EC10-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, BCE, PCS 7 V8.2 , WIN SERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7658-2BA28-0YA0 | SOFTWARE SIMATIC PCS 7 OS-SERVER V8.2 (PO 100) | 1) |
| **OS client** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **OS client and OpenPCS 7 station** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 3) |
| 1 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 1 | | 6ES7658-0GX28-2YB0 | SOFTWARE SIMATIC PCS 7 OPENPCS 7/OS-CLIENT V8.2 | |
| | 1 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 1 | | 6ES7654-6CN03-3BF0 | SIMATIC PCS 7 SINGLE AS, CPU 410-5H, 1X DP-MODULE, 2x PROFINET-IO, SYSTEM EXPANSION CARD 1000 PO, AS RT PO 100, CP443-1IE, UR2 ALU RACK, 1 X UC 120/230V 10A POWER SUPPLY | 2) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) The number of POs can be increased later by means of extra volume licenses.

2) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

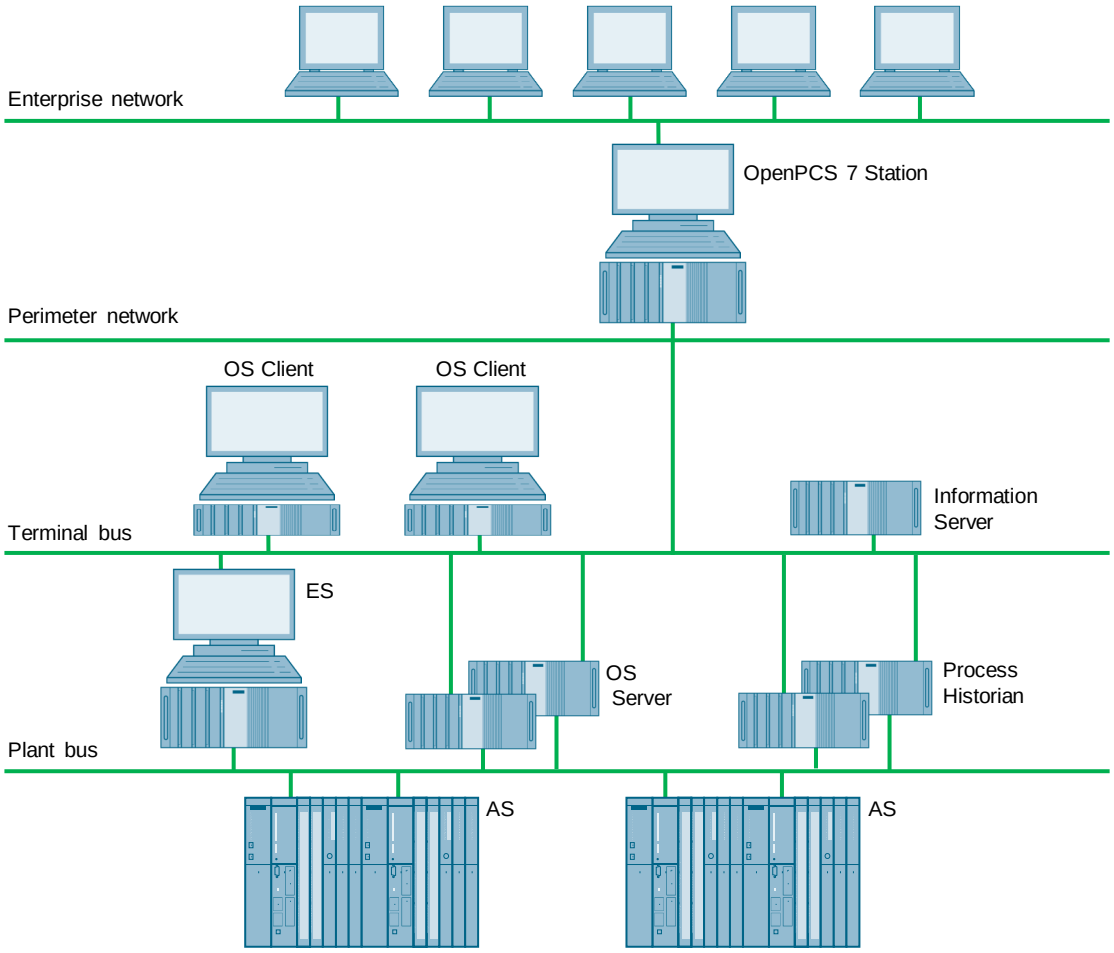
3) Necessary for the Enterprise network connection when using a redundant terminal bus.

Firewall applications between the terminal bus and the perimeter network, and between the perimeter network and the enterprise network are not listed but are necessary.

Network components for the perimeter network and enterprise network connection have not been listed.

## 19.2 Large OS client/OS server system and OpenPCS 7

In this configuration, the system has one redundant OS server pair and two OS clients. The Process Historian is set up on a redundant basis with a separate Information Server. The OpenPCS 7 Station is configured on a separate OS Client. The terminal bus and the plant bus are set up on a redundant basis.



### Parts list

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Engineering system** | | | | |
| 1 | | 6ES7660-6DF11-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, ES/OS SINGLESTATION, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 8GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6ES7658-5AX28-0YA5 | SOFTWARE SIMATIC PCS 7 AS/OS ENGINEERING V8.2 | |
| 1 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 1 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |
| | 1 | 6ES7658-1CX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION CROSS MANAGER V8.2 | |
| | 1 | 6ES7658-1FX28-2YA5 | SOFTWARE SIMATIC PCS 7 VERSION TRIAL V8.2 | |
| | 1 | 6ES7658-1DX28-2YB5 | SOFTWARE SIMATIC PCS 7 IMPORT EXPORT ASSISTANT V8.2 | |
| **OS server** | | | | |
| 2 | | 6ES7660-6EF21-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, CORE I5, OS-SERVER, RAID1 (2 X 1 TB HDD SATA, DATA MIRRORING), 16GB DDR3, INDUSTRIAL ETHERNET (CP1623), PCS 7 V8.2, WINSERVER 2012 R2 STANDARD EDITION INCL. 5 CLIENT 64BIT | |
| 1 | | 6ES7652-3BA28-2YA0 | SOFTWARE SIMATIC PCS 7 OS SERVER REDUNDANCY V8.2 (PO 100) | 2) 7) |
| 2 | | 6GK1162-3AA00 | SIMATIC NET COMMUNICATION PROCESSOR CP 1623 PCI EXPRESS | 1) |
| 2 | | 6GK1716-0HB12-0AC0 | SIMATIC NET, S7-REDCONNECT POWERPACK | 3) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Process Historian** | | | | |
| 2 | | 6ES7660-6HN38-2EA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC847D, Xeon E3, OS-SERVER, RAID1 (2 x 1 TB HDD SATA) + 240GB SSD SATA, 32GB DDR3, PCS 7 V8.2, WIN SERVER 2012 R2 STANDARD 64BIT | |
| 2 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 6) |
| 1 | | 6XV1870-3RH60 | SIMATIC NET INDUSTRIAL ETHERNET TP XP CORD RJ45/RJ45, 6M | |
| 1 | | 6ES7652-7CX28-2YB0 | SOFTWARE SIMATIC PCS 7 PROCESS HISTORIAN SERVER REDUNDANCY V8.2 | 5) |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |
| **Information Server** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |
| 1 | | 6ES7652-7EX28-2YB0 | SOFTWARE SIMATIC PCS 7 INFORMATION SERVER BASIC PACKAGE V8.2 | 7) |
| 1 | | 6ES7652-7YA00-2YB0 | SOFTWARE SIMATIC PCS 7 INFORMATION SERVER CLIENT ACCESS 1 CLIENT | |
| **OS client** | | | | |
| 2 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 2 | | 6ES7658-2CX28-0YB5 | SOFTWARE SIMATIC PCS 7 OS CLIENT V8.2 | |
| 2 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |
| | 2 | 6ES7652-0XD28-2YB5 | SOFTWARE SIMATIC PCS 7 SFC VISUALIZATION V8.2 | |
| **OpenPCS 7 station** | | | | |
| 1 | | 6ES7660-5FA08-2AA0 | SIMATIC PCS 7 INDUSTRIAL WORKSTATION IPC647D, CORE I5, OS-CLIENT, 500 GB HD SATA, 4GB DDR3, PCS 7 V8.2, WIN 7 ULTIMATE 64BIT | |
| 1 | | A5E01579552 | DESKTOP ADAPTER NETWORK CARD | 6) |
| 1 | | 6ES7658-0HX28-2YB0 | SOFTWARE SIMATIC PCS 7 OPENPCS 7 V8.2 | |
| 1 | | 6GK1711-1EW12-0AA0 | SIMATIC NET SOFTNET-IE RNA V12 REDUNDANT NETWORK ACCESS | 8) |

| Required | Optional | Article number | Product description | Note |
|---|---|---|---|---|
| **Automation system** | | | | |
| 2 | | 6ES7656-6CP33-1CF0 | SIMATIC PCS 7 REDUNDANCY AS, 2X CPU 410-5H, 2 DP-MODULE, 2X PROFINET-IO, SYSTEM EXPANSION CARD 1600, AS RT PO 100, 2 X 2 10M SYNC-MODULES AND 2 X 1M FO, 2 X CP443-1 IE/PN, 1 X UR2-H ALU RACK, 2 X UC 120/230V 10A RED. POWER SUPPLY | 4) |
| | | 24 V DC power supply | Redundant power supply | Section 18.2 |

**Note**

1) Needed if a redundant system bus is chosen.

2) The number of POs can be increased later by means of extra volume licenses.

3) Necessary if a redundant system bus or a redundant automation system is chosen.

4) Please use the PCS 7 AS configurator, since different versions of the PCS 7 AS 410-5H are available; e.g., 24V DC or 110/230V AC.

5) The tag inventory can be expanded using cumulative volume licenses (SIMATIC PCS 7 OS/PH Archive up to a maximum of 120,000 archive tags).

6) Necessary for the Enterprise network connection when using a redundant terminal bus.

7) The redundant OS server pair is supplied with an RS-232 serial connection cable. If there is a long distance between the redundant systems, you can use an Ethernet connection instead. This requires additional Ethernet network interface cards in the systems.

8) The onboard interfaces can be used.
Single License for one installation.
Necessary if a redundant terminal bus is selected.

Firewall applications between the terminal bus and the perimeter network, and between the perimeter network and the enterprise network are not listed but are necessary.

Network components for the perimeter network and enterprise network connection have not been listed.

# 20 AS-OS PO counting

## 20.1 Process objects

The following applies to the licensing of process objects (POs) in SIMATIC PCS 7 V 8.2:

The following are counted as process objects by PCS 7:

- all SFCs
- all block instances that meet the following criteria:
  - they can be operated and monitored
  - they generate messages
  - they are not channel blocks

These objects are transferred to the OS and require a license.

Blocks that can be operated and monitored have the attribute "S7_m_c = true" in their block properties.

Process objects can include the following blocks and objects:

- Blocks for operator control and monitoring of a plant
- Objects for automation
- Objects for signal capture and processing

As a general rule, 0.75...1.5 I/Os correspond to one process object.

For PCS 7 licensing, the total number of process objects is counted regardless of the number of inputs and outputs. The data that is exchanged with other automation systems also has no effect on the number of process objects.

**Note** The described PO count may vary for individual blocks. For example, the Model Predictive Controller (MPC) controller block is counted with 100 POs.

**Note** Under the following link, you can find an FAQ on how to count POs:
https://support.industry.siemens.com/cs/ww/en/view/38855207

You can find more information about licenses and quantity structures in the "Process Control System PCS 7 Licenses and configuration limits (V8.2)" manual:

## 20.2 Cumulative licenses

The cumulative licenses below are available for individual SIMATIC software products:

| Article number | Product description |
|---|---|
| **AS Runtime license** | |
| 6ES7653-2BA00-0XB5 | SOFTWARE SIMATIC PCS 7 RUNTIME LICENSE AS (PO 100) |
| 6ES7653-2BB00-0XB5 | SOFTWARE SIMATIC PCS 7 RUNTIME LICENSE AS (PO 1000) |
| 6ES7653-2BC00-0XB5 | SOFTWARE SIMATIC PCS 7 RUNTIME LICENSE AS (PO 10,000) |
| **OS Runtime license** | |
| 6ES7658-2XA00-0XB0 | SOFTWARE SIMATIC PCS 7 OS RUNTIME LICENSE (PO 100) |
| 6ES7658-2XB00-0XB0 | SOFTWARE SIMATIC PCS 7 OS RUNTIME LICENSE (PO 1000) |
| 6ES7658-2XC00-0XB0 | SOFTWARE SIMATIC PCS 7 OS RUNTIME LICENSE (PO 5000) |
| **OS archive** | |
| 6ES7658-2EA00-2YB0 | SIMATIC PCS 7, SOFTWARE OS ARCHIVES (1500 TAGS) |
| 6ES7658-2EB00-2YB0 | SIMATIC PCS 7, SOFTWARE OS ARCHIVES (5000 TAGS) |
| 6ES7658-2EC00-2YB0 | SIMATIC PCS 7, SOFTWARE OS ARCHIVES (10,000 TAGS) |
| 6ES7658-2ED00-2YB0 | SIMATIC PCS 7, SOFTWARE OS ARCHIVES (30,000 TAGS) |
| **PDM** | |
| 6ES7658-3XC00-2YB5 | SIMATIC PDM, SOFTWARE (10 TAGS) |
| 6ES7658-3XD00-2YB5 | SIMATIC PDM, SOFTWARE (100 TAGS) |
| 6ES7658-3XE00-2YB5 | SIMATIC PDM, SOFTWARE (1000 TAGS) |
| **BATCH** | |
| 6ES7657-0XA00-0YB0 | SIMATIC PCS 7, SOFTWARE SIMATIC BATCH (1 UNIT) |
| 6ES7657-0XB00-0YB0 | SIMATIC PCS 7, SOFTWARE SIMATIC BATCH (10 UNITS) |
| 6ES7657-0XC00-0YB0 | SIMATIC PCS 7, SOFTWARE SIMATIC BATCH (50 UNITS) |
| **Route Control Routes** | |
| 6ES7658-7FF00-0XB0 | SIMATIC PCS 7, SOFTWARE SIMATIC ROUTE CONTROL (10 ROUTES) |
| 6ES7658-7FG00-0XB0 | SIMATIC PCS 7, SOFTWARE SIMATIC ROUTE CONTROL (50 ROUTES) |
| **Maintenance RT** | |
| 6ES7658-7GB00-2YB0 | SIMATIC PCS7, SOFTWARE MAINTENANCE STATION RUNTIME (100 TAGS) |
| 6ES7658-7GC00-2YB0 | SIMATIC PCS7, SOFTWARE MAINTENANCE STATION RUNTIME (1000 TAGS) |
| **SIMATIC Management Console** | |
| 6ES7658-5BA00-2YB5 | SIMATIC PCS 7, SOFTWARE MANAGEMENT CONSOLE (10 AGENTS) |
| 6ES7658-5BB00-2YB5 | SIMATIC PCS 7, SOFTWARE MANAGEMENT CONSOLE (50 AGENTS) |
| 6ES7658-5BC00-2YB5 | SIMATIC PCS 7, SOFTWARE MANAGEMENT CONSOLE (100 AGENTS) |

| Article number | Product description |
|---|---|
| **Information Server – Client Access** | |
| 6ES7652-7YA00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER (1 CLIENT) |
| 6ES7652-7YB00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER (3 CLIENTS) |
| 6ES7652-7YC00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER (5 CLIENTS) |
| 6ES7652-7YD00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER (10 CLIENTS) |
| **Information Server – Datasource Access** | |
| 6ES7652-7YE00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER DATASOURCE ACCESS (1 SOURCE) |
| 6ES7652-7YF00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER DATASOURCE ACCESS (3 SOURCES) |
| **OS Web server** | |
| 6ES7658-2GE00-0XB0 | SIMATIC PCS 7, SOFTWARE WEB SERVER (1 CLIENT) |
| 6ES7658-2GF00-0XB0 | SIMATIC PCS 7, SOFTWARE WEB SERVER (5 CLIENTS) |
| 6ES7658-2GG00-0XB0 | SIMATIC PCS 7, SOFTWARE WEB SERVER (10 CLIENTS) |
| **Information Server – Datasource Access** | |
| 6ES7652-7YE00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER DATASOURCE ACCESS (1 SOURCE) |
| 6ES7652-7YF00-2YB0 | SIMATIC PCS 7, SOFTWARE INFORMATION SERVER DATASOURCE ACCESS (3 SOURCES) |

# 21 Service and Support

### Industry Online Support

Do you have questions or need assistance?

Using the Industry Online Support, you have round-the-clock access to expertise spanning the entire range of service and support, as well as to our services.

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

Product information, manuals, downloads, FAQs and application examples – all information can be accessed with just a few mouse clicks:
https://support.industry.siemens.com/

### Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:
https://support.industry.siemens.com/cs/ww/en/sc/2067

### Technical Support

The Siemens Industry Technical Support offers you fast and competent support for any technical queries you may have with a number of tailor-made solutions – ranging from basic support to individual support contracts.

You send queries to Technical Support via Web form:
www.siemens.com/industry/supportrequest

### Range of services

Our range of services include the following:

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

You can find detailed information on our range of services in the service catalog:
https://support.industry.siemens.com/cs/sc

### Contact partners

If you want to request on-site service or need spare parts, please get in touch with your local Siemens representative, who will put you in contact with the responsible service center. You can find your contact partner in the contact database:
www.siemens.com/yourcontact

# 22 Appendix

## 22.1 References

| | Topic |
|---|---|
| \1\ | Siemens Industry Online Support<br>https://support.industry.siemens.com |
| \2\ | Download page of this entry<br>https://support.industry.siemens.com/cs/ww/en/view/109739629 |
| \3\ | SIMATIC PCS 7 Standard Architectures (V7.0/V7.1/V8.0/V8.1)<br>https://support.industry.siemens.com/cs/ww/en/view/32201963 |
| \4\ | SIMATIC PCS 7 technical documentation – Manuals collection<br>http://w3.siemens.com/mcms/industrial-automation-systems-simatic/en/manual-overview/tech-doc-pcs7/Pages/Default.aspx |
| \5\ | SIMATIC Process Control System PCS 7 PCS 7 - PC Configuration (V8.2)<br>https://support.industry.siemens.com/cs/ww/en/view/109485951 |
| \6\ | SIMATIC Process Control System PCS 7 Licenses and configuration limits V8.2<br>https://support.industry.siemens.com/cs/ww/en/view/109485967 |



## 22.2 History

| Version | Date | Change |
|---|---|---|
| V1.0 | 07/2016 | First edition V8.2 |
| V1.1 | 08/2016 | Text adjustments |
| | | |