SIEMENS

SIMATIC

PCS 7
Operator Station (V9.0)

Configuration Manual

Valid for PCS 7 as of V9.0

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Security information 1

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

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

Customer is responsible to prevent unauthorized access to its 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 necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit:

http://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

http://www.siemens.com/industrialsecurity.

Preface

2

Purpose of this documentation

This documentation contains complete information for configuring the PCS 7 operator station – the operator control and monitoring system of PCS 7 (for short: PCS 7 OS or OS). This documentation serves both as a guide for the individual configuration tasks and as a reference manual.

Options for accessing PCS 7 documentation

The documentation required for PCS 7 includes the following types:

- **PCS 7 Readme**
  The readme file is available in two versions:
  - **PCS 7 Readme (offline)**
    This version is installed by PCS 7 Setup. The file only contains general information and links to documents on the Internet.
  - **PCS 7 Readme (online)**
    This version contains complete information for installation and use of PCS 7 in the format which is already familiar to you. The file is only available on the Internet to keep it always up-to-date.

    Note

    The information provided in the *PCS 7 Readme* (online) on the Internet takes precedence over **all** other PCS 7 documentation.

    Please read this *PCS 7 Readme*, because it contains important and supplementary information for PCS 7.

- **PCS 7 system documentation**
  System documentation comprises cross-product documentation, such as configuration manuals and Getting Started manuals. This documentation serves as a guideline for the overall system and explains the interaction between the individual hardware and software components.
  Note the information on "PCS 7 Documentation Portal Setup" in the product overview *Process Control System PCS 7; PCS 7 - Documentation*; Section "Options for accessing the documentation".
- **PCS 7 product documentation**
  Product documentation contains information about special hardware and software components. The individual documents provide detailed information on the specific component.

Full versions of the documentation are available from the "Technical Documentation SIMATIC PCS 7" website:
www.siemens.com/pcs7-documentation (www.siemens.com/pcs7-documentation)

You can find additional information in the product overview *Process Control System PCS 7; PCS 7 - Documentation*; Section "Options for accessing the documentation".

Required basic knowledge

This documentation is a reference manual and, at the same time, a guide for those involved in the following:

- Configuring PCS 7
- Commissioning and servicing of PCS 7
- Specializing in OS configuration

This documentation is primarily intended for users of SIMATIC PCS 7 who have some initial experience with this system.

Conventions

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

If you use the operating system Windows 10, you can find the Siemens SIMATIC programs in the Start menu under **All apps > Siemens Automation**.

Changes compared to the previous version

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

As of PCS 7 V9.0

- Adaptation of Windows operating system

As of PCS 7 V8.2

- Plant-specific configuration of the key sets for process control

Guide

The configuration steps are described in a sequence that can be used for practical and fast configuration. The manual provides important background information and interrelationships for all of the configuration tasks in order to clarify their significance and context in the overall system. Some of the configuration tasks are mandatory, while others represent options that can be used to optimize your configuration. The summary tables at the outset of the manual indicate which configuration tasks you must always perform and which configuration tasks can be performed for additional optimization.

All work instructions utilize paths that can be accessed via the menu commands of the menu bar. For many of the functions, you also have the option of using commands in the shortcut menu for the individual objects.

Additional documentation

The documentation below provides additional information on certain topics that go beyond the scope of this manual:

- Online help *WinCC Information System* The support offered by this is only a few settings and configurations away. To open the *WinCC Information System*:
  - Click the "?" in the menu bar.
  - Click "Help" in the dialog box.
- *Process Control System PCS 7; OS Process Control* manual: The manual provides exhaustive information about operating and monitoring in process mode.
- Manual *Process Control System PCS 7; PCS 7 - PC Configuration*: Provides information about hardware / software requirements and about configuration options of a PCS 7 OS.
- Manual *Process Control System PCS 7; Engineering System*: Provides all detailed information you need to work with the Engineering System.

A cross-reference is provided to the relevant manual or online help wherever appropriate.

The PCS 7 Operator Station

3

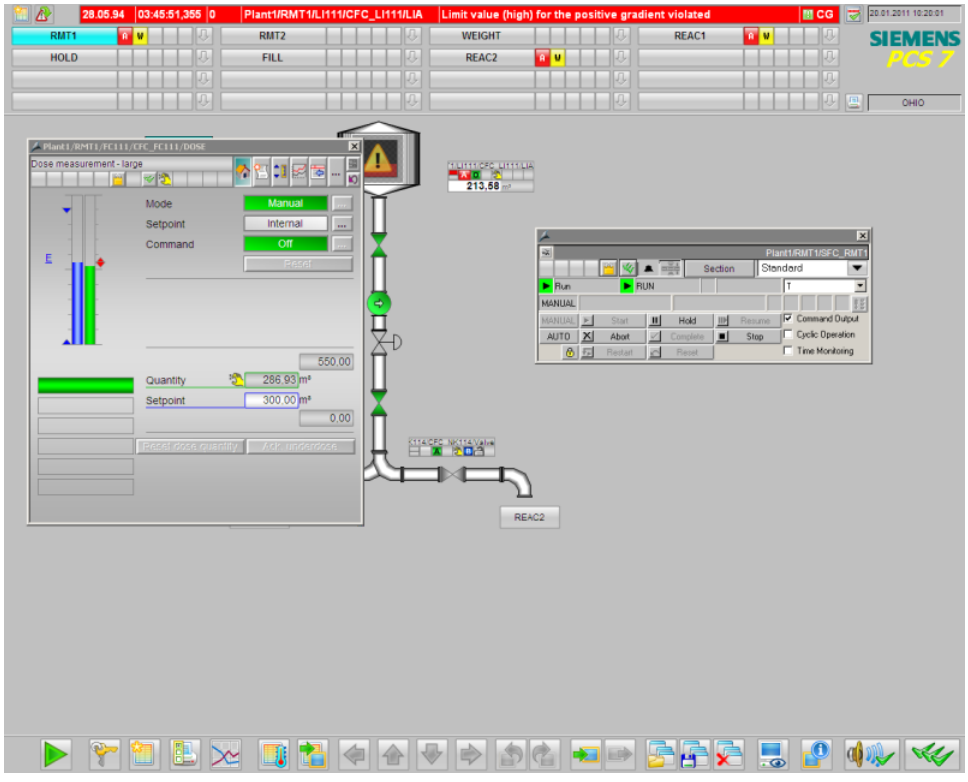
3.1 Overview of the PCS 7 Operator Station

Operator station in process mode

In PCS 7, the operator station is the central station for operator control and monitoring of a PCS 7 system.

Process pictures are used during process control for operator control and monitoring of the PCS 7 system. Faceplates provide you with information on the status of individual components and technological functions. You are also provided with the other information you need for operator control and monitoring, i.e. signal variation over time, message lists and alarm lists, as well as archive information.

The figure below illustrates the OS user interface in process mode.



Configuring the operator station

You must make the technological structure of a PCS 7 system known by configuring it in PCS 7. You configuring the OS in two steps on an engineering station (ES) as follows:

- Configuration of the hardware, plant hierarchy and communication connections
- Configuration of the views for process mode

This documentation contains **complete information for configuring the OS** for PCS 7.

Configuration and user interface languages

You can use various languages in process mode and during configuration. You can find additional information about this in the section "Configuration and user interface languages (Page 35)".

Additional information

- You can find **complete information on operating the OS in process mode** in the *Process Control System PCS 7; OS Process Control* manual.
- You can find information on licensing and configuration limits in the installation manual *Process Control System PCS 7;* Licenses and Configuration Limits.

3.2 Configurations for the PCS 7 Operator Station

Overview

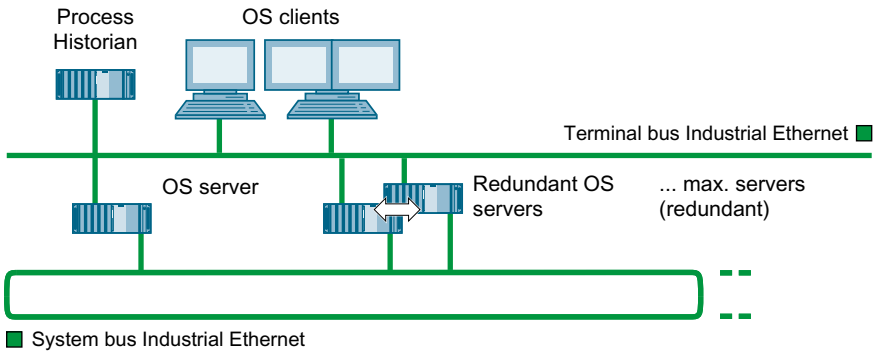
Operator stations are PCs on which the PCS 7 OS software is installed. The operator station is connected to the system bus to allow data communication with the automation system.

The architecture of the operator station is highly variable and can be flexibly adapted to a variety of plant sizes and customer requirements. The operator station can be configured as a single station or multiple station system with client-server architecture.

The OS server contains all the data of the operator control and monitoring system and the alarm and measured value archives. It establishes the communication connection to the automation systems.
The OS servers provide the process data to the OS clients. The OS clients are used to operate and monitor the process mode. They access the data of one or more OS servers.

We recommend setting up a terminal bus (separate from the system bus) for data communication between OS clients and the OS server in multiple station systems.

To increase availability, redundant OS servers can be set up.



Possible PC configurations for operator stations

The following PC configurations can be created for operator stations in a PCS 7 system:

- OS as single station system on a single PC:
  The complete operator control and monitoring capability for a PCS 7 project (system/subsystem) is located in one station. The OS single station system on the system bus can be used in parallel with additional single station or multiple station systems.
  Two OS single station systems can also be operated redundantly with the *WinCC/Redundancy* software package.
  The operator station can also be used in combination with an engineering station and an automation system on a single PC. This solution is offered as the SIMATIC PCS 7 BOX.
- OS as a multiple station system with client-server architecture:
  The OS multiple station system consists of OS clients (operator stations) that are supplied with data (project data, process values, archives, alarms and messages) by one or more OS servers via a terminal bus.
  OS clients can access data on several OS servers simultaneously (multi-client operation). OS servers also feature client functions so that they can access data (archives, messages, tags, variables) on other OS servers. This allows process pictures on one OS server to be interconnected with tags on other OS servers (server-to-server communication).
  You can find additional information on server-to-server communication in section "Creating and downloading server data (Page 295)".
  The *PCS 7 Server Redundancy* software package facilitates redundant operation of the OS servers.
- Plant configuration with multiple OS single station systems
  Configurations with multiple OS single station systems are possible in SIMATIC PCS 7. The maximum configuration includes the following OS single station systems:
  - 1 redundant OS single station system (single station system + single station system standby)
  - 6 non-redundant OS single station systems (as reference OS from the OS single station system)
  - Connection of PCS 7 Web client and/or PCS 7 Web diagnostics client to the reference OS
  - SIMATIC BATCH and Process Historian can be used

PC station for long-term archiving (Process Historian)

The Process Historian (external archive server) can be used for long-term archiving in the PCS 7.

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

The Process Historian can also be configured redundantly to increase availability.

You can find additional information about this in section "Archiving with PCS 7 (Page 243)".

Maintenance station (asset management)

An operator station can be configured and used as a maintenance station (MS). The maintenance station enables information on the status of all the PCS 7 components to be called up in hierarchically structured diagnostics screens.

You can find information about this in section "Using the PCS 7 Maintenance Station (Page 299)".

Web option for OS

The following configuration is used in PCS 7:

- In an OS multiple station system:
  PCS 7 Web server and PCS 7 Web client
- In an OS single station system:
  - PCS 7 Web server and PCS 7 Web client
  - PCS 7 Web Diagnostics server and PCS 7 Web Diagnostics client

You can find additional information on this in the section "Operator control and monitoring of process mode via the Internet or an intranet (Page 327)".

Redundant operator station

In a redundant configuration, you configure the OS redundantly.

Additional information

- Installation manual *Process Control System PCS 7; Licenses and Configuration Limits*
- Manual *Process Control System PCS 7; High Availability Process Control Systems*
- Manual *Process Control System PCS 7; Web Option for OS*
- Manual *SIMATIC; Process Historian*

3.3 OS Server and OS Client

OS server

An OS server is connected to the automation systems and receives the process data.

- An OS server can have operator control and monitoring functionality only if a maximum of four OS clients access this OS server.
- By using more than one OS server, you have the option of distributing data over multiple OS servers. For example, for a large plant, you can store a plant unit on each OS server.

The advantages of distributed systems are:

- Good scalability
- Isolation of plant units
- Higher availability as a result of good scalability and isolation of plant units

PCS 7 allows an OS server to access several other OS servers at the same time (server-server communication).

OS clients

OS clients are used in process mode for operator control and monitoring. OS clients access the data of the OS servers, visualize this data and allow operators to control the process. Data from several servers is shown in a process picture that is displayed on the OS client. The servers / server pairs in the project can be:

- OS server
- SIMATIC BATCH server
- SIMATIC Route Control server
- Process Historian (external archive server)

Multiple process monitors can be connected to a workstation (OS client) using a multi display setting. Sections of the plant that have been split up in this way can be managed using 1 keyboard and 1 mouse.

Additional information

- You can find information about the server-server communication in the section "Creating and downloading server data (Page 295)".
- You can find information about the configuration limits in the installation manual *Process Control System PCS 7; Licenses and Configuration Limits*.

Introduction to OS configuration 4

4.1 Overview of OS configuration

Configuring the OS

You configure the OS on the engineering station (ES). The OS configuration data are stored and managed centrally on the engineering station.

You configure the OS on the ES in SIMATIC Manager and WinCC Explorer:

- In SIMATIC Manager:
  - Configuring the plant hierarchy, hardware and communication connections (Page 27)
  - Creating process pictures in the plant hierarchy (Page 27)
- In WinCC Explorer:
  - Configuring process pictures and views for process mode (Page 29)

If you want to use several operator stations with the same configuration, we recommend you configure reference operator stations.

Plant hierarchy as the basis

You define the plant hierarchy of your PCS 7 system in SIMATIC Manager. Important functions of the OS are based on this plant hierarchy:

- The plant hierarchy is mapped in the overview area in process mode.
  From the overview area the plant operator can select OS areas so that they are displayed in the work area.
- During the configuration process, you insert process pictures in the plant hierarchy matching the structure of your PCS 7 system. This very hierarchy serves as the basis for configuring the OS. The picture and directory names that you assign in the plant hierarchy are automatically transferred to the OS. This makes it easier to manage your process pictures.

The plants and units from the plant hierarchy correspond to the OS areas of the operator station.

Process pictures

Many features are available to help you create process pictures:

- PCS 7 offers pre-configured block icons for various operator controllable and monitorable blocks that you use, for example, in CFCs. Block icons are graphic representations of blocks and are automatically inserted by PCS 7 in the process pictures.
- PCS 7 provides faceplates that the plant operator can conveniently use for operator control and monitoring of process tags.

- When you insert objects in process pictures, you can interconnect them easily and directly with I/Os of blocks that you, for example, have already used in CFCs.
- The PCS 7 Wizards support you in the dynamization of objects in process pictures.

Adherence to configuration limits

Note

When configuring the OS, be sure to adhere to the permitted configuration limits for PCS 7.

- You can find information about permitted configuration limits in the documentation *Process Control System PCS 7; Engineering System*.
- You can find information about determining the process objects during configuration in the installation manual *Process Control System PCS 7;* Licenses and Configuration Limits.

4.2 Overview of configuration steps in SIMATIC Manager

Introduction

In the following you will find an overview of the individual configuration steps you perform in SIMATIC Manager. The steps are listed in the overview tables in the recommended order. You can find detailed information about each individual configuration step in the following sections.

Hardware and connection configuration

Configuration steps	Mandatory	Optional
Inserting and configuring an OS		X When additional operator stations are required. The PCS 7 Wizard automatically creates an OS.
Configuring network connections for an OS	X	

Configurations for the OS in SIMATIC Manager

Configuration steps	Mandatory	Optional
Access protection for projects		X
Inserting pictures in the plant hierarchy	X	
AS-OS assignment	X	
Creating block icons	X	
Changing unit and operator texts		X
Defining archive tags		X
Activate the "Transfer to external archive server" option on the OS servers from which data is to be exported to the Process Historian [1)]		X If you use the Process Historian
Configuring messages		X If you want to define messages that deviate from the standard messages
Entering block comments for additional information		X
Specifying the message number range	X	
Defining the message priorities		X Important for messages in the message line of the overview area
Specifying the hiding of messages by "Alarm Hiding"		X If you want to hide individual messages at a certain point in time
Defining the higher level designation	X	

Configuration steps	Mandatory	Optional
Defining the OS area identifier	X[2]	X Operator control and monitoring attributes
Defining the picture names and picture hierarchy		X If you want to define picture names that deviate from the standard names
Setting the update routines: • Update of the AS-OS connections • Update of the OS area identifier		X
Specifying the compilation mode	X	
Compiling the OS	X	

[1] Also assign the archive server to an OS single station system.

[2] Plant hierarchy

After completing all configuration tasks

Step	Mandatory	Optional
Downloading the OS [3])	X	

[3] This function does not apply to an OS single station system.

4.3 Overview of configuration steps in WinCC Explorer

In the following you will find an overview of the individual configuration steps you perform in WinCC Explorer. The steps are listed in the overview tables in the recommended order. You can find detailed information about each individual configuration step in the following sections.

Configuration steps for the OS in WinCC Explorer

Configuration steps	Mandatory	Optional
Setting the object properties		X
Setting the computer properties		X
Setting parameters in the "OS Project Editor"		X If you want to make settings that deviate from the standard settings
Setting up user rights	X	
Visualizing a plant – basics: • Inserting dynamic objects • Using a status display • Using an expanded status display • Inserting an I/O field • Configuring a group display	X Using the desired objects	
Visualizing a plant – advanced: • Using faceplates and block icons that are not created automatically by PCS 7 • Creating user objects • Creating user object templates • Inserting picture windows • Using the process object view and cross-reference lists		X These options support you when you create process pictures
Calculating the group display hierarchy		X
Setting the message system parameters: • Definitions in the "OS Project Editor" • Settings in the "Alarm Logging" editor • Configuration of the message lists • Configuration of the acoustic signaling device		X
Configuring archives and logs	X	
Setting the • Time synchronization • Sign-of-life monitoring	X	X
Setting up the PCS 7 maintenance station		X
Simulation of the OS on the ES		X

Configuration step performed directly on the OS servers/OS clients after downloading the project

Step	Mandatory	Optional
Activating the project	X	

4.4 Use of a reference OS

If you want to use multiple operator stations with the same configuration, we recommend that you configure reference operator stations (referred to as reference OS in the following). A reference OS makes use of another OS as a basis (base OS). You can configure a reference OS for OS single station systems and OS clients.

- If you want to run multiple OS single station systems with identical projects, configure a reference OS single station system ("WinCC Application Ref") for the PC station.
- If you want to run multiple OS clients with identical projects, configure a reference OS client ("WinCC Appl. Client Ref") for the PC station.

Note

The following applies to a multiproject:

The reference OS and the base OS must be located in a shared project of the multiproject.

Basic configuration

The configuring of the base OS comprises the complete configuration of an OS in SIMATIC Manager and WinCC Explorer. The configuring the reference OS comprises the following steps:

- Inserting and configuring the reference OS
- Assigning the reference OS to the base OS

Note

Downloading the OS

After changing the configuration, **all reference OSs** must always be downloaded.

Messages in plants with reference OS

Process control messages and local process control system messages are local information when they are displayed on the following stations:

- Base OS (redundant OS)
- Reference OS single station system

Note

Displaying messages of all OSs

The operator messages of the base OS and the reference OS single station system are visible in the message system of the OS single station systems under the following conditions:

- The system has a Process Historian.
- The archives of the base OS and the reference OS single station systems are synchronized with the Process Historian.

Using Process Historian in a system with reference OS

When you use a Process Historian as an external archive server in a system with reference OS, you must configure the assignment of the archives to the reference OSs.

Additional information

- Section "How to configure a reference OS for an OS single station (Page 46)"
- Section "How to configure a reference OS for an OS client (Page 47)"

4.5 Access protection

Access protection of projects

With PCS 7 V7.0 and higher, a project password can be assigned to provide projects with access protection.

Please contact the Project Administrator if you are unable to edit the PCS 7 project.

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

Access protection in process mode

For operator inputs in process mode you can choose between the following access protection methods:

- Access protection via settings in WinCC Explorer (User Administrator)
  You can find additional information about this in the following documentation
  - Online help *WinCC Information System*, topic "User Administrator"
- Access protection via SIMATIC Logon
  You can find additional information about this in the following documentation:
  - Online help *SIMATIC Logon*
  - Online help for *WinCC Information System*

4.6 Managing projects

Functions for managing projects

The following functions are available for managing PCS 7 projects:

Function	Description
Archiving and retrieving	You can store (archive) all information of a project at a certain point in time in a compressed file (archive file). Retrieving is the restoration of a project from a compressed file (archive file).
Versioning	You can manage the archive files of a project from several points in time.
Comparing	You can compare information saved in an archive file of a project with another archive file or with an opened project. For the OSs the OS objects from the SIMATIC Manager are compared.
Documenting	You can prepare project data in standardized circuit manuals and print them out in a uniform print format.

Additional information

- Manual *Process Control System PCS 7; Engineering System*

Setting the languages 5

5.1 Configuration and user interface languages

OS language settings

The following language settings are relevant for the OS:

- Languages for the operating system
  - Operating system language without a multilingual package
    If only one language will be used, select this language for both process control and configuring
  - Language of the operating system with multilingual package
    If multiple languages will be used, select a multilingual operating system (default is English) and install the additional Multilingual User Interface Packs.
  - Language of the operating system on bundle PCs of PCS 7
    The PCS 7 bundle PCs come with a multilingual operating system. The default language is English; the multilingual packages for German, French, Italian, Spanish and Chinese are installed.

  You can find additional information about installing the operating system, the languages and language switching in the manual *Process Control System PCS 7; PCS 7 - PC Configuration*.
- Language for configuring
  The language for configuring is the language in which the menus, dialog boxes and help texts of PCS 7 are displayed when configuring.
  You make the settings for this in SIMATIC Manager and WinCC Explorer.
- Language for process control
  The language for process control is the language in which texts are displayed during process control.
  You make the settings for this in SIMATIC Manager and WinCC Explorer.

Overview of available languages

The language switchover depends on the PCS 7 installation.

European version on PCS 7

Language	Language for configuring	Language for process control
English	X	X
German	X	X
French	X	X
Italian	X	X
Spanish	X	X

Chinese version of PCS 7

Language	Language for configuring	Language for process control
English	X	X
Chinese	X	X

Overview of the configuration steps

The configuration of the configuration and user interface languages comprises the following topics:

- Setting the languages in SIMATIC Manager (Page 37)
- Setting the languages in WinCC Explorer (Page 38)

5.2 How to set the language in SIMATIC Manager

Overview of language settings in SIMATIC Manager

You make the following language settings in SIMATIC Manager:

- Language for the configuration interface of SIMATIC Manager
- Language for display devices
  You can select languages into which you would like to translate operator-relevant texts. You can also set a default language in which all texts and messages are displayed.

Setting the language for configuring

1. In SIMATIC Manager, select the menu command **Options > Settings…** .
2. Open the "Language" tab.
3. In the "Language" group, select a language from the list.
4. Click "OK".

Selecting the languages for process control

During process control, you can change the language in which texts are shown if there are several languages installed.

1. Select the menu command
   Options > Language for Display Devices… in SIMATIC Manager.
2. If you want to add other languages to the languages installed in the project, select the language in the "Available languages" group and click "-->".
3. If you want to remove a language that is installed in the project, select the language in the "Languages installed in the project" group and click "<--".
4. If you want to change the default language, select the language in the "Languages installed in the project" group and click "Save as default".
5. Click "OK".

Managing multilingual texts

In SIMATIC Manager you can export, translate and re-import texts (e.g. message texts or OS area identifiers) that are stored in a project.

You can find additional information about this in section "How to manage multilingual texts (Page 98)".

5.3 How to set languages in WinCC Explorer

Overview of language settings in WinCC Explorer

In WinCC Explorer, you can make the following language settings:

- Language for the WinCC Explorer configuration interface
- Language for display devices
  You can select languages into which you would like to translate operator-relevant texts.
  You can also set a default language in which all texts and messages are displayed.

Setting the language for the WinCC Explorer configuration interface

1. In WinCC Explorer, select the menu command **Options > Language…** .
2. Select one of the languages shown in the list.
3. Click "OK".

Setting the language for process control

1. In WinCC Explorer, select the "Computer" object in the tree view and select the menu command **Edit > Properties**.
2. Click "Properties".
3. Select the "Parameters" tab.
4. Select the language for process control from the "Language Setting at Runtime" drop-down list.
5. Select the language for process control from the "Default Language at Runtime" drop-down list.

   Note

   The default language at runtime is the language automatically chosen by the system for texts of graphic objects if these texts are not available in the language that was set under "Language Setting at Runtime".

6. Click "OK".

Configuring the OS data in SIMATIC Manager 6

6.1 Configuring the hardware

6.1.1 Overview of hardware configuration

System structure in SIMATIC Manager and in HW Config

You map the configuration of your system in SIMATIC Manager and HW Config. You can configure the following OS project types according to your system structure:

- OS single station system: Systems with one OS
- OS multiple station system Systems with at least one OS server and several OS clients

You will usually work with a multiple station system.

You can find information about OS project types in the section "Configuration of the PCS 7 Operator Station (Page 21)".

Furthermore, you can configure the OS single stations and OS servers for redundant operation. In addition to the normal settings, you have to specify the target and standby OS.

Overview of all the steps involved in the configuration of the hardware

The following table gives you an overview of the individual configuration steps and shows you the program section where each step is performed. The tasks are listed in the table in the order in which they should be performed.

What?	Where?
Setting up the PC stations (network adapters) for the ES, the OS servers and the OS single stations	Simatic Shell, "Configure PC Station" configuration console
Inserting the operator stations into a project as PC stations	SIMATIC Manager
Inserting the WinCC application and hardware components belonging to the OS	HW Config
Setting the OS properties: • Naming the OS • Specifying the target OS (path to the target computer) for: – OS server – OS client • Assigning the standby OS in the case of a redundant OS server • Assigning the base OS in the case of a reference OS • Assigning the standby OS in the case of a redundant OS single station system	SIMATIC Manager

Hardware configuration for a reference OS

Creating and configuring the reference OS comprises the following topics:

- Configuring a reference OS for an OS single station system (Page 46)
- Configuring a reference OS for an OS client (Page 47)

Additional information

- Manual *Process Control System PCS 7; Engineering System*
- *Process Control System PCS 7; High Availability Process Control Systems* manual
- Manual *Process Control System PCS 7; PCS 7 - PC Configuration*

6.1.2 Setting up the PC stations

Settings on all PC stations

To enable configuring, downloading, and testing of all automation systems (AS) and PC stations (such as OS and BATCH) of a PCS 7 project from a central engineering station (ES), you must make the following settings on all PC stations:

- Specification of communication cards for communication via the terminal bus and plant bus
- Setting/checking of access points and operating mode for communication modules on the plant bus

Make these settings on the central engineering station first.

Additional information

- Manual *Process Control System PCS 7; PCS 7 - PC Configuration*
- Manual *Process Control System PCS 7; Engineering System*

6.1.3 Introduction to configuring the OS

Introduction

As a general principle, each OS is managed as a SIMATIC PC station in SIMATIC Manager.

The SIMATIC PC station contains the following objects:

- A WinCC application
- An OS

If you created the multiproject using the PCS 7 Wizard, an OS is already inserted, provided you have activated the corresponding option. You can insert additional operator stations as follows:

- With the PCS 7 Wizard "Expand Project"
  Additional information is available in the *Process Control System PCS 7; Engineering System* manual.
- Manually (described below)

Overview of the configuration steps

Creating and configuring an OS involves the following:

- Configuring the OS (Page 41)
- Setting the OS properties (Page 44)
- Creating the path for downloading the target OS and specifying the standby OS (Page 45)

Optional:

- Creating a reference OS for an OS single station system (Page 46)
- Creating a reference OS for an OS client (Page 47)

6.1.4 How to configure an OS

Introduction

The following table shows the assignment of the WinCC application to the type of OS and the representation in the SIMATIC Manager.

Type of OS	WinCC application	Representation in SIMATIC Manager
OS server or OS single station system	WinCC application	SIMATIC PC-Station(1) WinCC Appl. OS(1)
Standby OS server or standby OS single-station system	WinCC application (stby)	SIMATIC PC-Station(2) WinCC Appl. (Stby.) OS(1)_StBy
OS client	WinCC application client	SIMATIC PC-Station(3) WinCC Appl. Client OSC(3)
Reference OS single station system	WinCC application ref	SIMATIC PC-Station(4) WinCC Appl. Ref. OS-Ref(4)
Reference OS client	WinCC appl. client ref	SIMATIC PC-Station(5) WinCC Appl. Client Ref. Client_Ref(5)

Type of OS	WinCC application	Representation in SIMATIC Manager
Process Historian server	Process Historian appl.	SIMATIC PC-Station(6) Process Historian
Standby Process Historian server	Process Historian appl. (stby)	SIMATIC PC-Station(7) Process Historian (Stby)

Procedure

1. In the component view of SIMATIC Manager, select the project in which you want to insert the operator station.
2. Select the menu command **Insert > Station > SIMATIC PC Station**.
   A new SIMATIC PC station is inserted in the selected project.
3. Select the SIMATIC PC station, select the menu command **Edit > Object Properties** and enter the required name.
4. Select the SIMATIC PC station in the component view and double-click the "Configuration" object in the detailed view to open HW Config.
   The hardware configuration of the SIMATIC PC station opens.
5. If the hardware catalog is not visible, select the menu command **View > Catalog**.
   The hardware catalog opens.
6. Insert the required hardware component:
   – Under "SIMATIC PC Station > CP Industrial Ethernet", select the communications processor installed in the SIMATIC PC station and move it into the PC station using drag-and-drop.
   – If you are using a standard network adapter, select the "IE General" processor.

   The "Properties - Ethernet Interface" dialog box opens.

7. Set the CP's IP address:
   - Set the required address on the bus for the network adapter (CP).
   - If the network adapter is connected to the terminal bus, activate the "IP protocol is being used" check box.
   - If the network adapter is connected to the plant bus, activate the "Set MAC address / Use ISO protocol" check box.
   - For a network card that is connected to the plant bus via BCE, set the "Interval" to "30" in the "Send keepalives for connections" group of the "Options" tab.
     Enter the name in the "General" tab.

     Note

     ISO or TCP/IP

     We recommend that you use the ISO protocol on the plant bus for PCS 7 systems.

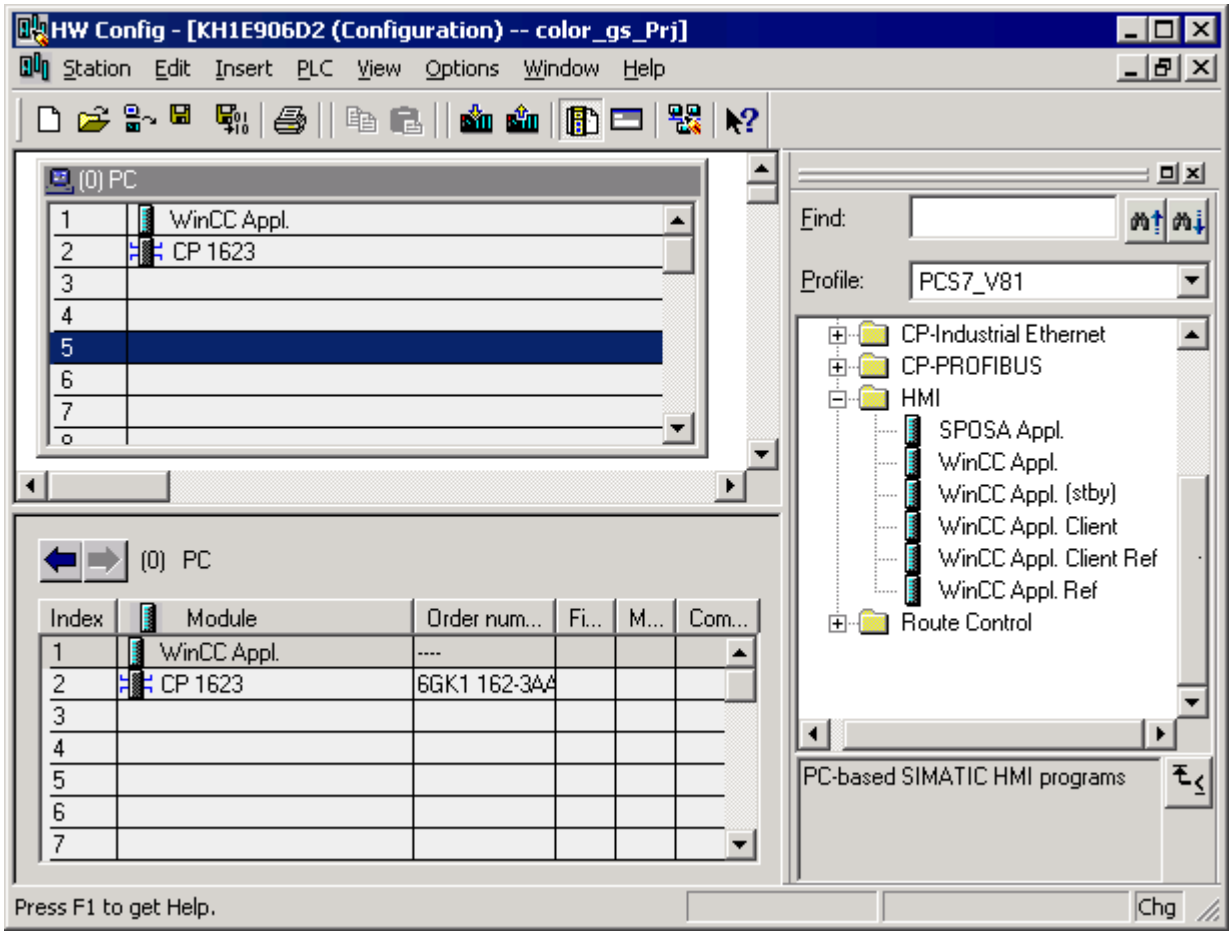
     You must use the ISO protocol if operator station time synchronization take place via BCE.

     Note that you must always use the same protocol for all network modules connected to a plant bus.

     For reasons of performance, avoid using the TCP/IP and ISO protocols simultaneously within a system.
     - If you use the "ISO" protocol, set the MAC address.
     - If you use the "TCP/IP" protocol, set the TCP/IP address.

8. Choose the subnet from the "Subnet" group:
   - If no subnet has been created yet, click "New" and define a new network.
   - If one or more subnets exist, select the desired network in the "Subnet" group.
9. Click "OK".
   The CP is inserted into the PC station.

10. Under "SIMATIC PC Station > HMI" in the hardware catalog, select the desired WinCC application and insert it into the configuration table using drag-and-drop. Refer to the table in the introduction in this regard.



11. Select the menu command **Station > Save**.
    An OS is automatically created in the background and is displayed in SIMATIC Manager
    You can perform additional configuration steps for this OS in WinCC Explorer.

12. If you want to insert additional operator stations, repeat steps 1 to 11.

6.1.5 How to set the OS properties

Introduction

You can make the following settings for the PC station and PCS 7 OS:

- Name of the PC station
- Name of the OS

Procedure

1. In the component view of SIMATIC Manager, select one of the following objects with the name you want to assign or change.
   - SIMATIC PC station
   - OS
2. Select the menu command **Edit > Object Properties**.
   The "Properties – SIMATIC PC station" dialog box opens.
3. Enter the desired name in the "Name" text field.
   Ensure that you assign short and descriptive names that provide some information about the function of the PC station in the overall system.
4. Enter supplementary information in the following text fields if necessary:
   - "Author"
   - "Comment"
5. Click "OK".
   The name of the PC station or OS is updated in the tree view.

6.1.6 How to specify the path for downloading the target OS and standby OS

Overview of settings

The settings you make in the "Properties – OS:" dialog box depend on the OS configuration:

SIMATIC PC station configuration	Necessary settings
• OS client • OS server • OS server (stby) • Reference OS client • Reference OS single station system	For all: • Specify the target OS (path to target computer) For redundant OS server: • Assign the standby OS For reference OS client and reference OS single station system, observe the following sections: • "How to configure a reference OS for an OS single station system (Page 46)" • "How to configure a reference OS for an OS client (Page 47)"

Requirements

The following requirements must be fulfilled before you can specify the target OS and standby OS:

- All required operator stations have been created in SIMATIC Manager.
- Network connections have been configured for all target and standby operator stations using basic Windows functions.

Procedure

1. Below the SIMATIC PC station in the component view of SIMATIC Manager component view, select the OS for which you want to specify a path to the target OS.
2. Select the **Edit > Object properties** command.
   The "Properties – OS:[OS Name]" dialog box opens.
3. Select the "Target OS and Standby OS" tab.
4. Click "Browse" beside the "Path to the target OS computer" text field and enter the path to the target OS.
   The target OS computer is the computer on which the project is to run

   Note

   Enter the path to the target OS without a drive letter prefix:

   \\[Server name]\[Directory name]\...\

5. If you have created a redundant OS server (standby server) for the OS server (master server), assign the master server the associated standby OS from the "Standby OS" drop-down list.
   All the standby operator stations that you created in SIMATIC Manager are displayed in this drop-down list.
6. If you want to have archive tags created automatically with the related system archive, select the "Create/update archive tags" check box.
7. If you use a Process Historian in your project and want to export data to this Process Historian, select the "Transfer to external archive server" check box.

   Note

   You can only select this check box if you have added a Process Historian to your project.

   You can find information on archiving in section "Archiving in PCS 7 (Page 243)".
8. Click "OK".

The settings are complete.

6.1.7 How to configure a reference OS for an OS single station system

Requirement

- The base OS for the reference OS has been created.

Procedure

1. In SIMATIC Manager, create as many SIMATIC PC stations (reference OS) of type "WinCC application ref" as you would like to have single station systems of the same type.
   Create the hardware of the reference OS the same as the hardware of the base OS.
   You can find additional information about this in section "How to configure an OS (Page 41)".
2. In SIMATIC Manager, select the reference OS.
3. Select the menu command **Edit > Object Properties**.
4. Select the "OS ref": Options for OS reference objects" tab.
5. Select the base OS from the drop-down list.
6. Enter the path for the target OS computer.
   You can find additional information about this in section "How to define the standby OS and the path for downloading the target OS (Page 45)".
7. If you are using a Process Historian as an external archive server in the system, observe the following section "Using a Process Historian as an archive server for reference OS".
8. Click "OK".

Using a Process Historian as an archive server for reference OS

If a Process Historian is created as an external archive server in SIMATIC Manager for a system with reference OS, you must make the following settings in the object properties of the base OS and reference OS:

- Storage location for the archives (local or on the external archive server)
- Swap file scope

6.1.8 How to configure a reference OS for an OS client

Requirement

- The base OS for the reference OS has been created.

Procedure

1. Create as many SIMATIC PC stations (reference OS) of type "WinCC appl. client ref" in SIMATIC Manager as you want to have OS clients of the same type.
   Create the hardware of the reference OS the same as the hardware of the base OS.
   You can find additional information about this in section "How to configure an OS (Page 41)".
2. In SIMATIC Manager, select the reference OS.
3. Select the menu command **Edit > Object Properties**.
4. Select the "OS Client Reference Options" tab.

5. Select the base OS from the drop-down list.
6. Enter the path for the target OS computer.
   You can find additional information about this in section "How to define the standby OS and the path for downloading the target OS (Page 45)".
7. Click "OK".

6.2 Configuring the communication paths

6.2.1 Configuring network connections for an OS

Introduction

You configure the communication connections for PC stations in NetPro. As a prerequisite, all operation stations must have already been created in SIMATIC Manager.

You must configure the following connections:

- OS – AS
- ES – AS

Note

To prevent configuration errors, always start the configuring of connections at the OS.

6.2.2 How to configure an OS network connection

Requirement

All operator stations and automation systems in SIMATIC Manager have been inserted and the associated CPs have been inserted and configured in HW Config.

Opening NetPro

1. In the component view of SIMATIC Manager, select the project in which you want to insert the network.
2. Select the menu command**Options > Configure network** command.
   NetPro opens and shows all SIMATIC stations you inserted in SIMATIC Manager.

Configuring the OS - AS connection

1. In NetPro, select the WinCC application of the OS for which you wish to configure a network connection.
   The connection table is displayed in the lower pane.
2. Place the cursor in the first free line of the connection table and select the menu command **Insert > New Connection**.
   The "Insert New Connection" dialog box opens.
3. Select the CPU whose data is to be displayed on the OS as the connection partner in the tree view.

4. Select the required connection from the "Connection" drop-down list.
   – If you want to establish a connection with a "single" station, select the "S7 connection".
   – If you want to establish a connection with an H-station, select "S7 connection fault-tolerant".
5. If necessary, select the "Display properties before inserting" check box.
   This enables you to make settings or changes for the connection.
6. Click "OK".
7. Enter the name of the connection in the "Local ID" column.
   This is a symbolic name and is referred to as a "Named Connection".
8. Repeat steps 1 to 7 for all other operator stations.

Configuring the ES - AS connection

Configure this connection so that you can test the complete functionality of your configuration from the engineering station (ES).

1. In NetPro, select the ES for which you want to configure a network connection.
   The connection table is displayed in the lower pane.
2. Place the cursor in the first free line of the connection table and select the menu command **Insert > New Connection**.
   The "Insert New Connection" dialog box opens.
3. Select the CPU as the connection partner in the tree view.
   The corresponding data appears in the lower pane of the dialog box.
4. Select the required connection from the "Connection" drop-down list.
5. Click "OK".
6. Enter the name of the connection in the "Local ID" column.
   This is a symbolic name and is referred to as a "Named Connection".

   Note

   Symbolic names of the connections

   Ensure that the symbolic names of each connection (OS - AS, ES - AS) are identical.
   - Only then can you simulate the OS on the engineering station after completion of configuration for the purposes of testing all functions.
   - For a reference OS, ensure that the symbolic names of the connections (OS - AS, ES - AS) are identical to the base OS.
     Otherwise, connections to the AS via "Named connection" are not possible.

7. Repeat steps 1 to 6 for all the other automation systems.

Downloading stations

1. Select the required stations.
2. Select the menu command **PLC > Download to Current Project > Selected Stations**.

Additional information

- Online help on the dialog boxes

6.2.3 How to check and modify the configuration

Checking the configuration

Note

The check below needs to be performed if the PC station, hereafter referred to as "OS", meets the following requirements:

- It is connected via a SIMATIC CP to the plant bus with Industrial Ethernet
- It is not integrated into the ES
- It has one of the following configurations:
  - Single station system
  - OS server

The check below does not need to be performed if the OS is an OS client.

1. On the ES in the component view of SIMATIC Manager, select the SIMATIC PC station of the OS with the configuration of an OS server or OS single station system.
2. Select the menu command **Edit > Open object**.
   The "HW Config - [Name of PC station] (configuration) - - Vx.y" dialog box opens.
3. Click on the **Station Configuration Editor** button in the Windows task bar of the OS.
4. Compare the list entries in HW Config on the ES and in the Station Configuration Editor on the OS:
   - The entries in the "Index" and "Name" columns must match, e.g. index ="1" and name = "WinCC application".
   - The name of the PC station in HW Config on the ES must match the entry in the "Station" field in the Station Configuration Editor on the OS.
5. Make any necessary corrections by dragging the list entry in the Station Configuration Editor on the OS with the mouse to the same position as in HW Config on the ES. The procedure can also take place in reverse in HW Config on the ES.
6. Check the status of the connection in the Station Configuration Editor on the OS in the "Status" column. You can find additional information about this in the online help for the dialog box. The following symbol shows that the component is ready for operation:

Checking/defining connection monitoring

Note

The check below needs to be performed if the PC station, hereafter referred to as "OS", meets the following requirements:

- It is not connected via a SIMATIC CP to the plant bus with Industrial Ethernet, but rather via a network module of another manufacturer.
- It is not integrated into the ES
- It has one of the following configurations:
  - Single station system
  - OS server

The check below does not need to be performed if the OS is an OS client.

1. In HW Config, select the network module for connection to the plant bus.
2. Select the **Edit > Object Properties** command.
3. Select the "Options" tab.
4. In the "Send keepalives for connections" group, check whether the intervals per second value is set to "30" and correct the value if necessary. In this case no further settings need to be checked or are necessary.
5. Click "OK".
6. Select the menu command **Station > Save and Compile**.
7. Once the compilation process is complete, select the menu command **Station > Exit**.
   HW Config is closed.

Configuring the network module

Note

The check below needs to be performed if the PC station, hereafter referred to as "OS", meets the following requirements:

- It is not integrated into the ES
- It has one of the following configurations:
  - Single station system
  - OS server

The check below does not need to be performed if the OS is an OS client.

1. Open "**Communication settings**" using the search box in the start menu.
   The "Siemens communication settings" dialog box configuration console is opened.
2. In the tree view under "Modules", select the network module you want to use to establish a connection to the plant bus.
   Check the settings of this network module.
3. Click "Apply" to save your entries.

Assigning the access point

Note

You have to perform this setting on the following PC stations:

- ES
- OS server
- Single station system

1. Select "Access points" in the tree view.
2. Select "S7ONLINE".
3. Select the menu command **Action > Properties**.
4. Set the "Interface parameter assignment used" to "PC internal (local)".
5. Click "OK".
6. Select the menu command **File > Exit**.
   The "Configure PC Station" dialog box closes.

Configuring the target system

1. In the component view of SIMATIC Manager on the ES, select the PC station of the OS.
2. Select the menu command **PLC > Configure**.
3. Click "Configure".
   The "Configure <name>" dialog box opens.
4. Click "OK".
5. Click "OK" to confirm the message shown.
6. Click "Close".
   The dialog box is closed.

Downloading to the target system

1. In the component view of SIMATIC Manager on the ES, select the PC station of the OS.
2. Select the **PLC > Download...** menu command.
   The "Download" dialog opens.
3. Click "Yes".
   The "Stop Target Modules" dialog box opens.

4. Click "OK".
   The download begins.
5. Check the status of the connection in the Station Configuration Editor on the OS in the "Status" column. Icons are used to indicate the status of the component.
   The icon must indicate the status "Component is ready for operation".

Icon	Status of the component
	Component is ready for operation
	Configuration inconsistent

Note

If the "Configuration inconsistent" icon is shown because, for example, the IP address was changed, you must restart the PC of the OS.
If neither of these two symbols is displayed, you can find additional information in the online help of the dialog box.

6.3 Global and specific settings

6.3.1 Overview of global and specific settings

Introduction

Additional settings for configuring the PCS 7 OS are required in SIMATIC Manager in addition to the hardware configuration. You make these settings at two different places:

- Global settings: in the "Customize Plant Hierarchy" dialog box. These settings are applicable throughout the project.
- Specific settings: in the Properties – Hierarchy Folder" dialog box, "Control and Monitoring Attributes" tab. The settings apply only to the selected hierarchy folder.

A representation of both options can always be found in the descriptions of the various settings.

6.3.2 Global setting options

Purpose of the global settings

Global settings apply to the entire project. With these settings you specify certain automatic functions so that PCS 7 automatically assigns the designations for HID, OS areas and picture names.

Setting options

The following settings can be made:

Setting	Meaning
Higher level designation, (abb. HID)	You use the "Included in HID" setting to specify that the HID is automatically formed from the names of the hierarchy folders.
OS area identifier	The "OS area" setting is used to define the selected level as the OS area and to apply it to the area identifier. The definition of an OS area is necessary for area-specific messages in process mode.
Derive picture hierarchy from the plant hierarchy	The picture hierarchy from the plant view is transferred to the PCS 7 OS Picture Tree Manager.

6.3.3 Specific setting options

Purpose of specific settings

The specific settings you make in the "Control and Monitoring Attributes" tab of the object properties are important for process control by the plant operator. You can use these attributes to modify the global settings specifically for individual hierarchy folders.

Setting options

Settings for the control and monitoring attributes can be used to influence the following:

- Higher level designation (HID)
- OS area identifier
- Picture names

6.3.4 Defining the higher level designation

6.3.4.1 Higher level designation

Introduction

The higher level designation (HID) is used to provide unique identifiers for parts of the plant according to their function. The HID is structured hierarchically according to the plant configuration.

The HID is important when you create a tag link for dynamic objects in the Graphics Designer of WinCC Explorer, since the HID is part of the tag name.

In process mode, the HID is displayed in the "Origin" column of the message lists and in the title bar of the faceplate.

Global setting

The names of hierarchy folders can be automatically entered directly into the HID. As a result, the HID can be assembled from of the names of the various hierarchy folders, for example:

[NameHierarchyfolderLevel1]\[NameHierarchyfolderLevel2]"

You can influence which hierarchy level from SIMATIC Manager is to be applied to the HID as well as the number of characters in each section. The specifications you make in the plant hierarchy are applied to the "Control and monitoring attributes" object properties.

Note

To ensure that designations are consistent throughout the project, be sure to assign a suitable name for the hierarchy folders in the plant view when configuring them.

Make sure that the number of characters in the hierarchy folder name does not exceed the number of characters specified for the HID. Names with more characters than the defined limit will not be fully displayed in the HID.

Specific setting – "Control and Monitoring Attributes"

In the "Control and Monitoring Attributes" tab of the object properties, you specify whether the name of a particular hierarchy folder is to be inserted in the HID or removed. The hierarchy levels defined in the plant hierarchy as "Included in HID" are always taken into account when the HID is created.

6.3.4.2 How to specify the settings for the higher level designation

Introduction

You have two options for making the settings for the higher level designation (HID):

- Global setting
- Specific setting – Control and monitoring attributes

Making the global setting

1. In the SIMATIC Manager plant view, select the hierarchy folder that represents the plant.
2. Select the menu command **Options > Plant Hierarchy > Settings**.
3. Enter the number of hierarchy levels in your project in the text field "Number of hierarchy levels".
4. Enter a numerical value in the text field in the "Max. number of characters" column.
   This numerical value defines the maximum length of the name of the hierarchy folder.
   The more hierarchy levels you have in your project and the more levels you want to insert when creating of the higher level designation (HID), the lower the maximum number of characters you should choose. This will enable you to retain a clear overview of the work in the project.
5. In the column "Included in HID", select the check boxes of the levels to be included in the HID.
6. If you want to keep to separate the names of individual levels from one another within the HID, select the relevant check boxes in the column "With separator".
   You see the basic structure of the HID in the "Preview" box.
7. Click "OK".

Making the specific setting – "Control and Monitoring Attributes"

1. In the SIMATIC Manager plant view, select the hierarchy folder that is to have a specific setting applied.
2. Select the menu command **Edit > Properties**.
3. Select the "Control and monitoring attributes" tab.
4. Specify whether the name of the hierarchy folder is part of the higher level designation.
   – If the hierarchy folder is not part of the HID, clear the "Name of the hierarchy folder is part of the HID" check box.
   – If the hierarchy folder is to be part of the HID, select the "Name of the hierarchy folder is part of the HID" check box.
5. Click "OK".
   The name of the hierarchy folder is removed from the HID or added to the HID depending on your setting.

6.3.5 Defining the OS area identifier

6.3.5.1 OS area identifier

OS area identifier for OS areas

The OS areas are derived from the system structure you have created in SIMATIC Manager: A system unit in SIMATIC Manager corresponds to an OS area. An OS area identifier can be defined for these OS areas. The default setting for the OS area identifier corresponds to the name of the hierarchy folder in the plant hierarchy.

Using the OS area identifier

Defining the OS area identifier results in the following:

Phase	Effect of OS area identifier
Process mode	The operator can select particular OS areas and view the associated process pictures. Only messages relating to the OS area currently selected are displayed. The messages are output in the message line of the "Area" column.
Configuration	During configuration, the OS areas are displayed in the object properties of a hierarchy folder on the "Control and monitoring attributes" tab.

Phase	Effect of OS area identifier
OS compilation	• When the OS is compiled, the OS areas are placed in the "Area" user text field in Alarm Logging. • The OS areas are entered in the Picture Tree Manager.
User rights	In large plants, operators are assigned different OS areas. As a result of this, plant operators can only see and make operator inputs in process mode for the OS areas for which they have the corresponding rights. Even when the message list is opened, messages are displayed for only those OS areas for which they have the corresponding rights. This increases the security of operation.

Global setting

The global setting is used to specify the hierarchy level that is to be considered as the OS area. According to this specification, the name of the hierarchy folder that belongs to this level is automatically entered in the lower-level hierarchy folders as the OS area identifier.

Note

When the OS is compiled, the OS areas are transferred to the Picture Tree Manager. The hierarchy levels are always displayed in the Picture Tree Manager, starting with the hierarchy level that is defined as the OS area.

Specific setting – "Control and Monitoring Attributes"

The OS area identifier can be modified for the individual hierarchy folders. This requires that the hierarchy folder be located in the level that was specified as the OS area. The changed OS area identifier is forwarded to all lower-level hierarchy folders, OS pictures, OS reports and messages.

6.3.5.2 How to specify the OS area identifier

Introduction

You can make the settings for the OS area identifier in two different locations:

- Global setting
- Specific setting – "Control and Monitoring Attributes"

Making the global setting

1. In the SIMATIC Manager plant view, select the hierarchy folder that represents the plant.
2. Select the menu command **Options > Plant Hierarchy > Settings**.

3. In the "OS Area" column, select the option button for the level that is used as the OS area.
4. Click "OK".

Making the specific setting – "Control and Monitoring Attributes"

1. In the SIMATIC Manager plant view, select the hierarchy folder that is to have a specific setting applied.
2. Select the menu command **Edit > Object Properties**, and then select the "Control and Monitoring Attributes" tab.
3. Enter the new name in the "OS area identifier" text field.
4. Click "OK".
   The OS area identifier applies to all lower-level objects in the hierarchy.

Note

If you manually assign a different name for the OS area identifier and have confirmed the entry by clicking "OK," PCS 7 automatically selects the "No modification when renaming the hierarchy folder" check box. This ensures that the OS area identifier will **not** be overwritten even if the hierarchy folder is renamed.

6.3.6 Influence of the picture hierarchy on the Picture Tree Manager

6.3.6.1 Relationship between picture hierarchy and Picture Tree Manager

Picture hierarchy in the plant view

You insert pictures in the plant hierarchy according to the structure of your plant in order to visualize the process for the plant operator. You can insert one picture per hierarchy folder. Inserting pictures in the plant hierarchy creates a picture hierarchy, which is an important aspect for managing process pictures. Once the OS is compiled, you will find the same hierarchy in the Picture Tree Manager as in the plant hierarchy.

Plant view and picture hierarchy in the Picture Tree Manager

In the plant hierarchy, you specify whether the pictures you have inserted in the plant view are to be automatically transferred to the Picture Tree Manager. If you have activated this setting, the OS area identifier is automatically updated in the Picture Tree Manager following each renaming of a hierarchy folder in the plant hierarchy.

Note

The hierarchy levels are always displayed in the Picture Tree Manager, starting with the hierarchy level that has been defined as the OS area. Only the hierarchy folders containing an actual picture are displayed in the Picture Tree Manager.

Control and monitoring attributes and picture names

The plant operator sees the picture names in the picture hierarchy of the OS during process mode. You can assign your own picture names for individual hierarchy folders, which are then transferred to the Picture Tree Manager when the OS is compiled. The default setting for the picture names corresponds to the name of the hierarchy folder. You only have to make settings if you do not want to apply the default setting.

6.3.6.2 How to define how the picture hierarchy is applied

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder that represents the plant.
2. Select the menu command **Options > Plant Hierarchy > Settings**.
3. Select the "Derive picture hierarchy from plant hierarchy" check box.
   As a result of this, the picture hierarchy will be transferred from the plant hierarchy to the Picture Tree Manager when the OS is compiled.
4. Click "OK".

Note

When you select this option and then change the picture hierarchy directly in the Picture Tree Manager, these changes are overwritten when the OS is compiled again.

6.3.6.3 How to specify a picture name

Requirement

The "Derive picture hierarchy from the plant hierarchy" check box has been selected in the plant hierarchy settings.

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder for which you want to assign your own picture name.

   Note

   You can only change picture names for those hierarchy folders below the hierarchy level defined as the OS area in the plant hierarchy.

2. Select the menu command **Edit > Object Properties**.
3. Select the "Control and monitoring attributes" tab.
   The name of the selected hierarchy folder is entered as the default name.
4. Enter the desired name in the "Picture name for OS" text field.
5. Click "OK".

   Note

   If you manually assign a different name for the picture name and have confirmed the entry by clicking "OK," PCS 7 automatically enables the "No modification when renaming the hierarchy folder" check box. This ensures that the picture name for the OS will **not** be overwritten even if the hierarchy folder is renamed.

6.3.7 Updating the OS area identifier and name for the OS

Updates in the OS

If you make changes to the following objects in SIMATIC Manager (plant view or project object view), these changes are automatically applied to the WinCC project when the OS is compiled.

Where?	Object
Plant view	• OS area identifier • Picture name
Process object view	• OS area identifier • Picture name • Picture hierarchy

Rules for the consistency of the configuration data

The following configuration is used in PCS 7 for an OS multiple station system:

Adhere to the following rules to ensure a consistent configuration:

- Always derive the picture hierarchy for the OS from the plant hierarchy. This picture hierarchy is mapped in the Picture Tree Manager of the OS.
- Do not make any changes directly in the Picture Tree Manager, for example do not insert additional hierarchy levels or containers or rename pictures there.

CAUTION

Failure to comply with these rules can lead to the following errors:

- For area-specific enables that were set in the "User Administrator" editor, for example: no messages are displayed, displayed messages are incorrect, group display cannot be generated, group display does not function.
- Due to lack of operator permissions, no operations are possible on the PCS 7 Web client/PCS 7 Web Diagnostics client.

Settings for the consistency of the configuration data

The following settings must be made to ensure the consistency of the configuration data:

- In the settings of the plant hierarchy:
  Select the "Derive picture hierarchy from the plant hierarchy" check box.
  You can find additional information about this in section "How to define how the picture hierarchy is applied (Page 61)".
- In the object properties of the hierarchy folder:
  Clear the "No modification when renaming the hierarchy folder" check box (default)

6.3.8 Configuring the overview area

6.3.8.1 How to design button sets for the PCS 7 OS

Purpose of specific settings

You can define the settings for the button sets of the PCS 7 OS globally in PCS 7. You can individually adapt several or all screen resolutions for each button set.

Recommendation: Make the adaptation for all screen resolutions that are used throughout the project.

Note

When you use the specific settings for a button set, new icons will not be inserted automatically in your configuration. You can insert new icons with this function.

Requirement

The settings used in the project for screen resolution are known.

Procedure

1. Open the project on the ES in the component view of SIMATIC Manager.
2. In the tree view, select the SIMATIC PC station of the OS with the configuration of an OS server or OS single-station system.
3. Select the OS project of the OS station.
4. Select the menu command **Options > Central OS settings > Button sets in Runtime.**
   The "Button Sets in Runtime" dialog box opens.
5. Click "Configure".
   The "Button sets configuration" dialog box opens.
6. From the drop-down list, select the button set that you want to adapt and the screen resolution.

Note

Applying different screen resolutions

When you apply different screen resolutions, note the following recommendation:

- Configure the screen resolution for the monitors that have the lowest pixel count for the screen width.
- Optimize the display of the button sets for other screen resolutions, when required.

7. Configure the button area for process mode above the buttons between the "Available keys" and "Selected keys" list.
   You can recognize buttons that do not belong to the standard PCS 7 buttons by the information text in red font.
   - Button set 1 – Button set after starting process mode
   - Button set 2 – Button set with additional functions
   - Message list when using the "Messages with area enable" option in the OS Project Editor
   - Message list when using the "Acknowledgeable messages in separate list" option in the OS Project Editor
   - Message list when using the "Acknowledgeable messages on separate page (switch-selectable)" option in the OS Project Editor

   Note

   Configuring the button area

   You can find information on creating your own buttons in section "How to add your own buttons to the button sets (Page 66)".
   - Multiple selection for all actions is possible by simultaneously pressing the Shift key.
   - If buttons are located outside of the display area, the texts are shown with a red font. Eliminate the gaps between the buttons:
     - Select the buttons between which there are larger distances.
     - Select "Close gaps" in the shortcut menu.
       The selected buttons are positioned side-by-side.
   - When a button set is complete, you can delete unneeded buttons.

   You can find additional information on button sets in the *Function Manual Process Control System PCS 7; OS Process Control*.

8. Select the permission checking and authorization level for the selected key from the "Check" and "Authorization level" drop-down lists in the "Authorization check for selected key" area. You can reset the authorization level to the default settings, when you click the "Reset to default" button.

   Note

   The settings under "Authorization check for selected key" apply for the currently selected button in the "Selected Keys" list. If none or more than one button is selected, the settings are disabled.

   Hiding/unhiding and position of buttons can be independently configured for each screen size. However, the permission checking settings apply for all screen sizes.

9. Click "Preview" to check the changes.
   - You can move the buttons as desired in the preview.
   - Multiple selection is possible by pressing the Shift key.
10. Save the configuration.
11. Repeat the settings for additional screen resolutions if necessary.

12. Close the configuration dialog.
13. Click "Transfer to OS".
    The configuration of the button sets is transferred to the OS projects of the multiproject.

6.3.8.2 How to add your own buttons to the button sets

Introduction

The PCS 7 OS includes PDL files for the picture data for displaying the plant in process mode. Most default files are overwritten during the software update.

The following section describes how to create custom button sets and add them to the project, so that they are retained during the software update.

You create your own buttons for faceplates in the "UserCustomRTButtons.pdl" template file in PCS 7.

Requirement

- Proficiency in the configuring of actions in the Graphics Designer
- If you want to display specific graphics on the buttons, create them as BMP files and stored them in the "GraCS" project folder.

Procedure

1. Open the "UserCustomRTButtons.pdl" template file in the Graphics Designer.
   If the template file is not present, create the "UserCustomRTButtons.pdl" template file.
   Recommended initial procedure:
   – Open the "@Buttons11.pdl" template file in the Graphics Designer.
   – Save the picture under the name "UserCustomRTButtons.pdl" in the "GraCS" folder.
   – Delete all faceplates except for one.

   Note

   Objects with the property "Picture window" (e.g. "Acknowledge horn" and "Acknowledge message") are not suitable as a template.

2. If necessary, make copies of existing faceplates as a template for custom buttons.

3. Adapt the object properties of all faceplates according to the plant requirements while taking the following rules into account.
   The most important adaptations:
   "Properties" tab
   - Button: Object name
   - Button > Miscellaneous: Double-click on the "Tooltip text" attribute in order to all adapt languages
   - Button > Pictures: Static (e.g. "Picture Status On": ./GraCS/MyPicture.bmp)

   "Event" tab
   - Button > Mouse: Mouse click > Action (configure the desired action)

   Note

   Rules for creating faceplates for buttons
   - Each faceplate must have a unique object name in the "UserCustomRTButtons.pdl" template file.
     The object name of the faceplates must not match the names of the standard faceplates.
     Note: The names of the standard faceplates start with "@".
   - The descriptions of the faceplates are adopted by tooltips. Enter brief and clear descriptions for this.
   - Create the graphics with the size of the standard keys.
   - Pay attention to the sizes of fonts, sizes of bitmaps, etc.
   - The authorization level of the buttons can be set only if the "UserCustomRTButtons.pdl" template file has a C-script connected to the property "Operator-Control Enable".

4. When you will configured "Authorization level" for your button, than you have to configured the "Operator-Control Enable" in the "Properties" tab.
   - Button > Miscellaneous: "Operator-Control Enable" set to "Yes"
   - Added a C-Script to the property and inserted this neccessary code:
     ```
     // BEHAVIOUR_DEFINITIONS_BEGIN
     #define PERMISSION_CHECKING_PARAMETERS "0:0" //default
     permission
     // BEHAVIOUR_DEFINITIONS_END
     return SSMCheckStringCodedPermission (lpszPictureName,
     PERMISSION_CHECKING_PARAMETERS);
     ```
   - Configure a trigger for this C-Script with following tags as trigger ("upon change")
     @local::@ActualPicture1
     @local::@ActualPicture2
     @local::@ActualPicture3
     @local::@ActualPicture4
     @local::@CurrentUser
     Using tags @ActualPictureX as trigger guarantees that if permission checking dependent on the picture in working area is configured, the script will be triggered upon picture change to re-check the permission.
     Your favored authorization level can changed in the "Buttons set in Runtime".
5. Save the template file "UserCustomRTButtons.pdl".

Result

You can find the faceplates for buttons contained in the "UserCustomRTButtons.pdl" template file with the following menu command:
Options > Central OS settings > Button sets in Runtime.
You can recognize buttons that do not belong to the PCS 7 standard buttons by the information text in blue font in the corresponding configuration dialog.
You can find information about this in section "How to design button sets for the PCS 7 OS (Page 63)".

Storing the template file

The name of the template file is: **UserCustomRTButtons.pdl**.

- Recommended storage location of the template file "UserCustomRTButtons.pdl" and the pictures inserted in the buttons:
  Default installation directory:
  C:\Program Files (x86)\SIEMENS\WINCC\Options\PDL\Base_Data_Pool
  The template file stored there is OS-independent and does not belong to an OS project.

  Note

  Backing up UserCustomRTButtons.pdl and the pictures inserted in the buttons

  Recommendation:

  Back up the "UserCustomRTButtons.pdl" template file and the inserted pictures to the "GraCS> PCS7CustomPictures" folder independent of the project.

  After a reinstallation of the engineering station, you can copy the template file contained in the project backup and the pictures inserted in the buttons from this folder, back to the default installation directory:
  C:\Program Files (x86)\SIEMENS\WINCC\Options\PDL\Base_Data_Pool

  Note

  Running the OS Project Editor on PC stations involved in process mode

  If you run the OS Project Editor on these PC stations, the following is required:

  An administrator must copy the current template file "UserCustomRTButtons.pdl" and the pictures inserted in the buttons to the default installation directory of all involved PC stations:
  C:\Program Files (x86)\SIEMENS\WINCC\Options\PDL\Base_Data_Pool

- If the installation directory cannot be used (for example, because the user has no authorization to copy files into the "Program Files" directory):
  Copy **this** this "UserCustomRTButtons.pdl" template file and the pictures inserted in the buttons into the "GraCS" folder of **all** OS projects in the PCS 7 project.

  Note

  Insert the copies of UserCustomRTButtons.pdl again

  If the "UserCustomRTButtons.pdl" template file from the default directory cannot be used, the template file must be copied again into the project directories after the following changes:
  - The "UserCustomRTButtons.pdl" has been changed.
  - A new OS has been inserted into the PCS 7 multiproject.
  - A project or subproject was imported into the PCS 7 project.

6.4 Additional tasks for OS configuration

6.4.1 Overview of preparatory work

Preparations for the OS configuration

You must perform the following preparatory steps:

- Setting the AS-OS assignment
- Inserting pictures in the plant hierarchy
- Specifying the option for creating block icons
- Entering multilingual unit and operator texts for faceplates
- Adapting the unit and operator texts
- Configuring messages

Working with the master data library

PCS 7 enables you to create libraries of reusable objects.

When you use the PCS 7 Wizard to create a multiproject, a master data library is created automatically:

- Those objects used in projects or those objects specially adapted for the projects are stored in the master data library. These include, for example, the following elements:
  - Block types
  - SFC types
  - Tag types
  - Models
  - OS pictures
  - OS reports
  - Shared declarations (enumerations, units of measure, equipment properties)
- In addition, the following objects can be included in the master data library.
  - Objects from the Siemens Step 7 process control libraries
  - Objects from libraries of suppliers
  - User-created objects

Recommendation: Use the master data library as the project library.

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

6.4.2 Using the process object view in the OS configuration

Process object view

The process object view is a view in SIMATIC Manager that provides various details about all the process tags in your project. Many of the settings that you can make for the individual objects in the object properties for block instances or pictures can be made more efficiently for several objects in the process object view.

You open the process object view in SIMATIC Manager using the menu command **View > Process Object View** You need the following tabs for the PCS 7 OS:

Tab	What is shown?
Picture objects	• Picture assignments • Picture interconnections
Archive tags	Process values that are archived
Hierarchy folder	Assignment of the pictures to the operator stations with the following information: • Area ID • Picture name • Picture hierarchy

Additional information

- Online help for process object view
- Manual *Process Control System PCS 7; Engineering System*

6.4.3 Setting the AS-OS assignment

6.4.3.1 AS-OS assignment

AS-OS assignment of a hierarchy folder

The AS-OS assignment of a hierarchy folder in the plant view of SIMATIC Manager results in the following in the component view:

- All CFCs and SFCs inserted in the plant view are stored in the chart folder of the assigned AS.
- All OS pictures and OS reports inserted in the plant view are stored in the folder of the assigned OS.

6.4.3.2 How to make the AS-OS assignment

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder for which you want to make the AS-OS assignment.
2. Select the menu command **Edit > Object Properties**.
3. Select the "AS-OS Assignment" tab.
4. From the "Assigned AS" drop-down list, select the S7 program that you want to assign to the selected hierarchy folder.
5. If the lower-level objects have another assignment but you prefer all lower-level objects to have the same assignment, select the "Pass on selected assignment to the lower-level objects" check box.

   Note

   The "Pass on selected assignment to the lower-level objects" check box is only active if the lower-level objects have another assignment or no assignment.

6. From the "Assigned OS" drop-down list, select the operator station you want to assign to the selected hierarchy folder.

   Note

   You can only make this assignment for the hierarchy folder that you have defined as the OS area in the settings for the plant hierarchy. If you have selected a higher-level hierarchy level, the drop-down list is not available.

   The "Pass on selected assignment to the lower-level objects" check box is displayed. This check box is activated by default and cannot become deactivated because all the lower-level OS-relevant objects of an OS area must have the same OS assignment.

7. Click "OK".
   The AS-OS assignment is made and passed to the lower-level objects depending on your setting.

6.4.3.3 Pictures in the plant hierarchy

Introduction

With the help of pictures you can visualize the plant and the plant units, enabling operator control and monitoring of the process by the plant operators on the PCS 7 OS.

Pictures in the plant hierarchy

You insert these OS pictures in the plant hierarchy in order to produce a unique assignment in the plant hierarchy. At the same time, the pictures in the component view are assigned to the appropriate OS. When inserting pictures, bear in mind that you can insert only one picture per hierarchy folder. You configure the pictures and give them dynamic properties later in the Graphics Designer--an editor in the WinCC Explorer.

6.4.3.4 How to insert pictures

Requirement

The appropriate hierarchy folder has been assigned to an OS.

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder in which you want to insert a picture.
2. Select the menu command **Insert > Technological Objects > Picture**.
   - If you have already assigned an OS to the hierarchy folder, the picture is inserted.
   - If you haven't assigned an OS to the hierarchy folder yet and there is more than one OS in your project, a message dialog box is opened in which you can make the OS assignment directly.
   - If you haven't assigned an OS to the hierarchy folder yet and there is only one OS in your project, the picture is inserted, and the hierarchy folder is automatically assigned to the existing OS.
3. Select the picture in the detail view and select the menu command **Edit > Rename**.
4. Enter as short a unique name as possible and press the Enter key.
   The name of the picture is applied.

Note

Make sure that the names of the pictures do not start with two underscore characters. If you wish to use a PCS 7 Web client/PCS 7 Web Diagnostics client for operator control and monitoring of the process, the PCS 7 Web client/PCS 7 Web Diagnostics client is unable to individually assign the pictures to the various OS servers.

6.4.4 Function and creation of block icons

Using block icons

Block icons are used for operator control and monitoring of plants or units in process mode. Block instances and SFC instances that can be operator controlled and monitored from CFC charts are shown as block icons.

Example of a block icon

For example, you can see the process value, setpoint and manipulated variable for a controller in the block icon. The block icon for a closed-loop controller is displayed in a process picture as follows:

Faceplates and block icons

The "Create/Update Block Icons" function automatically positions and dynamizes the ready-made block icons in the selected process pictures. This function can be used to update block icons, when, for example, you have made changes to CFC charts.

Starting from a block icon in a process picture, the plant operator can open the corresponding faceplate in process mode. The faceplate provides the plant operator with additional detailed information and enables operator control of the block.

You can find additional information about this in section "Relationship between faceplates and block icons (Page 175)".

Multiple icons for a block

Different variants of a block icon are required for some blocks. For example, a valve can have a block icon in vertical-mounted position as well as one in horizontal-mounted position. You specify which icon is created in your process picture using a parameter, which you enter in the object properties of the block instance. This parameter is the "type" attribute for the block icon.

You can find the value of the "type" attribute in the "Graphics Designer" editor of WinCC Explorer, in the pictures with the block icons:

- @PCS7TypicalsBasisLibrary<version>..pdl for blocks of the PCS 7 Basic Library
- @PCS7TypicalsAPL<version>.pdl for blocks of the PCS 7 Advanced Process Library

The "type" attribute can be found under "General" in the block icon properties. Enter the value after the forward slash of this attribute, e.g. "2" as the parameter in the block instance.

You can find additional information about this file in section "Block icons and the @PCS7TypicalsAPL<Version> file (Page 176)".

Block icons in the multiproject

You can use the "Create/Update Block Icons" function within the scope of the multiproject. If automatic block icon creation is defined in SIMATIC Manager for process pictures, the "Create/Update Block Icons" function creates the block icons for these process pictures.
You can find additional information on this in section "How to create and update block icons (Page 77)".

The plant hierarchy is not cross-multiproject. Therefore the plant hierarchy and the names of the individual folders must be identical in all projects of the multiproject if block icons are created in a multiproject.

6.4.5 Creating block icons

6.4.5.1 Procedure for creating block icons

Procedure

The following actions are performed to create block icons:

- The "Create/Update Block Icons" function identifies all the pictures for which automatic creation of block icons is planned.
- The "Create/Update block Icons" function identifies all CFCs stored in the hierarchy levels that you specified when you called the function.

  Note

  If the function does not locate any CFC charts or blocks, all of the block icons in the pictures for which automatic creation of block icons is set are deleted.

- The "Zoom block icons" function defines a plant-specific size of the block icons.
- These CFC charts are searched for blocks with the attribute "S7_m_c:=true", indicating they are intended for operator control and monitoring.
- The data for creating block icons is obtained from the blocks listed above and saved in a temporary file. This data is used to place the block icons in the associated pictures and make them dynamic. This links the data to the associated tags of the block instance so that its current values are always displayed in process mode.

6.4.5.2 How to specify the creation of block icons

Introduction

There are two ways of specifying the automatic creation of block icons for process pictures:

- In the object properties of the relevant process picture
- In the process object view

The "Derive the block icons from the plant hierarchy" check box is selected by default for new inserted pictures.

Requirements

The following objects are in a hierarchy folder in SIMATIC Manager:

- A CFC chart
- A picture

Making settings in the object properties of the picture

1. In the detail view of the SIMATIC Manager plant view, select the picture for which block icons are to be automatically created by PCS 7.
2. Select the **Edit > Object Properties** command.
3. Select the "Block icons" tab.
4. Select the "Derive the block icons from the plant hierarchy" check box.
5. Click "OK".
6. Repeat steps 2 through 5 for all the pictures for which you want to automatically create block icons.

Making the setting in the process object view

1. Open the process object view in SIMATIC Manager.
2. In the tree view, select the project folder or any hierarchy folder that contains the pictures for which you want to make the setting for creating block icons.
3. Select the "General" tab.
4. Click on the column header of the "Type" column.
   All objects are sorted and all pictures are displayed one below the other.
5. Navigate to the "Block icons" column.
6. Select the corresponding check box for all pictures for which you want to make the setting for creating block icons.
7. Close the process object view.

You can find additional information about creating block icons in section "How to create and update block icons (Page 77)".

6.4.5.3 How to specify the type of block icon

Procedure

1. Open the plant view in SIMATIC Manager.
2. Double-click the required CFC chart.
   The CFC chart opens.
3. Select the block for which you want to define the block icon and select the menu command **Edit > Object Properties**.
   The "Properties - Block" dialog box opens.

4. In the "Block icon" text field of the "Special Object Properties" group, enter the value of the "type" attribute, e.g. "2" or – for user-defined block icons – "[Name of icon]", in order to create the desired variant of the block icon.

   Note

   You will find this attribute for block icons in the following files:
   - @PCS7TypicalsBasisLibrary<version>..pdl for blocks of the PCS 7 Basic Library
   - @PCS7TypicalsAPL<version>.pdl for blocks of the PCS 7 Advanced Process Library

   Enter the value without a forward slash in front of it.

   You can find information about this in section "Block icons and the @PCS7TypicalsAPL<Version> file (Page 176)".

5. Click "OK".

   Note

   If you want to change the type of block icon for many block instances, use the process object view. In the process object view you can make many changes quickly and conveniently.

   Select the "Blocks" tab and enter the value of the "type" attribute in the "Block icon" column.

6.4.5.4 How to create and update block icons

Introduction

You can achieve the actual creation of block icons as follows:

- By executing the "Create/Update Block Icons" function

This method is described below:

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder containing the pictures for which you want block icons to be created.
2. Select the menu command **Options > Plant Hierarchy > Create/Update Block Icons**.
   The "Create/Update Block Icons" dialog box opens. You are then shown all pictures for which you activated the "Create block icons" option in the object properties and which are located in the hierarchy folder and in the lower-level hierarchy folders. By default all pictures are selected for the creation of block icons.
3. Clear the checkboxes of pictures for which you do not want to create block icons.
4. From the "Lower hierarchy levels included" drop-down list, select the number of lower hierarchy levels that are to included when creating the block icons.
5. If you want to specify a plant-specific size of the block icons, adapt the zoom factor in the "Zoom block icons" area.

6. If you select the "Position block icons automatically" check box, the block icons are automatically inserted into the pictures when you create the OS pictures.
7. Click "OK".
   The function is executed. All block icons are stored in the corresponding process pictures.

Note

After creating/updating block icons, compile the Operator Station so that the required tags are created in the PCS 7 OS. Only then will the tag interconnections in the process pictures of the PCS 7 OS be corrected automatically when blocks or charts are changed or renamed.

6.4.6 Adapting the unit and operator texts

6.4.6.1 Unit and operator texts

Units and operator texts in faceplates

For the visualization of the process in process mode, you use faceplates that display items such as measured values, operating limits, and unit and operator texts of the block to the plant operator. These texts are already included in the block types you use for a CFC chart.

You can find detailed information about faceplates in section "Using Faceplates (Page 174)".

Special feature of unit and operator texts

Unit and operator texts only exist in one language in the block types. The default language here is English. For this reason, in process mode, the unit and operator texts are only displayed in the language that is stored for the block types in SIMATIC Manager, irrespective of the current language selection.

Multilingual versions of unit and operator texts can be displayed in the process control.

You can find additional information about this in section "How to change unit and operator texts in foreign languages (Page 79)".

Unit and operator texts in the block types

The unit and operator texts are stored in the object properties for the block types. In order to view the default texts, open the object properties of the block from within a CFC and select the "I/Os" tab. You will find the following columns in this tab:

- "Unit" and "Identifier": These texts are used for the display of analog connections.
- "Text 0" and "Text 1": These texts are used for the display of statuses of binary I/O.

6.4.6.2 Adapting unit and operator texts

Adapting unit and operator texts

If you want to adapt texts for units and operator texts, perform the following action:

- Adapt the preassigned texts for the block types and/or block instances.

The following actions require a different procedure:

- Adapting the texts for a block type
- Adapting the texts for block instances

Adapting the texts for a block type

If you want to adapt texts for a block type, you only have to adapt the unit and operator texts once in the project library. You can then generate the block instances in the CFCs from the block types of the project library. You therefore do not have to adapt the texts for each individual instance.

NOTICE
Always create your own project library. If you want to adapt block types, copy them to your project library. Always make changes to unit and operator texts for a block type at the beginning of configuration. If you have already created CFCs in the project, you change the unit and operator texts exclusively in the individual block instances.

Adapting the texts for block instances

If you have already created block instances in your project, you must subsequently edit them. You can use the process object view to conveniently edit the block instances.

6.4.6.3 How to edit texts for a block type

Note

Make sure you place the block type in your project library **before** modifying the unit and operator texts.

Only adapt the block types if you haven't created any block instances yet.

Overview of the steps

Step	Action
1	Determining the required I/Os
2	Changing the unit and operator texts in the "LAD/FBD/STL" editor

Step 1 – Determining the required I/Os

Since the "LAD/FBD/STL" editor does not tell you which I/Os have been provided with unit and operator texts, you must make the following preparations:

1. Open any view in SIMATIC Manager: Component view, plant view or process object view.
2. Create a CFC.
   This chart is only used for the purposes of this task and has nothing to do with the actual project.
3. Open the CFC chart.
4. Drag the block, whose unit and operator texts you want to change, into this CFC chart.
5. Select the block in the CFC chart and select the menu command **Edit > Object Properties**.
6. Open the "Inputs/Outputs" tab.
7. Take note of all the I/Os that have an entry in the columns "Identifier", "Text 0" and "Text 1". Then edit these I/Os in the "LAD/FBD/STL" editor.

Step 2 - Changing the unit and operator texts in the "LAD/FBD/STL" editor

1. Open any view in SIMATIC Manager.
2. Select the menu command **Options > Language for display devices**.
3. Select the desired display language as the default language and then click "OK".

NOTICE
When recompiling the OS, be sure to always set the same "Language for display devices" that you have specified in step 3.

4. Open the project library and select the folder "[Name of the project library]/[Name of the S7 program]/Blocks" in the tree view.
5. Select the required block in the detail view.
6. Select the menu command **Edit > Open Object**.
   The LAD/STL/FBD editor is opened. The unit and operator texts for the connections can be edited there.
7. Go to the tree view or detail view and select an I/O that you made a note of in "Step 1".
8. Open the shortcut menu and select the **Object Properties** command.
   The "Properties – Tags" dialog box opens.
9. Select the "Attributes" tab.

10. Change the values of the following attributes:
    - In order to change analog unit and operator texts, select the attributes "S7_unit" and "S7_shortcut".
    - In order to change binary unit and operator texts, select the attributes "S7_string_0" and "S7_string_1".
11. Click "OK".
12. Repeat steps 6 to 11 if you wish to change any further unit and operator texts.
13. Close the "LAD/STL/FBD" editor.
    The block type is changed; consequently, whenever you use this block type from the library, the changed unit and operator texts automatically appear.

6.4.6.4 How to edit texts of block instances

Requirement

In the properties of the block instance, the required I/Os have been activated in the "Parameter" column so that they are visible in the process object view.

Procedure

1. Open the process object view in SIMATIC Manager.
2. Select the "Parameters" tab.
   The data is updated.
3. In the "Filter by column" drop-down list, select "Block type".
4. In the "Filter text" text field, enter the name of the block type, e.g. "meas_mon".
   The data is filtered according to the selected filter criteria.
5. Depending on the type of text, choose the desired column and change the unit and operator texts.
   The texts are changed in the object properties of the block instances.

6.4.7 Defining archive tags

6.4.7.1 Archive tags

Specifying process values for archiving

You specify whether or not a process value is to be archived using an attribute of the block I/O. This is possible only if operator control and monitoring of the block I/O is enabled. Select the type of archiving from a drop-down list.

Types of archiving

You can make the following settings:

Setting	Meaning
No archiving	The data will not be archived. This is the default setting.
Archiving	The data will be archived on the OS server. If process values are displayed in a trend in process mode, PCS 7 displays the data located locally on the OS server.
Long-term archiving	This type of archiving is relevant if you use a Process Historian in your plant. Initially, the data is archived locally on the OS server as defined by the "Archiving" setting. The data is also archived on the Process Historian and subsequently stored in a long-term archive. The data from the long-term archive can be exported to external data media, for example, an external server or data storage medium. When process values are displayed in a trend in process mode, PCS 7 first accesses the data located locally on the OS server in the long-term archive. If you want to display data that is no longer available locally on the OS server, PCS 7 automatically takes the values from the Process Historian. This is assuming that you have configured and activated a Process Historian.

You can find additional information about archiving and the Process Historian in section "Archiving with PCS 7 (Page 243)".

Definition of archiving type for archive-relevant process values

You can define the archiving type in two places:

- In the process object view, "Parameters" tab, "Archive" column:
  In the process object view, you can enter the setting quickly and conveniently. Please note that in the process object view you only have access to tags intended for representation in the process object view.
  You can find additional information about the process object view in manual *Process Control System PCS 7; Engineering System*.
- In the CFC editor, object properties of the block, "Inputs/Outputs" tab

6.4.7.2 How to identify tags for archives

Identifying tags in the process object view

1. Open the process object view in SIMATIC Manager.
2. Select the folder in which you stored the required CFCs in the tree view.
   The corresponding data is displayed in the detail view.
3. Select the "Parameters" tab.
   The data is updated.

4. Switch to the "Archive" column.
   All archive-relevant block I/Os have the default value "No archiving" entered. You cannot make any entries in the text fields of the other block connections.
5. Click inside the text field of the required block connection.
6. Select the desired archiving type from the drop-down list box
7. Perform this setting for all I/Os you want to archive.

Identifying tags in the object properties of the block

1. Open the plant view in SIMATIC Manager.
2. Double-click the CFC that contains the archive-relevant block I/Os.
   The CFC opens.
3. Select the required block and then select the menu command **Edit > Object Properties**.
   The "Properties - Block" dialog box opens.
4. Open the "Inputs/Outputs" tab.
5. Switch to the "Archive" column.
   All block connections that are defined as enabled for operator control and monitoring are entered with the default value "No archiving".
6. Click inside the text field of the required block connection.
7. Select the desired archiving type from the drop-down list box
8. Perform this setting for all I/Os you want to archive.
9. Click "OK".
10. Repeat steps 2 through 9 for all blocks for which you want to archive process values.

6.4.8 Configuring messages

6.4.8.1 Message configuration

Introduction

Messages are important for the plant operator for process control. Plant operators can monitor and evaluate the process with the aid of messages. Message texts and message classes are preset for block types. Examples of messages are "Actual value too high," "External error," and "Overdosage".

Message configuration

Messages are configured during configuring within the framework of creating CFC charts. If you use a block with message capability in a CFC chart, for example, the "Dose [FB63]" block, specific message texts with associated message class and message type are preset via a default setting. These messages are sent by the automation system when the corresponding event occurs. You can adapt these message texts and their attributes to your particular needs:

If …	… you have to
You want to change a message text for an individual block instance in a CFC chart,	Configure the messages directly in the block instance in a CFC chart.
You want to modify a message text for a block type in order to create instances,	Change the block type directly.

Note

Create your own project library at the start of configuration.

Only change the messages for a block type at the start of configuration. If you have already created CFC charts in the project, change the messages in the individual block instances.

6.4.8.2 How to configure project-specific messages

Procedure

1. Open the plant view in SIMATIC Manager.
2. Select the menu command **Options > Language for display devices**.
3. Select the desired default language.
4. Carry out steps 5 or 6 depending on whether you want to change a block instance or a block type.

   Note

   If you have already created CFC charts, only change the messages in the individual block instances.

5. If you want to change the message texts of an individual block instance, proceed as follows:
   - In the tree view, select the hierarchy folder in which the required CFC is stored.
   - Double-click the CFC chart in the detail view.
   - Select the block whose message attributes or texts you want to change in the CFC. Alternatively, you can change the alarm texts in the block instances, including in the process object view.
   - Proceed to step 7.

6. If you wish to change the message texts of a block in a project library, proceed as follows:
   - Open your project library.
   - Open the tree view and select the folder "[Name of the project library]/[Name of the S7 program]/Blocks".
   - Select the required block in the detail view.
7. Select the menu command **Edit > Special Object Properties > Messages**.
   The "PCS 7 Message Configuration" dialog box is opened, and the default messages for this block are displayed in tabular form.
8. Change the default message text in the "Event" column.
9. If the plant operator is to acknowledge a message, select the check box of the associated message in the "Single acknowledgment" column.
10. Save your entries.
    - If you have changed a single block instances, click "Save".
    - If you have changed a block in a project library, click "OK".

    Note

    If you also want to change the message text in the other installed languages, change the "Language for display devices" accordingly.

    To do this select a default language in steps 2 and 3 and repeat steps 4 through 10.

Displaying project-specific texts

Note that certain block information is only displayed or only obtains meaning on an operator station if appropriate adaptations have been made in the configuration phase.

Examples for the block EventTS:

- **Output block comment on the OS**
  In order for the block comment to be output on the OS, the default text must be adapted in the CFC.
- **Output message texts**
  Default texts are output for messages of the block that are not configured (e.g. InTS1 Status 16). Replace the default texts with a project-specific message text when configuring. Example:
  - $$BlockComment$$ InTS1 Status 16#@1%x@
    is replaced with
  - $$BlockComment$$ <Runtime error>Status 16#@1%x@

You can find additional information about this in section "Compiling OS data (Page 91)".

6.4.9 Use of block comments

Introduction

You can use block comments to add descriptive text that will be displayed in addition to the higher level designation (HID). The HID is automatically formed from the names of the various hierarchy folders and cannot be changed. You can specify the descriptive text yourself. You use block comments for this purpose. You can individually assign these block comments to each block instance.

Block comments in process mode

The HID and the descriptive text are important in process mode in two situations:

Location	For what purpose?
In a message	The block comment is displayed in a message as supplementary information in the event text in a message (Page 86).
In a faceplate	The window line in a faceplate displays the block comment, and by default the title line displays the higher level designation.

6.4.10 Expanding the event text of a message

6.4.10.1 Event text of a message

Message form

In process mode, a message includes the following information:

Date	Time	Priority	Origin	Event
08.11.06	9:27:17.677	1	Plant1/RMT1/CFC_FC111/MEAS_MON	Too high

Event text in a message

Based on this standard message, the plant operator cannot immediately identify which property is "too high". The block comment is an option of adding information to the event text, for example, "reactor filling level": You can enter this supplementary text for each block instance in a CFC chart.

Function of expanded event text

The expanded event text is controlled using the following two factors:

- Keyword
- Block comment

Each block has a standard defined event text. In PCS 7, the keyword is added as a prefix to this event text: "$$BlockComment$$". When this keyword is present, the entry in the "Comments" text field is read out and displayed along with the event text in the message in process mode.

6.4.10.2 How to add block comments

Procedure

1. Open the plant view in SIMATIC Manager.
2. Double-click the CFC containing the block instances you want to adapt.
   The CFC opens.
3. Select the required block and then select the menu command **Edit > Object Properties**.
   The "Properties - Block" dialog box opens.
4. Enter the explanatory text in the "Comment" text field. This text appears as additional information for the event text and in the window line of the faceplate.

   Note

   To ensure that the event text in the message is shown in full in process mode, enter a maximum of 16 characters for the block comment.

5. Click "OK".

Note

If you are looking for a quick and easy way of changing the block comments for a large number of block instances, use the process object view.

Select the "Blocks" tab.
Enter the explanatory text in the "Block comment" column.

6.4.10.3 How to delete the supplementary information of the standard event text

Introduction

If you do not need supplementary information for the event text and you even want to prevent display of the standard texts, make this setting once for all block types.

Note

Make sure you store the block type in your project library before making adaptations.

Only make this adaptation for block types if you haven't created any block instances yet.

Procedure

1. Open SIMATIC Manager.
2. Select the menu command **File > Open…**.
3. Select the "Libraries" tab, select your project library and click "OK".
   The project library opens.
4. Select the block type for which you want to make the adaptation and select the menu command **Edit > Special Object Properties > Message…**.
   The "PCS 7 message configuration" dialog opens.
5. For all message texts for which supplementary text is not to be displayed, delete the text "$$BlockComment$$" in the "Event" column.
6. Click "OK".
7. Repeat steps 4 through 6 for all block types for which you want to make this setting.

6.4.11 Specifying message priorities

6.4.11.1 Message priorities

Using the message priority

Every message has a defined priority. The priority is used to ensure that the message line in the overview area always displays the message that meets the following criteria:

- Not yet acknowledged
- Highest priority

In this way, important messages are never overwritten by unimportant messages.

Specifying message priorities

By default, the latest message is always the first message displayed in the message list. You can change this setting in WinCC Explorer. For example, you can specify "Priority" as the sort criterion for a message list. This allows the plant operator to sort message lists in process mode according to priority in ascending or descending order.

You specify the message priority specifically for each individual message in the block type or block instance. A total of 16 priorities are available, whereby "16" is the highest priority and "0" is the lowest. If no priority is explicitly specified, the default setting is 0.

Note

You can only specify message priorities if you have defined the message number range as "CPU-wide unique".

Special feature of message priority 16

In process control, the "Highest Priority Messages" button is displayed to the left of the message line if at least one priority 16 message is active (incoming status or incoming, acknowledged status). This button is used to access the "Highest Priority Messages" list, which provides the operator with a quick overview of all active priority 16 messages.

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

6.4.11.2 How to specify a message priority

Specifying the message priority for a block type

If you are using the "User-configurable message classes" function, this section is not relevant. Information on user-configurable message classes can be found in the section "Configuring the PCS 7 message system" in the "PCS 7 Engineering System" manual.

Note

Important steps

Create your own project library at the start of configuration.

Then specify the message priority in a block type at the start of configuration.

---

1. Open your project library in SIMATIC Manager.
2. Open the tree view and select the folder "[Name of the project library]\[Name of the S7 program]\[Name of the block folder].
3. Select the required block in the detail view.
4. Select the menu command **Special Object Properties > Message...**.
   The dialog box "PCS7 Message Configuration - [name of the project library]\[name of the S7 program]\[name of the block folder]\[name of the block]" opens.
5. Switch to the "Priority" column and position the mouse pointer in the line containing the message you want to change.
6. Select the desired priority from the drop down list box
7. If you want to define a priority for further messages, repeat steps 3 and 4.
8. Click "OK".

Specifying the message priority for a block instance

1. Open the plant view in the SIMATIC Manager.
2. Double-click the required CFC chart.
   The CFC chart opens.

3. Select the block whose message priority you want to change in the CFC.
4. Select the menu command **Edit > Special Object Properties > Messages**.
   The "PCS 7 Message Configuration" dialog box is opened, and the default values for this block are displayed in tabular form.
5. In the "Priority" column, change the priority for all desired messages.
6. Click "Save".
   The priorities are applied to this block instance.

Note

If you want to change the message priorities for many block instances, open the process object view and select the "Messages" tab. Change all desired priorities in the "Priority" column.

6.5 Compiling OS data

6.5.1 Compiling the OS

Introduction

Once you have finished configuring all of the data in SIMATIC Manager, you must compile the OS before starting to configure the OS data in WinCC Explorer. All of the data from SIMATIC Manager, such as tags, messages and texts as well as the hardware and connection configurations are "made known" to the OS.

Calling the "Compile OS" function

Depending on your requirements, PCS 7 offers you the following options for compiling the OS:

If you …	… then
Want to compile an individual OS	Select the OS in the component view of SIMATIC Manager, and select the menu command **Compile** in the shortcut menu.
Want to compile several operator stations	Select the desired project in the component view of SIMATIC Manager and select the menu command **Options > 'Compile Multiple OSs' Wizard > Start...**
Want to compile and download several operator stations	Select the multiproject or project in the component view of SIMATIC Manager and select the menu command **CPU > Compile and Download Objects**. In the "Compile and Download Objects" dialog box, you can then select the check boxes for the desired operator stations, make the compilation settings and start the compiling and downloading process.

Note

Working with a multiproject

If you are working within a multiproject, be sure to merge all projects in the multiproject again prior to compiling the entire OS.

Make sure that all S7 programs within the multiproject have unique names.

6.5.2 Type of data to be compiled

Data required for the OS

During compilation, the following information is made known to the OS:

- Assignment of S7 programs to operator stations.
  Make this assignment in the wizard for compiling the OS.
- Areas defined in SIMATIC Manager
  These OS areas are important for proper assignment of messages in process mode, for the picture hierarchy and for assignment of user rights.
- Tags, messages and texts that arise or are configured when CFCs are created.
  These objects must be compiled in order for you to access them during OS configuration.
- Archive tags that were identified as archive-relevant in the properties of block I/Os
- Structure types created through the use of certain block types in CFC charts
- SFCs that are visualized for process mode.
  This enables the plant operator to monitor the representation of the process in the form of SFCs in process mode.
- Structure for storing process pictures in the plant hierarchy, which is mapped in the form of the Picture Tree in WinCC
- Block icons created from the block types of a CFC chart
- Network connection parameters from NetPro

Note

Since not all of the characters in the ES configuration data are permitted in a tag name in the OS, illegal characters (special characters) are replaced with "$".

The following characters are converted:
['] [.] [%] [\ ] [*] [?] [:] [space char]

6.5.3 Properties of the compilation modes

Introduction

You can compile the operator stations in two different modes. This setting determines the setting options you are offered in the second step of the "Compile Multiple OSs" wizard.

Compilation modes

You must set the compilation mode separately for each project of a multiproject. The following modes are available:

Mode	Meaning
Area-oriented	With this setting, you assign an OS area of the PH to an OS server. The advantage of this setting is that PCS 7 checks which data are relevant to the OS server. Only these data are transferred. This is the default setting for projects created in PCS 7 Version 6.1 and higher.
AS-oriented	With this setting, you assign an S7 program to an OS server. This allows you to specify which OS accesses data on which AS. In this compilation mode, all the data of an automation system is assigned to an OS server. This is the default setting for all projects created with a PCS 7 Version prior to V6.1.

6.5.4 How to set the compilation mode

Procedure

1. Open any view in SIMATIC Manager: Component view, plant view or process object view.
2. Select a PCS 7 project from the tree structure.
3. Select the menu command **Options > 'Compile Multiple OSs' Wizard > Compilation Mode…**. The "Compilation mode" dialog box opens.
4. Select the appropriate option button. The following options are available:
   – "Area-oriented": If you want to assign the "OS area of the PH to an OS server" during OS compilation.
   – "AS-oriented": If you want to assign "one or more S7 programs to an OS server" during OS compilation.

   Note

   A complete compilation is required after changing the compilation mode.

5. Click "OK".

6.5.5 How to compile an individual OS

Requirement

- The correct "Language for display devices" is set.
  It is necessary to check the language if you have modified unit or operator texts of the block types in the project library.

Procedure

1. In SIMATIC Manager, open the component view.
2. Select the OS you want to compile in the tree view.
3. Open the shortcut menu and select the menu command **Compile**.
   The "Wizard: Compile OS" opens, which will take you through the compilation process step-by-step.
4. Perform the following steps, as described in section "How to compile multiple operator stations (Page 94)".

6.5.6 How to compile multiple operator stations

Requirements

- The correct "Language for display devices" is set.
  It is necessary to check the language if you have modified unit or operator texts of the block types in the project library.
- The PCS 7 project is opened in SIMATIC Manager in one of the following views: component view, plant view or process object view.
- A PCS 7 project is selected in the tree view.
- Compilation mode is set. You can find additional information about this in section "How to set the compilation mode" (Page 93).

Procedure - AS-oriented compilation

1. Select the menu command **Options > 'Compile Multiple OSs' wizard' > Start...** .
   The wizard opens; it will guide you step-by-step through the compilation process.
2. In the "Introduction" step, click "Next".
   The step "Which S7 programs do you want to assign to which operator station?" is displayed.
3. Select the S7 program on the left-hand side and the OS on the right.

4. Click "- ->" to assign the S7 program to the selected OS.

   Note

   The OS servers require the S7 programs from all the automation systems from which they obtain process data. If you are working in a multiproject and the OS servers access automation systems from other projects, you also have to assign S7 programs from other projects in the multiproject.

5. Click "Next".
   The step "Which operator stations do you want to compile and with which S7 programs?" appears, and all the check boxes are selected by default.
   If necessary, clear the check boxes of the OSs or S7 programs that you do not want to include in the compilation process.
6. Select the required S7 program on the right-hand side if you wish to assign another network connection to the S7 program.
7. Click the "Connection" button.
   The "Select network connection" dialog box opens.
8. Select the required network connection.
9. Click "OK".
10. Click "Next".
    The "Select the data you want to compile and the scope of the compilation" step is displayed. In this step you specify which data is to be compiled.
    You can find additional information about this in the online help for the "Wizard: Compiling Multiple OSs" dialog box.
    Default settings (selected options):
    - "Tags and messages" check box Selected
    - "SFC visualization" check box: Selected
      (display of SFCs in process mode)
    - "Picture Tree" check box: Selected
    - "Minimum acquisition cycle of the archive tags:" drop-down list: 1 second
      (Project-specific setting):
    - Scope (data to compile) "Entire OS":
      You must always compile the entire OS the first time an OS is compiled. After changes you can select the "Changes" check box.
11. Click "Next".
12. In the "Check the selected options" step, check the settings that you have defined in the individual steps. If necessary, click "Back" to change to previous steps and change the settings.
13. Click "Compile".
    The OS data is compiled.

Procedure - Area-oriented compilation

1. Select the menu command **Options > 'Compile Multiple OSs' wizard' > Start...** .
   The wizard opens; it will guide you step-by-step through the compilation process.
2. In the "Introduction" step, click "Next".
   The step "Which areas do you want to assign to which operator stations?" is displayed.
3. Click inside a field in the "OS assignment" column.
4. From the drop down list box, select the OS that you want to assign to the area named in the same line in the "Area" column.
5. Click "Next >".
   The step "Select the network connections for the S7 programs associated with the areas" is displayed.
6. Select the S7 program for which you want to define the network connection.
7. Click the "Connection" button.
   The "Select network connection" dialog box opens.
8. Select the required network connection.
9. Click "OK".
   Follow this procedure for all other S7 programs.
   Click "Next".
   The step "Select the data you want to compile and the scope of the compilation" is displayed. In this step you specify which data is to be compiled.
   You can find additional information about this in the online help for the "Wizard: Compile Multiple OSs" dialog box.
   Default settings (selected options):
   - "Tags and messages" check box: Selected
   - "SFC visualization" check box: Selected
     (display of SFCs in process mode)
   - "Picture Tree" check box: Selected
   - "Minimum acquisition cycle of the archive tags:" drop-down list: 1 second
     (Project-specific setting):
   - Scope (data to compile) "Entire OS":
     You must always compile the entire OS the first time an OS is compiled. After changes you can select the "Changes" check box.
10. Click "Next".
11. In the "Check the selected options" step, check the settings that you have defined in the individual steps. If necessary, click "Back" to change to previous steps and change the settings.
12. Click "Compile".
    The OS data is compiled.

6.5.7 How to compile and load multiple operator stations

Requirements

- If you are using OS servers and OS clients in the project:
  - The OS clients have been assigned to the OS servers.
- If you are using one of more reference OS in the project:
  - The reference OS has been assigned to the base OS.
  - The base OS has already been compiled for the purpose of downloading the reference OS.
- The correct "Language for display devices" is set.
  It is necessary to check the language if you have modified unit or operator texts of the block types in the project library.
- The compilation mode is set.

Procedure

1. Open any view in the SIMATIC Manager: component view, plant view or process object view.
2. Select a project in tree view.
3. Select the menu command **PLC > Compile and Download Objects...**.
   The "Compile and Download Objects" dialog box opens.
4. In the "Selection table" group, select the OS that you want to compile and download.
5. Click "Edit".
   The "Settings: Compile OS" dialog box is opened. Depending on which compilation mode you have selected, now follow the procedure described in section "How to compile multiple operator stations" (Page 94).
6. Click "Start".
7. Close the "Compile and Download Objects - Notepad" report.
8. Click "Close".

Further information

- Manual *Process Control System PCS 7; Engineering System*

6.6 Managing multilingual texts

6.6.1 How to manage multilingual texts

Introduction

If you want to display texts (for example, message texts or OS area IDs), which are stored in SIMATIC Manager, in more than one language during process control, use the SIMATIC Manager export/import function to change the multilingual texts.

Requirement

All required languages are installed.
You can find additional information in section "Configuration and user interface languages (Page 35)".

Procedure

1. In SIMATIC Manager, open the component view.
2. Select the project in the tree view.
3. Select the menu command **Options > Manage Multilingual Texts > Export...**.
   The "Export user texts" dialog box opens.
   Enter the settings.
   If necessary, change the storage path for the export file.
   Check the setting in the "Format" field. The "Excel spreadsheet (*.csv)" format must be selected. Change the settings, if necessary.
4. Click "OK".
   A CSV file is created.
5. Make the required changes in the CSV file.

   Note

   If you change individual texts using the export/import functions in CFC, SFC or PH, bear in mind that you compile the text identically at all points (e.g. for all block types and copies of a block). Otherwise, inconsistencies may arise, leading to the incorrect language version of the texts appearing.

6. After entering the changes, select the menu command **Options > Manage Multilingual Texts > Import...** and import the modified CSV file.
7. Compile the OS.
   You can find additional information about this in section "Compiling the OS data".
8. Download the OS.
   You can find additional information about this in section "Downloading a project and configuration changes".

Additional information

- Online help on the dialog boxes
- *Process Control System PCS 7; Engineering System* manual

Configuring the OS data in WinCC Explorer 7

7.1 Working with the WinCC Explorer

Introduction

You configure the OS in WinCC Explorer.

Opening WinCC Explorer

1. In SIMATIC Manager, open the component view.
2. Select the desired OS in the tree view.
3. Select the menu command **Edit > Open Object**.

Note on plant structure

NOTICE
Avoid modifications in WinCC that affect the plant structure you created in SIMATIC Manager. SIMATIC Manager is used exclusively for creating and maintaining the plant structure. Otherwise, data might be overwritten or might not be updated when the OS is compiled.

7.2 Editors in WinCC Explorer

Introduction

You have access to various editors in WinCC Explorer within the OS.

Opening editors in WinCC Explorer

There are two ways to open editors:

- Select the required editor in WinCC Explorer, and then select the **Open** command from the shortcut menu.
- Double-click the required editor in the WinCC Explorer.

Using the editors in WinCC Explorer in the PCS 7 environment

WinCC Explorer offers you a variety of editors, some of which you use extensively for OS configuration. Other editors are of no relevance in the PCS 7 environment because the data doesn't have to be configured manually; it is preset by the ES configuration instead. For example, you use the Graphics Designer very regularly, whereas the Text Library would only be used in exceptional situations.

Important editors for configuring the OS in the WinCC Explorer

Here is a brief explanation of the WinCC editors that are used for configuration work.

Editor	Description
Graphics Designer	In the Graphics Designer, you create the process pictures that are displayed for the operator on the operator station and that are used for controlling the process. PCS 7 provides a function for use when creating process pictures that automatically inserts all the block icons into the process picture. Block icons are clear, graphical representations of a PCS 7 block for which operator control and monitoring is enabled. You can insert and dynamize additional graphics objects. A simple example: You can visualize the current state of a valve so that the operator immediately sees whether the valve is "open" or "closed".
Tag Logging	The "Tag Logging" editor is an important tool for archiving measured values. You can change the parameters for the system archive in Tag Logging. You can create new archives individually and assign the process values that you want to archive to these archives. In so doing, you can define a process of archiving that is tailored precisely to your needs. The archived values can also be displayed in process mode.
Picture Tree Manager	In the Picture Tree Manager, you calculate or update the hierarchy of the group displays.
User Administrator	In the "User Administrator" editor, you define higher-level user groups and individual users for which you can define certain rights. You define these rights for the OS areas that you have specified in the plant hierarchy in SIMATIC Manager.

Editor	Description
Block List editor	The Block List editor shows you all blocks that you inserted into CFCs during ES configuration. Requirements: The OS is compiled. You can assign a special picture to a block in the Block List editor. This enables the plant operator to switch directly from the message list to this picture via the "Loop-in-Alarm" function. If you don't assign a special picture, the corresponding faceplate is automatically called in the "Loop-in-Alarm" function.
Process Historian editor	You can select the data you require on the Process Historian. For this function use the “Process Historian” editor in WinCC Explorer. The "Process Historian" editor is available only when the "Process Historian Ready Component" is installed.

Additional help in WinCC Explorer

The *WinCC Information System* online help contains detailed information about the different editors available to you in WinCC Explorer. You can call up the online help from within WinCC Explorer and from any of the individual editors.

7.3 Properties of OS

7.3.1 Overview of properties of the OS

Introduction

You must set specific properties for each individual OS.

Setting	Meaning
Project properties (Page 104)	The settings for the project properties apply to the entire OS.
Computer properties (Page 107)	The settings for the computer properties apply to the OS that you opened from SIMATIC Manager.

7.3.2 Setting the project properties

Cross-project settings

Cross-project settings are made in the project properties:

Tab	Settings / meaning
General information	You can enter the author as well as the project version and a comment. You can change the project type via the "type" selection field.
Update cycle	You use the update cycle to control how often a dynamic display is updated in process mode. This might involve a fill level display, for example. The dialog box presents a selection list of all of the available standard update cycles. • If your project requires other specific update cycles, you can define your own custom update cycles here. • If a display is inserted in the Graphics Designer, you can assign an update cycle to the display.
Operating mode	You specify whether a WinCC project will be operated as a service in WinCC ServiceMode (Page 105). WinCC Runtime can also then be active in ServiceMode if no interactive user is logged onto the computer.
Hotkeys (key combinations)	You can define key combinations for the following functions: • Logon • Logoff • Hard copy These functions are used by plant operators in process mode.

Tab	Settings / meaning
User interface and design	Select the design for the appearance of the interface in process mode: **WinCC 3D** **Note:** The following WinCC designs are not supported by PCS 7: • WinCC Classic • Glass • Simple • WinCC Dark Ensure that all projects in a plant have uniform settings for the design. If you change the setting of the design, check the visualization of user-created objects and adapt these if necessary.
Options	You can enable the activation of Runtime for a project on the ES. To do this, select the "Allow activation on ES" check box. You specify whether the online help can be called up in Runtime.

Additional information

- Online help *WinCC Information System*.

7.3.3 WinCC ServiceMode

The WinCC service mode is released in connection with PCS 7 OS for the following configurations:

- PCS 7 OS Server
- PCS 7 Maintenance Station
- PCS 7 OS Server combined with PCS 7 Maintenance Station

7.3.4 How to define a user cycle

Procedure

1. In the tree view of WinCC Explorer, select the object "OS [Name of OS in SIMATIC Manager]".
2. Select the menu command **Edit > Properties**.
   The "Project Properties" dialog box opens.
3. Select the "Update Cycles" tab.
4. Select a user cycle.
5. Enter the required name in the input field.
6. Enter the required update time in the input field.
7. Click "OK".

Additional information

- Online help for *WinCC Information System*

7.3.5 How to define hotkeys

Procedure

1. In the tree view of WinCC Explorer, select the object "OS [Name of OS in SIMATIC Manager]".
2. Select the menu command **Edit > Properties**.
   The "Project Properties" dialog box opens.
3. Open the "Shortcuts" tab.
4. Select an action from the "Actions" list.
5. In the "Previously assigned to" text field, enter the key combination you want to use to perform this action in process mode.
   This new key combination is displayed.
6. Click "Assign".
   The key combination is applied.
7. Click "OK".

Additional information

- Online help for *WinCC Information System*

7.3.6 How to define the global design

Procedure

1. In the tree view of WinCC Explorer, select the object "OS [Name of OS in SIMATIC Manager]".
2. Select the menu command **Edit > Properties**.
   The "Project Properties" dialog box opens.
3. Open the "User Interface and Design" tab.

4. The currently selected style is displayed in the "Active Design" area. If the currently selected design does not show "WinCC 3D", click "Edit". You can find additional information on the design in section "Setting the project properties (Page 104)".

   Note

   Note the following:

   - Ensure that all projects in a plant have uniform settings for the design. If you change the setting for the WinCC design, check the appearance of user-created objects and adapt them if necessary.
   - Retain the setting if you update the software. During a software update, changing the setting for the appearance of the user interface in process mode could cause considerable changes.

5. If you want to make changes to the "Central Color Palette", click "Edit".
6. Click "OK".

Additional information

- Online help *WinCC Information System*

7.3.7 Setting the computer properties

Introduction

Computer properties are used to define specific properties for an OS that are important for process mode.

You make the computer property settings in various tabs in the "Computer properties" dialog box. The settings depend on the project status: The configuration in the engineering phase may differ compared to the settings for process mode.

Name of OS – "General" tab

Do not make any settings in the "General" tab. The type and name of the computer are automatically entered. The name of the computer corresponds to the name of the engineering station that you use for configuration and is identical to this computer's name in the network. The name is stored under "System Properties" in the Windows Control Panel. This name is automatically replaced with the name of the target computer when the project is downloaded to the target computer.

Starting applications – "Startup" tab

Use the "Startup" tab to activate the applications required in process mode that are to be automatically started when the OS is started. The settings are usually entered automatically on the "Startup" tab in the PCS 7 environment.

Only activate the applications that are actually required for process mode. This will limit the load on the computer to the required amount. For example, if you use tag logging during process control, you need to activate this application. You can deactivate the "Graphics Runtime" application for OS servers that do not use the operator control and monitoring function.

You can find additional information about this in the online help for *WinCC Information System*.

Language setting and shortcut keys – "Parameters" tab

The "Parameters" tab allows you to disable certain common Windows shortcut keys. This prevents the operator in process mode from starting additional software applications that could adversely affect the performance of the OS. You make different settings on this depending on the configuration phase:

Configuration phase	Setting
If you have not started the configuration phase:	Select the software language. You can find information about this in section "How to set languages in WinCC Explorer (Page 38)".
If you are still in the configuration phase:	Do not make any settings in this tab.
When the project goes into actual operation:	Disable all Windows shortcut keys that the operator is not allowed to use. Only make this setting once the configuration is complete.

You can find additional information about this in the online help for *WinCC Information System*.

Window and key settings in process mode – "Graphics-Runtime" tab

On the "Graphics Runtime" tab you can define all settings that are to apply to the display in process mode. You generally do not have to make any settings on this tab.

You can make additional settings for the display in the "OS Project Editor".

As long as you are in test mode, you can, for example, activate the window attributes "Maximize" and "Minimize". This allows you to quickly change from the runtime view to other applications when running the system in test mode.

Note

Be sure to clear these settings when the project goes into actual operation.

Settings for process mode – "Runtime" tab

You define the settings for process mode on the "Runtime" tab:

- If you are using VB scripts: Settings for a VBS debugger in process mode
- Definition of a cache for process pictures
- Appearance of the mouse pointer during certain actions of the operator

7.3.8 How to work in the "Computer properties" dialog box

Procedure

1. Select the "Computer" object in the tree view of WinCC Explorer and select the menu command **Edit > Properties**.
   The "Properties – Computer list" dialog opens. In the PCS 7 environment you are shown exactly the computer that you selected in SIMATIC Manager and from which you opened WinCC Explorer.
2. Select the computer and click "Properties".
   The "Computer properties" dialog box opens.
3. If you want to change the default settings, switch to the desired tab and make your settings.

   Note

   Usually, you do not have to make any settings on the "General" and "Startup" tabs.

4. Click "OK".

Additional information

- Online help *WinCC Information System*.

7.4 Working with the OS Project Editor

7.4.1 Overview of OS Project Editor

OS Project Editor

In the OS Project Editor, you make the settings for the user interface that the operator will use for operator control and monitoring of the plant in process mode. Following compilation of the OS, the data you have already created in SIMATIC Manager will be transferred automatically.

If you require specific settings for process mode, you can change the default settings and conveniently transfer them to another OS using the Import/Export function in the "General" tab.

You open the OS Project Editor in WinCC Explorer

Opening the OS Project Editor

1. In the WinCC Explorer tree view, select the OS Project Editor.
2. Open the shortcut menu and select the menu command **Open**.

Introduction to the OS Project Editor

The OS Project Editor provides the following tabs:

Tab	Function
Layout	Monitor configuration and definition of buttons in order to allow operators to change between OS areas and OS servers
Message configuration	Definition of the representation of messages in process mode. This tab is only active if the "Complete configuration (loading online changes no longer possible)" option button or the "Only message configuration (loading online changes no longer possible)" option button is activated in the "General" tab. You can specify the following here • Obligation to acknowledge all messages of the "tolerance" message class • Message priority for OS process control messages The definition of the priorities corresponds to the priorities that you use in SIMATIC Manager. You can find additional information about this in section "Message priorities (Page 88)".

Tab	Function
Message display	Settings for the following messages displays: • Message filter • Extended message line • Authorization check of messages without area entry • Manual hiding of messages (Smart Alarm Hiding) • Sorting of message pages • Creating the group display hierarchy • Block comments of operator input messages Assignment of messages without specific area assignment: Process control messages are not assigned to a specific OS area, for example. You can select an OS area from the drop down list box to automatically assign these messages to this area in process mode. You have to make this setting individually for each OS client.
Areas	• Definition of the OS areas a plant operator can call in the overview area • Definition of the picture selection for OS areas if user rights are missing. – Picture selection not possible: The operator is denied access to the area pictures (default behavior, as in PCS 7 V6.1 SP1). – Picture selection for protected areas possible with area selection buttons: Operators can use these buttons to access the area pictures. Access by way of group displays in the overview area and in Picture Tree Navigator is not allowed. Area-specific messages are hidden. Process controls are not possible in PCS 7 faceplates. Operator inputs in the process pictures depend on configured operator authorization levels. – Picture selection for protected areas possible with area selection buttons and group displays: Operators can use the area selection buttons, the group displays in the overview area and Picture Tree Navigator to access the area pictures. Area-specific messages are hidden. Process controls are not possible in PCS 7 faceplates. Operator inputs in the process pictures depend on configured operator authorization levels. You can find additional information about this in the online help for *WinCC Information System.*
Runtime window	• Definition of the maximum number of windows that can be opened when calling faceplates and trend displays. • Definition of the maximum number of faceplates that can be opened on a monitor. The last faceplate opened is closed automatically when you open the next faceplate after the maximum number is reached.

Tab	Function
Basic data	Definition whether to restore the factory state of the object. The list includes all project objects which were changed after initialization of the basic data. You can select the following objects: • Pictures • Faceplates • Scripts • Color areas of APL faceplates If you have customized the color areas of the faceplates of the Advanced Process Library in a project-specific manner and do not want to reset them, make sure that the "Update palette colors of Advanced Process Library" check box is cleared. (default setting).
General information	• Settings in the "OS Project Editor" for the "Download changes" function. Note that a complete download operation is required if "Complete configuration" is set. • Settings for the logs created in OS Project Editor • Printing or viewing the project documentation of the current project configuration • Executing the export/import of the current configuration settings in OS Project Editor in order to easily transfer the settings for other operator stations in the project

When using the "User-configurable message classes" function, observe the information in section "Configuring the PCS 7 message system" in manual "PCS 7 Engineering System".

Working with the OS Project Editor

An asterisk is displayed next to the tab name to indicate that changes were made in a tab. WinCC deploys this function to indicate that changes were made in the tab and have not been saved yet.

When you open the OS Project Editor the first time, the default settings that were automatically applied during ES configuration are displayed. The "Basic data" tab, however, forms an exception: The list entries change automatically, depending on the picture and script configuration on the OS.

Additional information

- Online Help of the tabs

7.4.2 How to activate or deactivate individual process control messages and operator input messages of the OS

Introduction

The default process control messages and operator input messages for the OS are available in the OS Project Editor for archiving. The following steps show how to adapt the preset message configuration in the OS Project Editor for your specific system.

Procedure

1. In the WinCC Explorer tree view, select the OS Project Editor.
2. Open the shortcut menu and select the **Open** command.
   The OS project editor opens.
3. Select the "General" tab.
4. Activate the "Message configuration only" option button.

   Note

   Do not activate the "Complete configuration" option button.

5. Select the "Message configuration" tab.
6. Select or clear the check boxes of the desired messages.
7. Click "OK".

Additional information

- Online Help for *WinCC Information System*

7.5 Working with the Process Historian Editor

7.5.1 How to select the data for Process Historian

Note

Selection of data for Process Historian only

This settings are only for a specific selection of data for Process Historian required.

You can select the data you require on the Process Historian. For this function use the “Process Historian” editor in WinCC Explorer.

All the following options are selected by default:

- Tag runtime data
- Common messages
- System messages
- Operator messages

Requirements

“Process Historian Ready Component” is installed on Engineering Station.

Note

The "Process Historian" editor is available only when the "Process Historian Ready Component" is installed.

You must choose in the setup of PCS 7 the user specific installation for getting the "Process Historian Ready Component" installed.

Procedure

1. Open WinCC Explorer.
2. Open "Process Historian" editor in the tree structure.
3. Select "Filter" tab.
4. Check the required data to be transfered and activate the required options.

After the configuration, OS data has to be transfered to OS server.

Setting user rights 8

8.1 Overview of user rights

User rights in process mode

User rights are important in process mode. You use them to control which plant operators are permitted to use which functions in process mode. User rights for message acknowledgment and process control input are not granted to all operators, for example.

Note

To ensure that an operator can acknowledge only the messages belonging to his OS area, you must make an additional setting in the OS Project Editor.

You can find additional information about this in section "How to make settings for the alarm system in the OS Project Editor (Page 223)".

When plant operators log on in process mode with their logon name and password for operator control and monitoring of the process, their assigned user rights are checked. Based on the user rights, only the plants areas and functions that correspond with the assigned authorizations are enabled.

"User Administrator" Editor

User rights are administered in the "User Administrator" editor of WinCC Explorer. In the "User Administrator" editor, you specify users and user groups and assign them the desired authorizations.

You can find additional information about the "User Administrator" editor and user rights in the online help for *WinCC Information System*.

Setting the behavior in response to missing user rights

You make specifications for picture selection for OS areas with missing user rights in the OS Project Editor.

You can find additional information about this in section "Overview of OS Project Editor (Page 110)" and in the online help for *WinCC Information System*.

User rights for Web applications

When you use a PCS 7 Web client/PCS 7 Web Diagnostics client that provides the plant operator with operator control and monitoring functions via the Internet or an intranet, you must set up corresponding user rights as well as special settings for Web access. In PCS 7 V9.0 "audible alarm indication" function is available.

You can find detailed information on the use of PCS 7 Web client/PCS 7 Web diagnostics client and PCS 7 Web server/PCS 7 Web diagnostics server in manual *Process Control System PCS 7; Web Option for OS*.

User rights for operator control of the faceplates of the Advanced Process Library

Operator input in the views of the APL faceplates depends on certain APL operator authorizations. You can select the operator authorizations in the properties of the block icon:

Operator authorization	Possible operator inputs	Examples of applications
No process control	No operator inputs possible	Operating mode permanently set - cannot be changed
Process controls	• Operator inputs in the standard view of all blocks • Inputs in the ramp and memo views. Exception: The "Out of service" operating mode cannot be used.	• Switch operating mode (manual and automatic) • Change setpoints and manipulated variables • Motor On/Off • Valve Open/Closed
Higher process controls	• Only operator inputs of operator authorization level "Higher process controls". • Operator control of the "out of service" operating mode	Changing values, for example: • Limits • Controller parameters • Monitoring times
Highest process controls	• Operation of the operator station • Activation and deactivation of simulation in parameter view • Enable process tag for maintenance purposes	• Simulation of process values • Enable process tag for maintenance
Extended operation 1	Free project-specific operator authorization	The function can be used for "fine-grained operator authorization".
Extended operation 2	Free project-specific operator authorization	The function can be used for "fine-grained operator authorization".

Instance-specific operator authorization levels

Each operator input is assigned to an operator authorization level in the faceplates.

This fixed assignment can be changed instance-specific for AS blocks in the CFC editor. You make the setting in the "Operator authorization level" attribute of the properties for the I/Os of the AS block (for example, SP_Int for the PIDConL block). The following assignment applies:

Table 8-1 Setting the operator authorization level

Setting in the user administration	Setting in the CFC
No process control, monitoring only	0
Process controls	1
Higher process controls	2
Highest process controls	3

Setting in the user administration	Setting in the CFC
Extended operation 1	4
Extended operation 2	5

You can find additional information on the operator authorizations of the APL faceplates in the manual *Process Control System PCS 7; Advanced Process Library*.

8.2 User rights per OS area

Plant hierarchy and user rights

You have already defined the structure of your plant with all of its components, for example, plants, units, CFC charts or pictures, in the plant hierarchy in SIMATIC Manager. This plant hierarchy also serves as the basis for the defining the OS areas for which you specify user rights, so that certain users or user groups only have access to particular OS areas. The user can select the pictures from OS areas for which he has no authorization.

Picture Tree Manager

There is a correlation between the Picture Tree Manager and the OS areas that are available to you in the User Administrator: The second hierarchy level in the Picture Tree Manager is made available to you in the User Administrator as OS areas for which you can set user rights.

Note

Avoid making subsequent modifications in the Picture Tree Manager. Subsequent modifications result in differences between your project data in SIMATIC Manager and the project data in WinCC Explorer.

Moreover, manual modifications of the plant structure can be overwritten or may not be updated when the OS is recompiled.

8.3 Setting of user rights

8.3.1 User groups and user rights

Introduction

Certain functions in WinCC require particular user permissions to make configuration settings or for operator control and monitoring in process mode.

You have the following options:

- Creating user groups
  You can create up to 128 user groups.
- Creating individual users
  You can create up to 128 users.

Settings in the "User Administrator" editor

The different OS areas from the plant structure from SIMATIC Manager are shown in the User Administrator. A maximum of 256 OS areas are supported. The meanings of the settings are as follows:

Check box	Meaning
Cleared	No authorization
Selected	Authorization for the corresponding OS area
Colored back-ground	Authorization is automatically granted by setting the higher-level authorization "Enable".

The "Enable" column is a higher-level setting for all OS areas. If you select the check box of a function in this column by double-clicking it, all other OS areas are also automatically selected.

User group

You can create different user groups and assign certain user permissions for them. You can only assign a group name once. You can create individual users within a user group. Authorization level 1 "User administration" is the default for the users in the "Administrator" group. You cannot delete this level.

If you define user permissions, first of all plan which basic user rights you need for your project. Then create user groups with the corresponding rights for these different user rights. You create individual users in a subsequent step.

Users

You can assign each user specific rights. Assign each of the users to a user group for greater clarity. If you create a user within a user group, you can then simply apply the settings for that user group. This means that you will only have to specify the user's special rights.

Create a login and a password for each user.

User rights

There are two options available in the "User Administrator" editor for assigning rights:

- WinCC logon
  Create user groups/users and assign rights
- SIMATIC logon,
  selection of the "SIMATIC Logon" checkbox:
  Create user groups and assign rights

You can find additional information about this in the online help:

- Online help for *WinCC Information System*
- Online help for *SIMATIC Logon*

8.3.2 How to set up user rights

The basic procedure for setting user rights is presented below. You can find additional information in the online help for *WinCC Information System*.

Requirement

The "Compile OS" function has been executed, so that all plants and units that you created in the plant hierarchy in SIMATIC Manager are available.

Procedure

1. In the WinCC Explorer tree view, select the "User Administrator" editor.
2. Select the **Open** command from the shortcut menu.
   The "User Administrator – WinCC Configuration Studio" window opens.
3. Select the "User Administrator" hierarchy folder in the tree view.
4. If you want to assign authorization levels in addition to the pre-defined authorization levels, create them in the "Authorization" tab.
5. To create groups, switch in the detail area to the "Groups" tab.
6. Enter the name of the group in the "Group name" column.
7. Select the name of the group in the "Group name" column.
8. Set the properties for the groups.
   The properties are used as defaults when creating users in this group.
9. Select the hierarchy folder [name of group] in the tree view.
10. To set authorizations for the group, switch in the detail area to the "Authorization" tab.
11. Enable the desired properties for the group.
    The authorizations are used as defaults when creating individual users in this user group.
12. To create users for the group, switch in the detail area to the "User" tab.
13. Enter the name of the user in the "User name" column.

14. Select the name of the user in the "User name" column.
15. Set the properties for the user.
16. To set authorizations for the user, switch in the detail area to the "Authorization" tab.
17. Activate the desired authorizations that are to apply only to this user.
18. Select the menu command **File > Exit**.

Additional information

Additional information about the settings in the "User Administrator" editor can be found in the online help for *WinCC Information System*.

8.4 User rights in the various editors

You can set special permissions in the following WinCC editors:

- "Tag Logging" editor
- "Graphics Designer" editor for user objects or controls, for example, WinCC AlarmControl or WinCC OnlineTrendControl.

Requirement

The required user groups and users have been created in the "User Administrator" editor.

Tag Logging

You can create and define specific properties for various archives in the "Tag Logging" editor. In the "Properties [Name of Archive]" dialog box, you can set authorizations for read and write access to this archive.

You can find additional information about this in section "Additional archives in the "Tag Logging" editor (Page 255)".

Graphics Designer

User rights have the following effect in the Graphics Designer:

- User objects: The "Authorization" attribute is defined in the object properties.
- AlarmControl: A toolbar with a range of buttons appears in AlarmControl in process mode. The plant operator can perform various functions using these buttons. You can define user rights for each of the buttons in the object properties.
- OnlineTrendControl: OnlineTrendControl gives the operator a variety of options for operator control. You can define authorizations in the object properties.
- etc.

8.5 Using a smart card

8.5.1 Smart card

Introduction

The smart card for user authorization expands the functionality of the User Administrator.

Functionality of a smart card in process mode

In process mode, the plant operator inserts the smart card into the reader, which automatically logs him into the system with the user authorization that is stored on the smart card.

The functionality of the smart card reader can be used together with functionality of the logon with user name and password in an operator station.

Using smart cards

- You can use the smart card in conjunction with the WinCC User Administrator (Page 123) (without SIMATIC Logon).
- You can use the smart card in conjunction with the SIMATIC Logon (Page 124) service.

Additional information

- Online help for *WinCC Information System*
- Online help *SIMATIC Logon*

8.5.2 How to write a smart card with the WinCC User Administrator (without SIMATIC Logon)

Introduction

The following shows you the basic procedure for writing a smart card with the WinCC User Administrator.

Requirements

- Read and write-capable smart card readers
  The smart card reader is connected to a USB port.
  You can find information about the type of smart card reader in the documentation *Process Control System SIMATIC PCS 7; Catalog ST PCS 7*

- The smart card reader interface has been configured.
  - Double-click "WinCC Chipcard Terminal" icon in the Control Panel of the operating system.
    Windows administrator rights are required for the configuration dialog.
  - In the "WinCC Chip Card Terminal Configuration" dialog box, activate the "Terminal active" option.
  - From the "Connection" drop down list box, select the required interface and then click "OK". Your settings are applied.
- There is a smart card in the smart card reader.

Smart cards

Driver	Additional information
Smart card reader	*WinCC Information System* ; Logon via SIMATIC Logon: • Driver for "OMNIKEY CardMan 3121 USB" : CardMan3x21x86_1_1_2_4.exe"

Procedure

1. Select **WinCC Chipcard Terminal** in the Windows Control Panel.
   This activates the smart card function.
   The corresponding menu command is activated in the WinCC "User Administrator" editor.
2. Open the WinCC "User Administrator" editor.
3. Select the menu command **Chip Card > Write to Chip Card** command
4. Select the relevant user from the drop down list box.
5. Start the write operation. Select "Write card".
   The user administrator transfers the data to the smart card.

Additional information

- Online help for *WinCC Information System*

8.5.3 How to write a chip card with SIMATIC Logon

Introduction

The following shows you the basic procedure for writing a smart card with the SIMATIC Logon service.

Requirements

- Read and write-capable smart card reader
  The smart card reader is connected to a USB port.
  You can find information about the type of smart card reader in the documentation *Process Control System SIMATIC PCS 7; Catalog ST PCS 7*
- The SIMATIC Logon service is installed.
- The interface of the smart card reader has been configured in the SIMATIC Logon.
  - Open "**Configure SIMATIC Logon**" using the search box in the start menu.
    The "Configure SIMATIC Logon" dialog box is opened.
  - Configure the smart card reader in the "Logon device" tab.
- The user name and password are set up on a single PC (logon computer) or centrally in Windows (domain).
- There is a smart card in the smart card reader.

Procedure

1. Open "**SIMATIC Logon**" using the search box in the start menu.
2. Select the menu command **Edit Smart Card**.
   The "SIMATIC Logon Service - Edit Smart Card" dialog box opens.
3. Go to the "Log on to:" drop-down list and select:
   - Logon station (for workgroups, for example)
   - Domain
4. Enter the user in the "User name:" text field.
5. Enter the password in the "Password:" text field.
6. Enter the password in the "Confirm new password:" text field.
7. Click "Write data to smart card".
   The "SIMATIC Logon Service – Smart card reader" dialog box opens.
8. Click "OK".

Additional information

- Online help of *SIMATIC Logon*

8.6 Local operator permission

Overview

The local operator permission function can be used to disable or enable operator input on up to 16 operator stations (OS clients).

The enabling and disabling of operator inputs affects all parameter inputs of a block in the AS that are performed in the views of the given faceplate.

Local operator permission is a higher-level operator authorization.

It is determined before the following operator authorizations:

- Authorizations for parameter changes, which are assigned for the block (OS_Perm parameter) in the AS
- Authorizations resulting from the block logic
- Authorizations resulting from the controller logic
- Authorizations that are assigned to the user in the User Administrator

Local operator permission can be configured individually for each instance or for block groups.

Note

Local operator permission can only be configured for blocks of the Advanced Process Library (APL) block library.

Additional information

- Manual *Process Control System PCS 7; Advanced Process Library*

Creating process pictures - Basics 9

9.1 Process pictures on the OS

Process pictures

You can visualize the entire plant or a plant unit using process pictures, thereby enabling plant operators to use these process pictures for operator control and monitoring of the process.

Using the process pictures, the plant operator can see the exact status of the plant, for example, whether a valve is open or closed or the fill level in a tank. The plant operator can also control the process directly via the process pictures.

Requirements for configuring process pictures

In order to start configuring the process pictures, the following preparations must be made in the plant hierarchy:

- The process pictures must be inserted in the plant hierarchy.
- The AS-OS assignment must be complete.
- If desired: The block icons are created.
- The OS is compiled.

Note

Always create the process pictures first in the plant hierarchy in SIMATIC Manager, rather than directly in the Graphics Designer. This is the only way to prevent inconsistencies between the configuration data in SIMATIC Manager and the Graphics Designer.

You can only manage the pictures exclusively in the Graphics Designer if they are not directly related to the plant hierarchy. These include pictures that you need for configuring status displays.

Make sure that the length of a picture name does not exceed 24 characters.

9.2 Overview of the Graphics Designer.

Introduction

The Graphics Designer is an editor in WinCC Explorer. The Graphics Designer provides you with various objects for creating your own graphics. With the supplied libraries, the Graphics Designer also offers a large selection of ready-made graphical elements such as piping and valves. You can change or supplement these elements and place them in your own project libraries for use at any time.

The process pictures created in the Graphics Designer are located in the following default directory:

[STEP 7]\[S7proj]\[name of the project folder]\[wincproj]\[name of the OS]\GraCS

NOTICE
Creating process pictures outside the plant hierarchy If you create process pictures outside the plant hierarchy in the Graphics Designer, the plant operator can call up these pictures and work with them in process mode using the "Picture by name" function without an authorization check. Therefore, configure special authorizations for these pictures.

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

9.3 Objects in the Graphics Designer

Static and dynamic objects

You will find different types of objects in the Graphics Designer, whereby there is a fundamental differentiation between static and dynamic objects. The standard library for WinCC offers a large number of ready-made objects for use when creating process pictures.

Object	Meaning
Static object	A static object is only a drawing object, for example a line, circle, polygon or static text If you have experience working with drawing software, you will know how to work with these objects. You can find additional information about this in the online help for *WinCC Information System*.
Dynamic object	A dynamic object is made dynamic via a connection to a tag or via certain functions. You can always display the current values of the process during runtime. Input/output fields or status displays are examples of dynamic standard objects.

9.4 Types of dynamization

Dynamization options

You have various options for dynamizing objects that you insert in a process picture:

Option	Description
Tag connection	Tag connection is the simplest type of dynamization: You connect an object to an I/O, for example, of a block instance in a CFC. The current value of this I/O is always shown in process mode.
Dynamic dialog box	You formulate the dynamization using tags, functions and arithmetic operations in an expression. You can define specific value ranges. You can find additional information about this in the online help for *WinCC Information System* , topic "Dynamization of an Action".
Direct link	A connection is established between objects. You assign parameters only for the source object and connect this source object to the target object. You can find further information about the function and configuration of direct connections in the *WinCC Information System* Online Help.
C action	A C action is created by linking an event, such as a change in a binary tag, to a function that you program in ANSI C. This function is started by an event or cyclically. A C action is normally linked directly to an object property which is also influenced by the action. For example, a C action can be used to set the color of an analog value depending on a tag. A configured action may have local (project-wide) or global (computer-wide) validity. You can find additional information about C actions in the online help for *WinCC Information System*.
VBS action	A VBS action is created by linking an event, such as a change in a binary tag, to a function that you program in Visual Basic. This function is started by an event or cyclically. A VBS action is normally linked directly to an object property which is also influenced by the action. For example, a VBS action can be used to set the color of an analog value depending on a tag. A configured action always has global (computer-wide) validity. You can find additional information about VBS actions in the online help for *WinCC Information System*.

Note

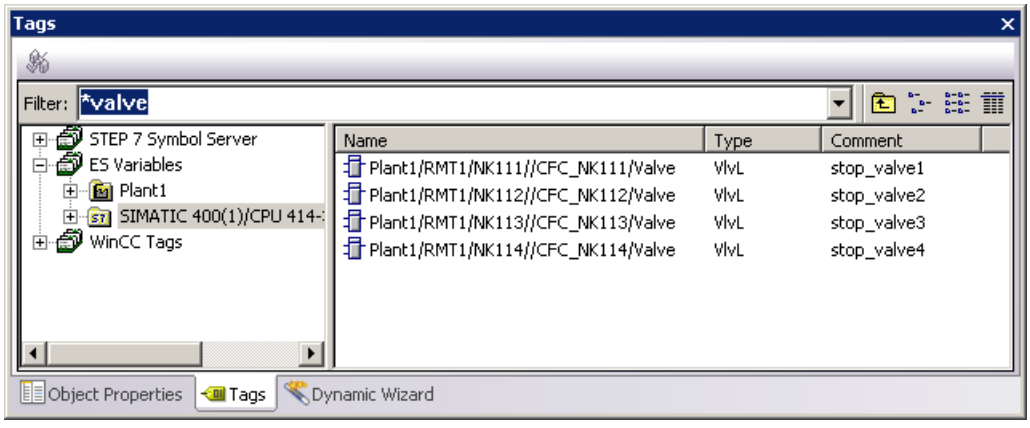
The use of numerous or extensive C actions and/or VBS actions increases the system load which can have a negative influence on picture call-up times in runtime.

Move cyclic computing operations to the automation system and avoid executing them on the OS.

9.5 Tag connection and tag selection dialog box

Tag selection dialog box

Use the tag selection dialog to connect an object to a tag in Graphics Designer. The tag selection dialog can be used to easily make objects from the Graphics Designer dynamic. Tags displayed in this dialog box can originate from SFC charts, SFC instances and block instances in CFC charts.



If you would like the tags to be permanently visible, activate the "Tags" toolbar.

Display of tag management

The tag selection dialog allows you to connect objects, e.g. input/output fields or faceplates, that you insert in a process picture in the Graphics Designer with the corresponding I/O of a block instance in the CFC. In process mode these objects read the current values of the I/O from the AS and display the values on the OS.

In the tag selection dialog box you can find the component view and the plant view from the SIMATIC Manager. The tag selection dialog box shows only the folders from the plant hierarchy that you assigned to the OS in SIMATIC Manager. In the tag selection dialog box, you can also access tags from other projects forming part of the multiproject.

Tag sources

During the configuration process you can choose between two tag sources:

- ES tags:
  These allow you to display all process tags from PCS 7. The process tags originate, for example, from the SFC and CFC charts that you created during the ES configuration. The presentation of ES variables corresponds exactly to the plant hierarchy in SIMATIC Manager. However, you are only shown the plant hierarchy folders that you assigned to the opened OS in SIMATIC Manager. All other folders are hidden. If you connect an object to an ES tag, this tag is automatically transferred to the WinCC tag management, if it is not already present.
- WinCC tags:
  These allow you to display all tags relevant to the PCS 7 OS configuration. Use the filter function to help you find a particular tag.
  You are also shown the tags you created directly in WinCC. You do not normally use this function in the PCS 7 environment, as the tag management is handled centrally via the ES configuration.
  The structure of the WinCC tag name is as follows:

Plant1/	RMT1/	FC111/	Dose	ER	Floating-point number	DB 73	DD 96
PH Level 1	PH Level 2	CFC chart	Block	Element	Data type	DB instance	Address

Filter

You can enter a search condition for the tag name in the "Filter:" text field. When you exit the text field by pressing the Tab key, you are only shown the tags that match the search criterion.

You can find additional information about the tag selection dialog box in the online help for *WinCC Information System*, which you open by clicking "Help".

9.6 Structure and storage of tags in WinCC

Managing the tag management

Open the "Tag Management" editor in WinCC Explorer. In this editor, you manage the following objects:

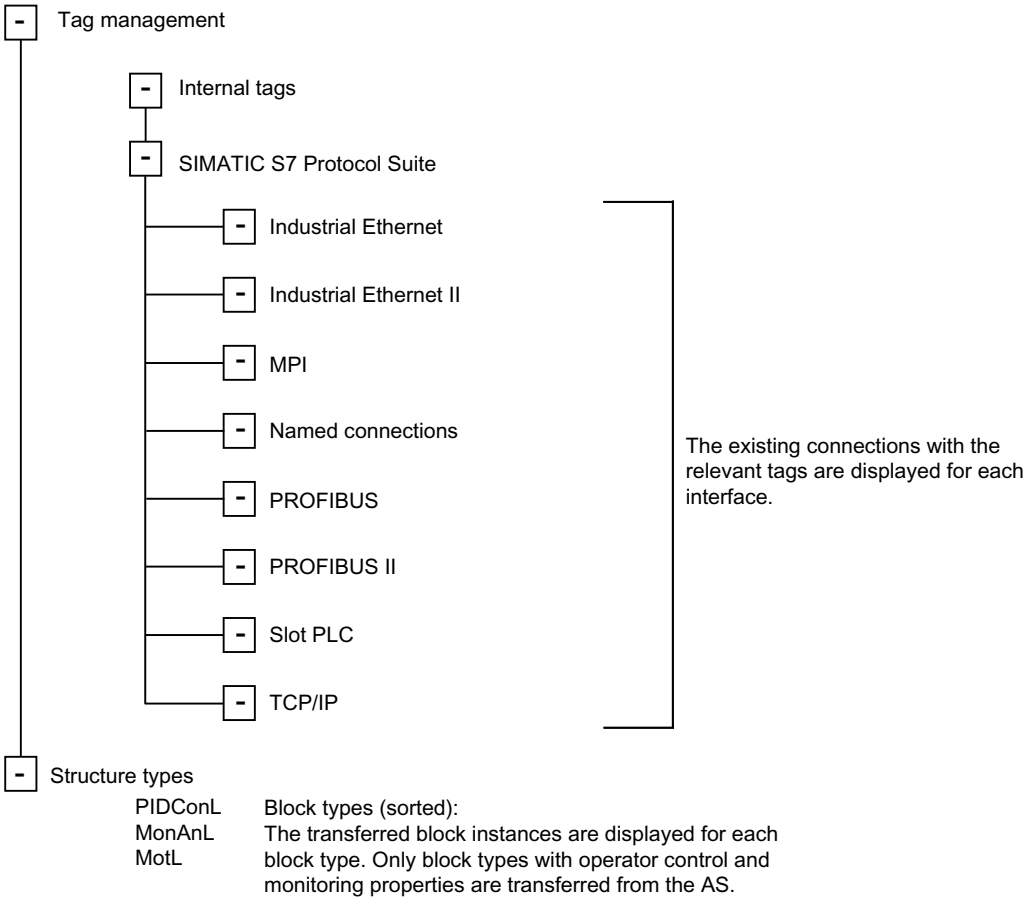
- Channels
- Logical connections
- Process tags
- Internal tags
- Tag groups

You can open the "Tag Management" editor by double-clicking in the tree view of the WinCC Explorer.

Tags from SIMATIC Manager are stored in the tag management.

PCS 7 and tags in WinCC

The tags are displayed according to the settings you defined for OS compilation: The individual S7 programs are displayed with their associated interconnections. If you select an S7 program in the navigation tree, all tags are displayed in the detail window.



9.7 Tag name

Length of tag name

The tag name length is limited to 128 characters.

Note

Please remember that the server prefix (symbolic computer name) counts as part of the tag name length. The server prefix indicates the OS server that is the source of the tag. The server prefix precedes the tag name.

Components of the tag name

The tag name consists of the server prefix, two separators and the higher level designation (HID).
For example: [server prefix]::[HID]

- You assign the server prefix in SIMATIC Manager ("PC station properties > Computer name").
- The HID (Page 56) comprises the name of the folder in the hierarchy path, the chart name and the block name. The separators within the HID must be included.
  For instance, SERVER01::SUBSYSTEM1/MOTOR1

  Note

  Remember, however, that many of the text fields on the OS can not display 128 characters in their entirety.

Additional information

You can find additional information about the length of the tag name in manual *Process Control System PCS 7; Engineering System*, section "Rules for naming in the PH".

9.8 Dynamic PCS 7 standard objects

Introduction

The Graphics Designer provides you with a number of ready-made dynamic objects, which you can use to create process pictures. The standard objects can be found in the object palette of the Graphics Designer under "Smart objects".

Overview of dynamic PCS 7 standard objects

The primary objects are introduced briefly below:

Object	Function
I/O fields	I/O fields function as follows: • They display current process values. • The plant operator can enter values directly during runtime. You can use this field as follows: • As an input field • As an output field • As a combined input/output field
Status display	You can use a status display to show any number of binary states of an object, such as the states of a valve: "open" or "closed".
Bar	You can use a bar display to show values in relation to one another, for example, how the current value relates to an upper and lower tolerance.
Control	You can use a control, for example, to plot the history of the particular measured values, which the plant operator can view in process mode.
Picture window	Picture windows form a type of container in a process picture that can incorporate an additional picture. The incorporated picture is a standard picture that you have created for a particular block type and can be used multiple times. You make a specific tag connection only after you insert this picture in the picture window.
Group display	You have created a hierarchy corresponding to your plant structure. Even in a process picture that only displays a general overview of an entire plant, the plant operator requires information from the process tags located in pictures from lower hierarchy levels. You can map this information by means of group display: The group display outputs states in color code, for example, and alarm.
Extended status display Extended analog display	The advantage of extended status displays compared to normal status displays is that you can also integrate a group display. This enables you to simultaneously display an alarm state and an operating state. You can display both binary and analog values using the two different types of status displays.

Additional information

You can find information about the individual objects in the online help for *WinCC Information System*, section "Smart objects".

9.9 Dynamic, custom objects

Introduction

In addition to standard objects, you can also create objects yourself. You can combine a large number of individual steps into a few steps when you create objects.

Overview of dynamic, custom objects

The following describes the most important objects that you can create yourself:

Object	Function
Faceplate (Page 174)	A faceplate is a dynamized object that represents a certain block type. Through the connection to a structure tag, all tags contained in a faceplate are automatically connected to the associated block parameters and made dynamic.
Block icons (Page 175)	A plant operator can call up a faceplate via a block icon. A block icon is created as a user object. A block icon can be composed from a number of dynamic objects, in order to give the plant operator an overview of the most important information. An additional script enables the plant operator to call up the corresponding faceplate at the click of a mouse.
User object (Page 190)	You create a user object by compiling individual objects. The advantage of a user object is that you can select only the properties you actually need for connection to tags out of the many properties that each object "brings".
User object templates (Page 198)	You can create user object templates on the basis of a user object. The advantage of user object templates is that you can make changes centrally to the user object template, and all the instances are then updated accordingly at once.

9.10 Configuring dynamic objects

9.10.1 Overview of configuration steps for dynamic objects

Overview of the configuration steps

An overview of the basic mode of operation with dynamic objects is given below.

When using the "User-configurable message classes" function, observe the information in the section "Configuring the PCS 7 message system" in the "PCS 7 Engineering System" manual

You must perform the following configuration tasks in the exact order given:

Step	Action
1	Opening the process picture in the Graphics Designer (Page 138)
2	Inserting the dynamic object (Page 139)
3	Configuring the dynamic object (Page 139)
4	Specifying the object properties (Page 139)

Additional information

- Online help for *WinCC Information System*

9.10.2 How to open a picture in the Graphics Designer

Procedure

You can open a process picture from SIMATIC Manager or WinCC Explorer.

If …	… then
You are in SIMATIC Manager…	1. Open the plant view. 2. In the detail view, select the picture you want to edit in the Graphics Designer. 3. Select the menu command **Edit > Open Object**. This opens WinCC Explorer; the picture is then opened in Graphics Designer.
You are in WinCC Explorer...	1. Select the "Graphics Designer" object in the tree view. All available pictures are displayed in the detail window. 2. Double-click the required picture in the detail view. The picture is opened in the Graphics Designer.

9.10.3 How to insert a dynamic object

Procedure

1. Open a picture in the Graphics Designer.
2. If the "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**.
   – In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.
3. In the "Standard" dialog box, select the desired object in the tree view in the "Smart Objects" folder.
4. Move the mouse pointer to the drawing area.
   The mouse pointer changes according to the selected object.
5. Hold down the mouse button and drag open a rectangle large enough to accommodate your object.

9.10.4 How to specify the object properties

Procedure

1. Open the process picture in the Graphics Designer and select the object on the drawing area.
2. Select **Properties** from the shortcut menu for the object.
   The "Object Properties" dialog box opens.
3. Select the "Properties" tab in order to define the settings for the appearance and layout of the object.
4. Select the "Event" tab to configure a change in the object in response to a particular event, e.g. in the event of a mouse click.
5. Click the title bar and select the command **Close** in the shortcut menu.

9.10.5 How to configure a dynamic object

Introduction

If you insert a dynamic object, the configuration dialog is then opened automatically. You can open the configuration dialog again at any time and change the configuration settings.

Setting parameters in the configuration dialog

Depending on the type of dynamic object you inserted in step 2, a corresponding dialog box opens. You set the desired parameters in this dialog box.

If you inserted the following object…	… then
Application window	The "Window content" dialog box opens Select what is to be displayed in the application window.
Picture window	No additional dialog box opens.
Control	The "Insert control" dialog box opens. Select the desired control in the list.
OLE object	The "Insert object" Windows dialog box opens. You have two options: • Select the application you want to use to create the OLE object. • Select an existing file.
I/O field	The "I/O field configuration" dialog box opens. Click the button next to the "Tag" text field and select a tag from the tag selection dialog. Also specify the update cycle, the field type and the formatting parameters.
Bar	The "Bar configuration" dialog box opens. Click the button next to the "Tag" text field and select a tag from the tag selection dialog. Also specify the update cycle, the limits and the formatting parameters.
Graphic object	The "Graphic object configuration" dialog box opens. Select the picture that you want to display as a graphic object.
Status display	the "Status Display Configuration" dialog box opens. Click the button next to the "Tag" text field and select a tag from the tag selection dialog. Select a picture and select the update cycle from the drop-down list.
Text list	The "Text List Configuration" dialog box opens. Click the button next to the "Tag" text field and select a tag from the tag selection dialog. Select the update cycle from the drop-down list, the field type and the formatting parameters.
3D bar	No dialog box opens. As a second step, enter the following values in the "Properties" dialog box. • Maximum value • Minimum value • Process connection
Group display	You can find additional information about inserting and configuring a group display in section Overview of group display (Page 159)".
Extended status display	You can find additional information about inserting and configuring an extended status display in section Overview of extended status display (Page 143)".

Click "OK".
The dynamic object is inserted with the corresponding settings.

Reopening the configuration dialog box

If you want to change the configuration settings subsequently, reopen the configuration dialog box.

Proceed as follows:

1. Open the process picture in the Graphics Designer.
2. Open the shortcut menu for the object you want to configure and select the menu command **Configuration dialog…**.
   The configuration dialog box opens.
3. Change the configuration settings.
4. Click "OK".

9.11 Configuring a status display

9.11.1 Configuring a status display

9.11.1.1 Working with a status display

Status display

The status display is used to show the status of an object, e.g. "valve closed" or "value open". However, the status display can display graphics for not only two statuses but practically any number of different statuses.

The display of object statuses is realized via the connection to a tag whose value reflects the current status. You can assign the tag any number from **2** to 2^{32}**-1** (bit combinations).

Various pictures can be assigned to the individual object statuses. The size and the properties adopted by a status display in process mode are defined in the Graphics Designer.

9.11.1.2 How to configure a status display

Introduction

You configure the status display in the Graphics Designer. You can link a status display to PCS 7 standard pictures or custom pictures.

When using the "User-configurable message classes" function, observe the information in the section "Configuring the PCS 7 message system" in the "PCS 7 Engineering System" manual.

Configuring a status display with standard pictures

The following is an overview of the configuration steps:

Step	Action
1	Dragging the "Status display" object from the object palette onto the drawing area
2	In the "Status Display Configuration" dialog box: interconnect the status display with the corresponding tag
3	Moving the standard pictures onto the respective statuses with drag-and-drop

Configuring the status display with custom pictures

The following is an overview of the configuration steps:

Step	Action
1	Creating the pictures for representation of each status and exporting them as an EMF file
2	Dragging the "Status display" object from the object palette onto the drawing area
3	In the "Status Display Configuration" dialog box: Interconnect the status display with the corresponding tag and connect the statuses to the associated pictures

9.11.2 Configuring an extended status display

9.11.2.1 Overview of the extended status display

Extended status display

Compared to the simple status display, the extended status display has the advantage that more statuses can be represented.

Setting parameters and connecting tags

You first set the parameters for the extended status displays in a configuration dialog box.

You then make the tag connection to the associated block instance in the properties dialog box.

Import/export function

Once you have completed the configuration of the status display, you can export the settings to an XML file and, if desired, import the settings into another status display. This function definitely saves you work when you want to use a status display to represent the same block in different ways.

Example: Changing the valve representation

By way of example, the table shows an overview of the steps for changing the representation of a valve:
Example task: Changing a horizontal valve representation to a vertical valve representation.

Step	Action
1	Configuring the status display for the horizontal valve representation: • Define all operating and alarm states. • Assign associated pictures (e.g. EMF files) Note: Read section "How to configure block icons with custom pictures (Page 182)".
2	Exporting the configuration to an XML file.

Step	Action
3	Executing the "Find/Replace" function: replace all instances of the name of the picture that represents the valve in horizontal direction with the name of the picture that represents the valve in vertical direction.
4	Save the XML file with a descriptive name.
5	Import the settings from the modified XML file for the vertical valve representation.

9.11.2.2 Working with the extended status display

When using the "User-configurable message classes" function, observe the information in the section "Configuring the PCS 7 message system" in the "PCS 7 Engineering System" manual.

With the extended status display, you can display the operating states and the associated alarm states for an object on a faceplate.

Defining operating and alarm states

In the extended status display, you can link status information of an AS block to a maximum of four statuses.

In PCS 7, you connect signals that map the alarm states and the operating states with the extended status display. You can logically combine these signals. You assign the pictures that will be displayed in the process picture in process mode to each combination of signal states.

You define different priorities for the selected alarm states and/or deactivate certain alarm states that the block is unable to assume. The alarm priority defines which alarm is displayed first if several alarms are pending simultaneously. The following rule applies during process mode:
Unacknowledged alarms always take priority over acknowledged alarms.

Setting parameters

You make all settings in a configuration dialog box in the Graphics Designer. A number of combinations are possible depending on the binary states and alarm states selected.

Configure the following attributes (Extended status display properties > Miscellaneous):

- Attributes "Status1" ; "Status2" ; "Status3" ; "Status4"
  Recommendation:
  Interconnect the PCS 7 structure tag "Status(x)" with the status attributes for the operating states.
  You can find information about this in section "How to determine the operating states from the status word assignment (Page 145)".
- "Group value" attribute
  Recommendation:
  Interconnect the PCS 7 structure tag "EventState" of the object for the alarm states (e.g. for a valve: ChartName/ObjectName.EventState...).
  You can find information about this in section "Information about the alarm states (Page 146)".

Overview of the configuration steps

Inserting and configuring the extended status display comprises the following steps:

Step	Content
1	Determining the bits for operating states (Page 145)
2	Determining the bits for alarm states (Page 146)
3	Preparing the extended status display (Page 147)
4	Inserting the extended status display (Page 150)
5	Linking the tags (Page 150)
6	Configuring the extended status display (Page 151)
7	Displaying your own pictures in the extended status display (Page 153)

9.11.2.3 How to determine the operating states from the status word assignment

Introduction

When configuring the extended status display, you need the bit numbers of the operating states you want to display.

For the AS blocks, you can find the status word assignment for the structure tag "Status (x)" in the online help for the block.

Information in the online help of the AS block type

You can find the information you need to configure the extended status display in the online help:

Information about the operating states

- You can find the status word assignment for the structure tag "Status(1; 2; 3; 4) in section "Description of [block name]" in the online help
  (for example, "Description of VlvL").
- The operating states are assigned to a status bit of the structure tag "Status(1; 2; 3; 4)".

Procedure

1. Open a CFC chart in SIMATIC Manager.
2. Select the AS block for which you want to insert an extended status display.
3. Press <F1>.
   The online help for the block opens.
4. Determine the needed bits.
   Example:
   Block type VlvL; Status word assignment for the structure tag "Status2"
   Status bit 20: Operating state: 1 = Valve open

9.11.2.4 Information about the alarm states

The alarm states are mapped in the OS via the PCS 7 structure tag "EventState". The bits are assigned to the message classes in the "EventState" tag. The states of the alarms are represented using the status information and the associated acknowledgment information.

- Status information of the PCS 7 tag "EventState" (bit 31 - bit 16)
- Acknowledgment information of the PCS 7 tag "EventState": (bit 15 - bit 0)

The following alarm states can therefore be determined from the "EventState" tag for each message class:

- Incoming (+)
- Incoming and acknowledged (+Q)
- Outgoing and not acknowledged (-)
- OK

Note

"EventState" tag

Select the "WinCC tags" data source for the "EventState" tag in the tag selection dialog box.

PCS 7 tag "EventState"

The individual bits of this tag are interpreted as follows:

Status information of the PCS 7 tag "EventState":

Bit in double word	Message class	Message type
Bit 31 (MS bit)	Alarm	AH
Bit 30	Alarm	AL
Bit 29	Warning	WH
Bit 28	Warning	WL
Bit 27	Tolerance	TH
Bit 26	Tolerance	TL
Bit 25	AS process control message	Fault
Bit 24	AS process control message	Error
Bit 23	Maintenance request	Maintenance request
Bit 22	Process message	PM
Bit 21	Not allocated	Not allocated
Bit 20	Operator request	OR
Bit 19	Operator message	OM
Bit 18	Status message	Status AS
Bit 17	Status message	Status OS
Bit 16	Process tag locked	X

Acknowledgment information of the PCS 7 tag "EventState":

Bit in double word	Message class	Message type
Bit 15	Alarm	AH acknowledged
Bit 14	Alarm	AL acknowledged
Bit 13	Warning	WH acknowledged
Bit 12	Warning	WL acknowledged
Bit 11	Tolerance does not require acknowledgment in PCS 7	TH acknowledged
Bit 10	Tolerance does not require acknowledgment in PCS 7	TL acknowledged
Bit 9	AS process control message	Fault acknowledged
Bit 8	AS process control message	Error acknowledged
Bit 7	Maintenance request	MR acknowledged
Bit 6	Process message	PM acknowledged
Bit 5	Not allocated	Not allocated
Bit 4	Operator request does not require acknowledgment in PCS 7	-
Bit 3	Operator message does not require acknowledgment in PCS 7	-
Bit 2	Status message does not require acknowledgment in PCS 7	-
Bit 1	Status message does not require acknowledgment in PCS 7	-
Bit 0 (LS bit)	Process tag locked does not require acknowledgment in PCS 7	-

9.11.2.5 How to plan the representation of the extended status display

Introduction

The following example shows the planning for an extended status display of a valve. The display of statuses of the VlvL block from the Advanced Process Library is provided in the example.

Example: Planning the extended status display for a valve

The following statuses are to be displayed:

- Symbol when the valve is fully functional.
  - Open state
  - Not open state (accepted here as closed)
- Symbol when an alarm is present and acknowledged.
  - Error
- Symbol with current state and indication when the alarm state has changed.
  - Open flashing
  - Closed flashing

The table shows the statuses and the pictures to be displayed:

Alarm state (EventState; Bit 25)	Operating state (FBOpen-Out_Value)	Basic picture	Flash picture*
No alarm (OK)	Valve not open (FBOpenOut_Value=0)	Gray valve	
Alarm is outgoing (-)		Gray valve	Red valve
Alarm is incoming (-)		Gray valve	Red valve
Alarm is incoming and acknowl-edged (Q+)		Red valve	
No alarm (OK)	Valve open (FBOpenOut_Value=1)	Green valve	
Alarm is outgoing (-)		Green valve	Red valve
Alarm is incoming (-)		Green valve	Red valve
Alarm is incoming and acknowl-edged (Q+)		Red valve	

* If a flash picture is configured, the display changes between the basic picture and flash picture.

Information about the statuses

- The alarm states are mapped in the OS via the PCS 7 structure tag "EventState". You can find information about this in section "Information about the alarm states (Page 146)".
- The operating states are mapped in the OS using the PCS 7 structure tag "Status(x)". You can find information about this in section "How to determine the operating states from the status word assignment (Page 145)".

Procedure

1. Depending on the operating and alarm states, determine the signals with whose help you can uniquely represent the desired statuses.
2. Create a table where you enter the possible statuses of the interconnected attributes. Example: See "Result"
3. Enter the pictures to be displayed in process mode for combinations of statuses in the table.

Result

The table for the example is shown below:

Attributes		Display	
Status1 (FBOpenOut_Value) 2^0=1	Group value (alarm)	Basic picture	Flash picture
0	OK	apl_fp_VlvL_closed_V8.emf	–
0	Bit 25 (S), -	apl_fp_VlvL_closed_V8.emf	apl_fp_VlvL_err_V8.emf
0	Bit 25 (S), +	apl_fp_VlvL_closed_V8.emf	apl_fp_VlvL_err_V8.emf
0	Bit 25 (S), + Q	apl_fp_VlvL_err_V8.emf	–
1	OK	apl_fp_VlvL_opened_V8.emf	-
1	Bit 25 (S), -	apl_fp_VlvL_opened_V8.emf	apl_fp_VlvL_err_V8.emf
1	Bit 25 (S), +	apl_fp_VlvL_opened_V8.emf	apl_fp_VlvL_err_V8.emf
1	Bit 25 (S), + Q	apl_fp_VlvL_err_V8.emf	–

Recommendation:

Create a table in which **all**object states are entered with the associated graphic objects.

The following table shows an extract of the combinations of four status tags and the group value as an example. Plan the displayed pictures only for required combinations.

Index	Bit3 Valve open 2^3=8	Bit2 Valve closed 2^2=4	Bit1 Valve opens 2^1=2	Bit 0 Valve closes 2^0=1	Group value (alarm)	Basic picture	Flash picture
0	0	0	0	0	OK	Pic-ture1_V8.emf	
19	0	0	0	1	Bit 25 (S), -		
... ...							
362	1	1	1	0	Bit 25 (S), +	Pic-ture2_V8.emf	Pic-ture3_V8.emf
364	1	1	1	1	Bit 25 (S), + Q		

Additional information

Online help for *WinCC Information System*

9.11.2.6 How to insert an extended status display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.
3. In the "Standard" dialog box, select the "Status Display (extended)" object in the tree view in the "Smart Objects" folder.
4. Move the mouse pointer to the drawing area.
   The mouse pointer is transformed into a status cursor.
5. Hold down the mouse button and draw a rectangle the size of the extended status display.
   The "Extended status display properties" dialog box opens.

9.11.2.7 How to make a tag connection

Procedure

1. Open the shortcut menu of the extended status display and select the menu command **Properties**.
   The "Object Properties" dialog box opens.
2. Select the "Properties" tab. Define the following settings for the "Miscellaneous" property:
   – "Group value" attribute
     Recommendation:
     Interconnect the structure tag "EventState" of the object for the alarm states (e.g. for a valve: Chart_name/Object_name.EventState etc.).

     Note

     Structure tag "EventState"

     Select the "WinCC tags" data source for the "EventState" structure tag in the tag selection dialog box.

   – Attributes "Status1" ; "Status2" ; "Status3" ; "Status4"
     Recommendation: Interconnect the PCS 7 structure tag "Status(x)" with the status attributes for the operating states.
3. Click the title bar and select the command **Close** in the shortcut menu.

9.11.2.8 How to configure an extended status display

Procedure

1. Open the "Properties of the extended status display" configuration dialog box.
   - If you have just inserted the extended status display, the configuration dialog box will already be open.
   - If you want to change the configuration subsequently, open the shortcut menu for the selected status display and select the menu command **Configuration dialog box.** The "Extended status display properties" dialog box opens.
2. Open the "General" tab.
3. Make the following settings in the "Bit selection for forming the status value" group:
   Select the desired status words from the drop-down list.
   Enter the bit of the status word bit to be used in the associated "Bit No." text field.
   You can find information about this in section "How to determine the operating states from the status word assignment (Page 145)".
4. If you want to display an alarm evaluation in the representation of the status display, select the "Use group value for display" check box.
   The use of this option corresponds to the PCS 7 standard.
5. Make the following settings in the "Evaluation of the group value" group:
   - In the "Used bits" lists, set the bits that you want to use to represent the alarm evaluation. You can find additional information about this in section "Information about the alarm states (Page 146)".
     The default assignment corresponds to the PCS 7 standard. Use the arrow keys to move a selected bit between the two lists.
   - Set the order of the priorities of the utilized bits for the evaluation of the group value.

     Note

     Setting the priority

     The entries in the "Used bits" list indicate the order of priorities. The top entry has the highest priority (priority 1).
     - Select an entry in the "Used bits" list.
       Change the priority by clicking the "Priority higher" button or "Priority lower" button.
     - All entries in the list of "Unused bits" have the priority "0". The symbols in the "Used bits" and "Unused bits" lists always show the PCS 7 standard, regardless of any project-specific deviation.
6. Open the "Assign pictures" tab.
7. In the index list, click on the state to which you want to assign pictures. The file selection list displays graphic files.
   In the "Assign pictures" tab, assign the used bit combinations to the desired pictures.

8. In the index list, click on the state to which you want to assign pictures.
   The file selection list displays picture files.
   - Picture files of the selected file type from the project folder "GraCS".
     If a folder is entered in the "Use directory for pictures:" text field, the picture files stored there are displayed.
     You can find information about custom pictures in section "How to insert custom pictures in an extended status display (Page 153)".
   - You can use the file filter to find file names more quickly.

   Note

   Assigning a picture

   Double-click the desired picture file.
   - The first double-click assigns the basic picture and the second double-click assigns the flash picture.
     If a flash picture is configured, the display changes between the basic picture and flash picture.
   - If you want to delete a picture for a state, select the state in the table and select the appropriate menu command from the context menu.

9. Click the "OK" or "Apply" button. The settings will be accepted.
10. Repeat steps 7 through 9 for all the combinations for which you wish to specify pictures.
11. Click "OK".

9.11.2.9 Folder for custom pictures

Using custom pictures

- As of PCS 7 8.1, the "PCS7CustomPictures" folder is automatically created in the "GraCS" project folder when the project editor is opened.
  - The "PCS7CustomPictures" folder is the default folder for the files of custom pictures.
  - You can create additional folders in the "GraCS" project folder for custom pictures.
- You configure the representation of custom pictures of APL block icons in the properties of the APL block icon:
  "Configurations > "Folder for pictures" attribute

- **The default is "PCS7CustomPictures"**
  If no value is configured for the "Folder for pictures" attribute and the OS project is compiled, the following applies:
  The default value "PCS7CustomPictures" is entered for the "Folder for pictures" attribute if no value is configured for the instances of APL block icons.
- Files of the custom pictures are used when compiling the OS for process display, if the files of the custom pictures are located in the "GraCS" project folder or its subfolders.
  - The configured picture file from the registered subfolder is used even if a file of the same name is located in the "GraCS" project folder.
  - The file from the "GraCS" project folder is used when the configured "Folder for pictures" contains no file with the name of the configured picture file.

Note

Software update as of PCS 7 V8.1

The pictures of the APL block icons remain unchanged if the following conditions are met:

1. The APL block icons were configured with PCS 7 as of V8.1.
2. The pictures of the APL block icons are stored in the configured subfolder of the "GraCS" project folder.

Recommendation

If you want to select files of the custom pictures, these picture files should be stored in a separate folder in the "GraCS" project folder.
Enter the name of this folder In the "Use folder for pictures:" text field when configuring the extended status display.

- The file selection list shows the picture files of the selected file type.
- If the folder for custom pictures is blank, the only picture files shown in the file selection list are those from the "GraCS" project folder.

Additional information

Section "How to insert custom pictures in an extended status display (Page 153)"

9.11.2.10 How to insert custom pictures in an extended status display

You can configure extended status displays and block icons in such a way that custom pictures are displayed in process mode.

If only the displayed object symbols are to be changed for APL block icons, follow the procedure that is described in section "How to configure block icons with custom pictures (Page 182)".

Objective: Customized representation of the "Motor" block icon

An extended status display is integrated in the customized object of the "Motor" block icon.

The block icon is to be adapted so that the user's own symbols for a pump are displayed in process mode.

The block icon is to be supplemented by additional objects.

Status	Desired block icon	Original name
Pump off	pump_off.emf	apl_bi_MotL_off.emf
Pump off	pump_on.emf	apl_bi_MotL_on.emf
Pump defective	pump_eff.emf	apl_bi_MotL_err.emf

Requirement: The adaptation should not be lost due to a software update.

Precondition

- The files for the desired block icon have been created.

Procedure for example

1. Select the block icon.
2. Select the menu command **Edit > Customized object > Edit…**.
   Use this command to split up the elements of the block icon.

   Note
   Editing

   Do not select "Ungroup" from the menu under any circumstances. This ungroups the customized object, and the entire configuration of the block icon will be deleted.

3. Select the object area that you want to customize (this is the circle for the "Motor" block icon).
   This graphic element was realized as a so-called "Status display (extended)". Multiple objects overlap in the block icon but you can move the elements for editing. You can remove unneeded elements from the block icon with the menu command **"Delete"**.
4. Select the menu command **"Delete"** in the shortcut menu.
   The top object is removed.
5. Open the shortcut menu and select the menu command **Configuration dialog...**.
   The "Properties of the extended status display" dialog box opens.
6. Switch to the "Assign pictures" tab.

   Note

   Read section "Folder for custom pictures (Page 152)".

   In the "Folder for pictures" text field, enter the name of the folder containing the files of the custom pictures.

7. Select the first row, "Index 0".
   The preview shows the pictures you have assigned.
8. Check that the "*.wmf,*.emf" option button is activated.
   This option enables all pictures with file name extension "*.emf" and "*.wmf" to be displayed.

9. Double-click the "pump_off.emf" file in the list containing the pictures.
   The preview and the list indicate that the original motor representation in the basic picture was replaced with the pump representation.
10. Insert the additional objects into the block icon.
11. Select the menu command **Edit > Customized object > Exit...**.

Additional information

Section "Use and creation of customized objects (Page 190)"

9.12 Configuring an extended analog display

9.12.1 Working with the extended analog display

Representation in the extended analog display

The extended analog display shows the value of an analog block I/O. The value is shown in color according to the current alarm state of this input/output.

When using the "User-configurable message classes" function, observe the information in section "Configuring the PCS 7 message system" in manual "PCS 7 Engineering System".

Overview of the configuration steps

Inserting and configuring the extended analog display comprises the following steps:

Step	Content
1	Inserting the extended analog display (Page 156)
2	Configuring the extended analog display (Page 157)
3	Connecting the tags (Page 157)

9.12.2 How to insert an extended analog display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbar**
   – In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.
3. In the "Standard" dialog box, select the "Analog Display (extended)" object in the "Smart Objects" folder in the tree view.
4. Move the mouse pointer to the drawing area.
   The mouse pointer becomes a small status display cursor.
5. Hold down the mouse button and draw a rectangle the size of the extended analog display.
   The "Extended analog display properties" configuration dialog opens.

9.12.3 How to configure an extended analog display

Procedure

1. Open the "Extended analog display properties" configuration dialog box.
   - If you have just inserted the extended analog display, the configuration dialog box will already be open.
   - If you want to change the configuration subsequently, open the shortcut menu and select the menu command **Configuration dialog…**.
     The "Extended analog display properties" dialog box opens.
2. Assign the desired colors to the various alarm states.
3. Click "OK".

9.12.4 How to make the tag connection for the extended analog display

Procedure

1. Open the shortcut menu of the extended status display and select the menu command **Properties**.
   The "Object Properties" dialog box opens.
2. Define the following settings for the "Miscellaneous" property:
   - For the "Group value" attribute, configure the tag connection with the "EventState" tag of the desired block instance.
   - For the "Value" attribute, configure the tag connection with the tag that represents the corresponding analog value.
3. Click the title bar and select the command **Close** in the shortcut menu.

9.13 Configuring an input/output field

9.13.1 Working with input/output fields

Introduction

You use input/output fields for the input or output of values. Input/output fields can process various data formats, such as binary, decimal, string or hexadecimal.

Characteristics of an input/output field

You can use the "I/O field" object differently:

- As an output field
- As an input field
- As a combined input and output field

9.13.2 How to configure an input/output field

Introduction

You configure an input/output field in the Graphics Designer.

Note to reader

The following is an overview of the configuration steps.
You can find the detailed configuration steps in manual *Process Control System PCS 7; Getting Started - Part 1*.

Overview of the configuration steps

The configuring of an input/output field comprises the following steps:

Step	Action
1	Dragging the "I/O field" object from the object palette onto the drawing area.
2	In the "Configuration" dialog box: Interconnecting the relevant tag
3	Specifying the relevant field type
4	If desired: Entering a static text for further explanation of the input/output field.

9.14 Configuring a group display

9.14.1 Overview of the group display

Introduction

A group display informs the plant operator about the message status of a process tag in process mode. This allows the plant operator to quickly detect alarms, warnings, or errors. The group display is available as a standard object in WinCC that you can insert in a process picture. A group display is configured using wizards in WinCC. As with all other dynamic objects, you set additional properties for this object in the "Properties" and "Event" tabs.

You can also customize the representation of the group display to your requirements.

Group display in process pictures

The group display enables you to display the message status of a process tag directly in the process picture. From each group display, the plant operator can switch to other process pictures or faceplates in process mode.

Group display in the overview area

The group displays in the overview area provides the plant operator with an overview of the status of the entire plant in process mode. The group displays are located next to the selection button for the respective area pictures. You assemble the messages of the group displays from the lower-level process pictures that belong to this area. The group displays in the overview area are always displayed.

The group displays in the overview area are displayed by default. This does not require configuration.

Updating group displays

Group displays are updated:

- When the project is downloaded.
- When saving in the WinCC "Picture Tree Manager" editor with "Recalculate the group display hierarchy completely while saving" check box selected
  You use this update when you simulate process mode from SIMATIC Manager on the Engineering Station.
- When starting the Project Editor with the "Create/update group displays" check box activated

Options for the dynamization of a group display

The following options are available for the dynamization of a group display:

- Interconnecting the group display with a process tag (Page 165)
  You connect the group display to a block in a process tag or control module to enable the display of messages from the assigned block to the plant operator in process mode.
- Interconnecting group displays with pictures (Page 167)
  You connect the group display to a picture so that messages from the picture are displayed in process mode.
- Picture selection with group display (Page 170)
  You connect the group display to a picture so that if there is an incoming message, the plant operator can switch directly to the picture in which the message was generated. You can use this function for dynamization of a group display and for dynamization of other picture objects.

9.14.2 Displaying a group display in process mode

Introduction

Message types are displayed by the "Group Display" object in five display areas arranged side-by-side. The supporting visualization makes use of display areas in different colors, flashing modes, and text display. The default colors and flashing modes in the object correspond to those commonly used in process engineering.

The figure below shows an example group display.

The following message types are distinguished and preset to defaults:

Message type	Field in the group display	Class
Process alarm	1	• A (AH, AL): – Alarm high, Alarm low – white text on a red background – flashing, if incoming and not acknowledged
	2	• W (WH, WL): – Warning high, Warning low – black text on a yellow background – flashing, if incoming and not acknowledged • T (TH, TL): – Tolerance high, Tolerance low – white text on a blue background – flashing, if incoming and not acknowledged If a warning message and a tolerance message exist simultaneously, the warning message has higher priority and is displayed.
Process control alarm	3	• S: – AS process control fault, OS process control fault – yellow text on a black background – flashing, if incoming and not acknowledged • F: – AS process control error – yellow text on a black background – flashing, if incoming and not acknowledged • MR: – Maintenance request – yellow text on a black background – flashing, if incoming and not acknowledged
Operator control display	4	• O (OR): – Operator request – white text on a dark magenta background – not flashing, if incoming
Lock messages	5	• X: – Messages locked – white text on a gray background – not flashing, if incoming

You can change the default appearance to suit your individual requirements.

Additional information

- Online help for *WinCC Information System*

9.14.3 Configuring a group display

9.14.3.1 Group display configuration options

Customization options for a group display

You can customize the group display on the basis of the default group display in two steps:

- Adaptation of the display of each individual message class in process mode. In WinCC, the message classes referred to as message types. This term will be used below.
- Assignment of the message types to the individual buttons of the group display. Up to 8 buttons can be configured for a group display. By default, the group display shows five buttons.
  The message types are assigned to a button using a bit number from the "EventState" tag. 16 different message types, which can all be visualized, can be saved in the "Event State" tag. The individual bits of this tag are preset as follows and assigned to the bit numbers in the group display.

When using the "User-configurable message classes" function, observe the information in section "Configuring the PCS 7 message system" in manual "PCS 7 Engineering System".

The bit assignment in the "EventState" tag

Bit in the "EventState" tag	Associated message type	Bit number
31 15 – Acknowledgment bit	AH, high high alarm	1
30 14 – Acknowledgment bit	AL, low low alarm	2
29 13 – Acknowledgment bit	WH, high alarm	3
28 12 – Acknowledgment bit	WL, low alarm	4
27	TH, tolerance high	5
26	TL, tolerance low	6
25 9 – Acknowledgment bit	S, process control message (system)	7
24 8 – Acknowledgment bit	F, process control message (failure)	8
23 7 – Acknowledgment bit	MR, preventive maintenance	9

Bit in the "EventState" tag	Associated message type	Bit number
22 6 – Acknowledgment bit	PM, process message	10
21 5 - Acknowledgment bit	PM, operating message	11
20	OR, operator request	12
19	OM, operator input message	13
18	AS, AS status message	14
17	OS, OS status message	15
16	X, Out of Service message	16

M – preventive maintenance

SA – AS status

SO – OS status

Default assignment of the message types to the bits in the "EventState" tag

The group display is based on the group value from the 32-bit "EventState" tag. The default setting for a group display is as follows:

Button in the group display	Bits in the "EventState" tag	Message type
1	30, 31	AH, AL
2	29, 28, 27, 26	WH, WL, TH, TL
3	25, 24, 23	S, F, MR
4	20	OR
5	16	X

9.14.3.2 How to insert a group display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.
3. In the "Standard" dialog box, select the "Group Display" object in the tree view in the "Smart Objects" folder.
4. Move the mouse pointer to the drawing area.
   The mouse pointer changes to a group display cursor.
5. Hold down the mouse button and draw a rectangle the size of the group display.

6. Configure the group display.
   You can find additional information about this in section "How to configure a group display (Page 164)".
7. Create the connection by means of a wizard:
   – If you wish to connect the group display to a block, start the "Connect a Group Display to a PCS 7 Process Tag" wizard.
     You can find additional information about this in section "Interconnecting the group display with a process tag (Page 165)".
   – If you want to connect the group display to a picture, start the "Connect a Group Display to a Picture" wizard.
     You can find additional information about this in section "Interconnecting group displays with pictures (Page 167)".
8. Open the shortcut menu for the object and select the menu command **Properties**.
   The "Object properties" dialog box opens.
9. Specify the parameters for the group display.

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

9.14.3.3 How to configure a group display

Requirement

The group display has been inserted in the process picture.

Procedure

1. Open the shortcut menu for the group display and select the menu command **Properties**.
   The "Object Properties" dialog box opens.
2. Select the "Properties" tab.
3. Select the property "Group display > Geometry" in the tree view.
4. In the "Static" column, enter the desired value, in order to define the size of the group display using the corresponding attributes.

   Note

   If you enter "yes" for the "Same size" attribute, all fields are set to the same size equivalent to the specified total width.

   The value "0" means that this button is not displayed and is not taken into consideration when the "same size" is calculated.

5. Select the property "Group display > Message types" in the tree view.

6. Double-click the "Message types" attribute.
   A list containing all available message types is displayed.
   You can find additional information in section "Configuration options for a group display (Page 162)".
7. Select the message type you want to configure and click "OK".
8. Make the appropriate settings for the display in process mode.
9. Follow the same procedure for all message types that you want to display in process mode.
10. Select the "Group display > Assignment" property in the tree view.
11. Double-click the "Message Types for Button [cons. number of the button]" attribute.
    The "Text Input" dialog box opens.
12. Use the bit to select the message type you want to assign to the button.
13. Click "OK".

    Note

    If you want to assign multiple events to a button, enter the different bit numbers one after the other, separated by commas.

    The order in which they are entered also serves to specify the priority: If there are multiple events pending for a button, the event that is farthest to the left is visualized.

    You can find additional information about this in section "Group display configuration options (Page 162)".
14. Click the title bar and select the command **Close** in the shortcut menu.

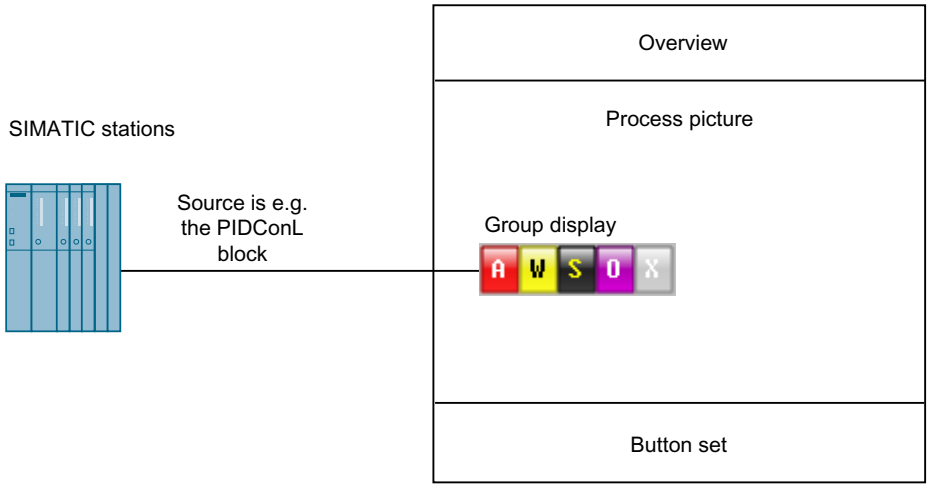
9.14.4 Interconnecting the group display with a process tag

9.14.4.1 Interconnecting the group display with a process tag

Overview

When using the "User-configurable message classes" function, observe the information in section "Configuring the PCS 7 message system" in manual "PCS 7 Engineering System".

If you connect a group display to a block using a direct interconnection, the plant operator can closely monitor this block during runtime. This group display can be inserted in any process picture. The block must have the system attributes "S7_m_c" and "S7_tag," and these attributes must be set to the value "true".



Make the interconnection with the dynamic wizard "Connect a group display with a PCS 7 process tag".

The block can be configured as follows, for example:

- In a CFC
- In a process tag as an instance of a process tag type
- In a control module as an instance of a control module type

9.14.4.2 How to interconnect a group display with a process tag

Requirements

- The "Group Display" object has been inserted into the process picture.
- The static properties have been specified, for example, the font or geometry.

Procedure

1. Open the process picture in the Graphics Designer.
2. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Dynamic Wizard" check box.
   This "Dynamic Wizard" dialog box opens.
3. Select the required group display in the process picture.
4. In the "Dynamic Wizard" dialog box, select the "Standard Dynamics" tab.
5. Double-click the entry "Connect a group display to a PCS 7 process tag".
   The wizard opens.
6. Click "Next" in the first step of the wizard.
   The "Set options" step opens.

7. In the "Set options" step, click the "Browse" button next to the text field.
   The tag selection dialog opens.
8. Select the desired block in the "List of all tags" and click "OK".
   The block is accepted and the tag selection dialog closes.

   Note

   If there are many tags in your project, be sure to use the filter function. You can find additional information about this in the online help for *WinCC Information System*.

9. Click "Next".
   The "Finished!" step opens.
10. Check your settings.
11. Click "Finish".
    The group display is connected to the block.

9.14.5 Interconnecting group displays with pictures

9.14.5.1 Interconnecting group displays with pictures

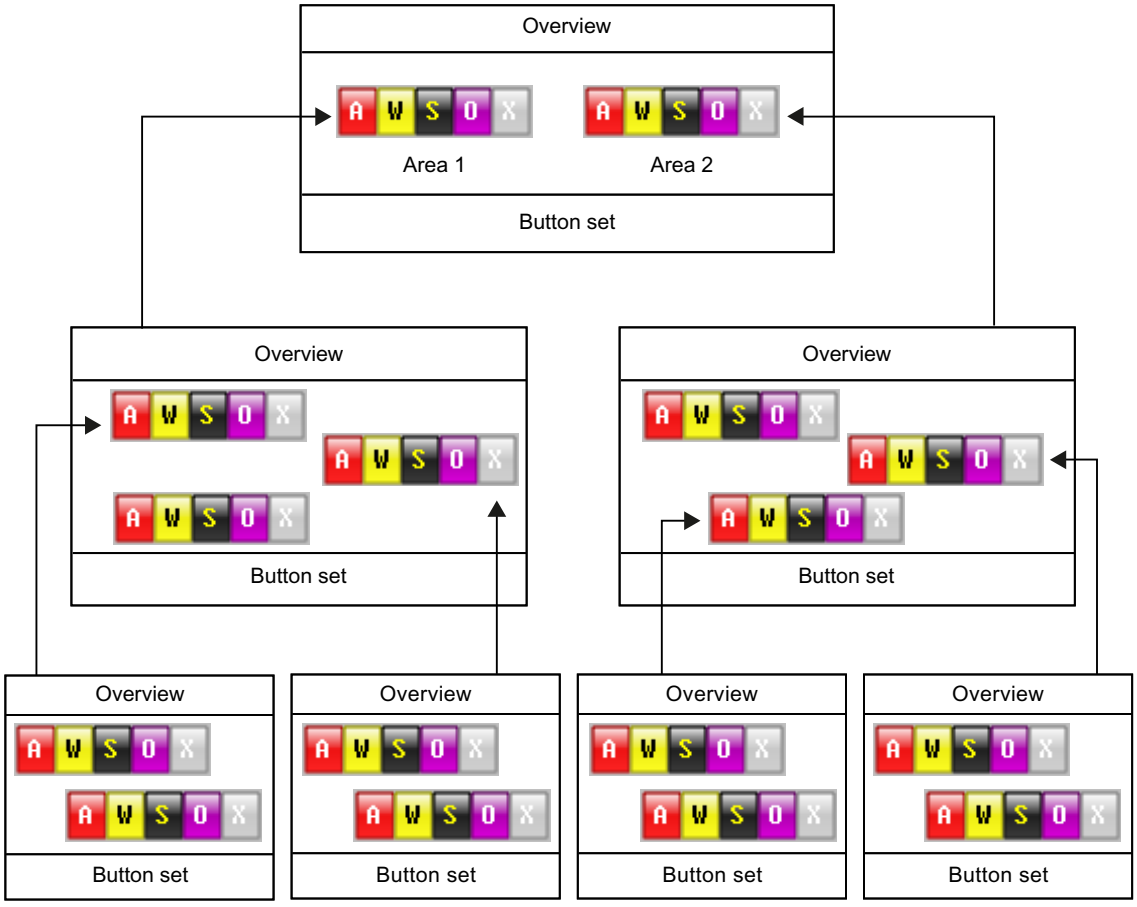
Introduction

If a group display is connected to a process picture, information from a hierarchically lower-level process picture can be displayed in a higher-level process picture.

Function in process mode

When a message appears in the lower-level process picture on any group display, the message is "forwarded" so that the information is also made available to the operator in the higher-level process picture.

The operator can then click the group display in the higher-level process picture to go directly to a lower-level process picture. The ability to quickly navigate to the source of a malfunction is essential for the plant operator and enables straightforward and simple process checks.



Picture hierarchy

For process control within the OS, a picture hierarchy is needed that guides the plant operator to the pictures in which danger states are displayed, e.g. alarms. The picture hierarchy is derived from the plant view and mapped in the Picture Tree Manager in WinCC Explorer. The group display can only receive and forward messages if these pictures are appropriately arranged in the hierarchy.

Creating a group display hierarchy

The following options are available for creating a group display hierarchy:

- Creation using the dynamic wizard "Link group display with picture".
- Automatic creation

Creation of the group display hierarchy using the dynamic wizard

The group display must be configured in every picture in accordance with the picture hierarchy.

Configure the interconnection with the picture using the dynamic wizard "Link group display with picture".

You can configure an action with the dynamic wizard "Picture selection via group display". Then, for example, when a message is pending during process control, you can switch with a mouse-click directly to the picture in which the message is generated.

Automatic creation of the group display hierarchy

Group displays can be created automatically on the basis of the picture hierarchy.

A group display is inserted in each picture that has pictures directly below it. The group display is positioned automatically in the top left corner of a process picture.

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

9.14.5.2 How to automatically create a group display hierarchy for pictures

Requirement

The WinCC project is open.

Procedure

1. Select the "OS Project Editor" in WinCC Explorer
2. Select the shortcut menu command **Open**.
3. Select the "Message display" tab.
4. Select the "Create/update group displays" check box.

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

9.14.5.3 How to interconnect a group display with a picture

Requirements

- The "Group Display" object has been inserted into the process picture.
- The static properties of the group display have been specified, for example, the font and geometry.

Procedure

1. Open the process picture in the Graphics Designer.
2. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Dynamic Wizard" check box.
     This "Dynamic Wizard" dialog box opens.
3. Select the required group display in the process picture.
4. In the "Dynamic Wizard" dialog box, select the "Standard Dynamics" tab.
5. Double-click the entry "Link group display with picture".
   The wizard opens.
6. Click the "Next" button in the first step of the wizard.
   The "Set options" step is opened.
7. Click "Browse" next to the input box in the "Set options" step.
   The "Picture browser" dialog box opens.
8. Select the desired picture and click "OK".
   The picture is applied.
9. Click "Next".
   The "Finished!" step opens.
10. Check your settings.
11. Click "Finish".
    The group display is connected to the picture.
12. Finally, define the event that is to be used to call up the picture, for example, a right mouse click.
    You can find additional information about this in section "How to define the type of picture selection (Page 170)".

9.14.5.4 How to define the type of picture selection

Requirements

- The "Group Display" object has been inserted into the process picture.
- The group display has been connected to a picture.

Procedure

1. Open the process picture in the Graphics Designer.
2. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Dynamic Wizard" check box.
     This "Dynamic Wizard" dialog box opens.
3. Select the required group display in the process picture.
4. In the "Dynamic Wizard" dialog box, select the "Picture Functions" tab.
5. Double-click the entry "Picture selection via group display".
   The wizard opens.
6. Click the "Next" button in the first step of the wizard.
   The "Select trigger" step is opened.
7. Select from the list the operator action with which the plant operator can open the picture via the group display, and click "Next".
   The "Finished!" step opens.
8. Check your settings and – if no corrections are necessary – click "Finish".
   The group display is connected to the operator action.

Creation of process pictures – advanced 10

10.1 Overview of additional options when creating process pictures

Additional options

To enable you to create process pictures for complex plant structures and to make customized settings, PCS 7 provides you the following additional objects beyond the simple standard functions:

Object	Description
Faceplate	Faceplates visualize specific values of the associated technological block in the automation system in process mode. Block icons are used to call faceplates in process mode.
Alarm message	You can have messages displayed directly in the process picture using a standard object in the Graphics Designer.
Customized object	A customized object is an object in the Graphics Designer that you can create from individual standard objects.
Customized object template	A customized object template is an extension of customized objects that offers you the convenience of making modifications in one central place.
Picture window	A picture window is a standard object in the Graphics Designer that you can insert into a process picture so that another picture can then be inserted into this picture window.
Cross-reference lists	A cross-reference list provides a good overview of all tags you have used in your project.

10.2 Function and use of block icons and faceplates

10.2.1 Use of faceplates

Introduction

Faceplates visualize specific values of the associated technological block in the automation system in process mode, such as:

- Measured values
- Operating limits
- States of a process tag

These values are displayed in a separate window. For this purpose, the faceplate automatically retrieves all relevant current information in process mode. In addition, faceplates enable operator control in process mode and show the plant operator all block inputs and outputs required to control a process. Faceplates are "normal" PDL files.

When you connect the structure type of a tag to a faceplate, all tags contained in a faceplate are automatically linked to the associated block parameters and made dynamic.

PCS 7 comes with ready-made faceplates for various block types of the PCS 7 libraries.

Opening faceplates

Faceplates are opened in runtime with an event script, for example, a mouse click. You can also use a block icon or any other picture object you wish, such as a status display or static object. Normally, you use block icons provided by PCS 7 for this purpose. Block icons are a symbolic representation of faceplates that provide basic information to the plant operator about the status of the associated process tag. The plant operator can then call up detailed information about the process tag by selecting the faceplate from a block icon.

Calling complex faceplates from picture objects ensures brief picture selection times and a clear overview of the entire process picture.

Storing faceplates

Assuming standard PCS 7 installation, the faceplates will be located in the following directory:

[Name of the project directory]\[Name of the project folder]\Wincproj\[Name of the OS]\GraCS

Where:

Name of the project directory: …\Program Files\Siemens\STEP7\S7Proj\[ProjectName]

Name of the project folder: The project folder "[Project name]_Prj" is limited to 8 characters.

The scripts needed in order to use the faceplates are not stored on a project-specific basis. You can find these scripts in the directory "Wincc\aplib\FaceplateDesigner".

10.2.2 Relationship between faceplates and block icons

Standard block icons

PCS 7 provides you with a corresponding block icon for each technological block. These standard block icons already contain a call script for the corresponding faceplate, thus eliminating the need to set additional parameters, except for the interconnection to the specific process tag. Block icons are executed as customized objects.

Using block icons

There are two options for using block icons:

- Automatically
  Block icons can be created automatically using the "Create/Update Block Icons" function in the SIMATIC Manager. With this function, the block icons are automatically inserted into a process picture and connected to the corresponding process tag on the basis of the plant hierarchy. There is no further configuration work to do. After first creating the block icons in the process picture, you have to put them in whichever positions you wish and, if necessary, insert other static or dynamic objects. If you delete blocks from CFC charts, for example, the corresponding block icons are deleted the next time this function is executed. If you execute the "Create/Update Block Icons" function, PCS 7 automatically uses block icons from the "@PCS7TypicalsAPL<Version>.pdl" file.
- Manually
  You can manually insert additional block icons into a process picture, for example, when the process tags are arranged in the plant hierarchy in such a way that they are not covered by the automatic function.
  For blocks of the PCS 7 Basis Library and PCS 7 Advanced Process Library (APL), use the block icons from the template file "@TemplateAPL<Version>.pdl".
  Use the "copy" and "paste" functions to insert the block icons into the process picture. Then connect these block icons to a process tag using drag-and-drop.

You can find background information for the "Create/Update Block Icons" function in section "Procedure for creating block icons (Page 75)".

See also

Block icons and the @PCS7TypicalsAPL<Version> file (Page 176)

Block icons and the @TemplateAPL<Version>.pdl file (Page 177)

Rules for using multiple template files (Page 177)

10.2.3 Block icons and the @PCS7TypicalsAPL<Version> file

Overview

The "@PCS7TypicalsAPL<Version>.pdl" file contains all the templates for block icons.

If you execute the "Create/Update Block Icons" function, PCS 7 automatically uses block icons from this file.

Information on using multiple templates for block icons is provided in the section "Rules for using multiple template files (Page 177)".

Changes to the "@PCS7TypicalsAPL<Version>.pdl" file

If you want to change the standard block icons or create your own block icons, use block icons from this file as a basis. If, for example, you want to view additional measured values in the icon view in process mode or if you would generally like a different display, create your own block icons for this.

NOTICE
No changes in the original file Under no circumstances should you amend the original file, as changes to the original file will be overwritten during software updates. Create a new file, which must always begin with the fixed name component, "@PCS7TypicalsAPL<Version>". You can specify the rest of the file name yourself. If you want to change existing block icons, copy the desired block icon from the "@PCS7TypicalsAPL<Version>.pdl" file to the new file and adapt it there. You can create up to 11 different template files for the block icons.

Different versions of block icons

There can be several versions of block icons for one process tag. These versions are differentiated using the "type" attribute: The value of this attribute describes the version. If, for example, you wish to view a version of the block icon for a valve, you will find the value "@VlvL/2" there. Using the part of the value that is displayed after the "/" you can control which versions of the block icon will be generated. Therefore, you must enter this part in the object properties of the block instance. If you do not enter parameters in the block properties of the block instance, the standard block icon will be automatically generated: This is the block icon that has the identifier "/1" under the "type" attribute, e.g. "@VlvL/1".

You find the value of the "type" attribute as follows:

1. Open the "@PCS7TypicalsAPL<Version>.pdl" file.
2. Highlight the block icon and then select the menu command **View > Properties**.
   The "Object properties" dialog box opens.
3. Select the "General" property from the tree view.
   The associated attributes are displayed.

Additional information

Refer to section "Configuring Block Icons" in the online help for Advanced Process Library for additional information on configuring block icons.

10.2.4 Block icons and the @TemplateAPL<Version>.pdl file

Overview

The "@TemplateAPL<Version>.pdl" file basically contains the same block icons as the "@PCS7TypicalsAPL<Version>.pdl" file, with one important difference: The "type" attribute has different values in each of the two files.

Information on using multiple templates for block icons is provided in the section "Rules for using multiple template files (Page 177)".

Manually inserting block icons

If you wish to manually insert additional block icons into a process picture, and these are not automatically derived from the plant hierarchy, you must use the file "@TemplateAPL<Version>.pdl":

If, for example, you want to show an additional process tag in a process picture. This block icon will be deleted the next time the "Create/Update Block Icons..." function is executed, since the process tag is not located at the required position in the plant hierarchy. You can only prevent this block icon from being deleted by using a block icon from the "@TemplateAPL<Version>.pdl" file.

Note

If you have changed the block icons in the "@TemplateAPL<Version>.pdl" file, you need to create a backup copy before you update the PCS 7 software, because this file is overwritten.

Recommendation
If you want to change existing block icons, copy the desired block icon from the "@TemplateAPL<Version>.pdl" file to the new file and adapt it there.

10.2.5 Rules for using multiple template files

A PCS 7 project contains the following standard template files:

- @TemplateAPL<Version>.pdl
- @PCS7TypicalsAPL<Version>.pdl

The files basically contain the same block icons. The most important difference between the block icons contained in the files is the value for the "type" attribute. This value indicates assignment to the AS program libraries.

Default templates

Two versions each of this file are installed as of PCS 7 V8.0:

- "@TemplateAPLV8.pdl" and "@PCS7TypicalsAPLV8.pdl":
  This file is used by default as of PCS 7 version 8.0 and contains the latest block icons.
- "@TemplateAPLV7.pdl" and "@PCS7TypicalsAPLV7.pdl":
  This file contains the block icons of PCS 7 version 7.1.

Note

Using the template picture for V7 or V8 block icons

You can use the "@PCS7TypicalsAPLV7.pdl" template picture if the following preconditions are met:

- You do not want to use new functions from PCS 7
- You do not want to use the latest block icons from the "@PCS7TypicalsAPLV8.pdl" template picture for updating the picture objects, for example, because the icon sizes have been changed

The "@PCS7TypicalsAPLV8.pdl" file needs to be renamed or deleted in order to use the "Create/Update Block Icons" function and compiling processes of this "@PCS7TypicalsAPLV7.pdl" template picture in subsequent executions. Renamed files must not start with the following characters:

- @PCS7Typicals
- @TemplateAPL

Recommendation:

Always use the same versions of the "@TemplateAPL<Version>.pdl" and "@PCS7TypicalsAPL<Version>.pdl" files for a PCS 7 project.

What templates are applied?

The "Create/Update Block Icons" function first searches for used or newly inserted block icons in @PCS7Typicals<XYZ>.pdl template pictures.

A block icon can be contained in several template pictures (for example, in the template files of the PCS 7 versions).

If you want to check to what block icon the "Create/Update Block Icons" function can be applied, proceed as follows:

1. Open the "GraCS" project folder in the Windows Explorer.
2. Sort the file names in reverse alphabetical order (Z-A 9-0).
3. The template picture shown first in this order (@PCS 7Typicals<XYZ>.pdl), in which the block icon is present, is used by the "Create/Update Block Icons" function.

Note

Project editor copies template files

The current template files are copied to the project when the project editor is opened.

If you are not using the current template files, you must ensure that the required templates are used in the project after opening the project editor. Delete the current template files in the project if they are not required.

See also

Relationship between faceplates and block icons (Page 175)

10.2.6 Display types of faceplates

Introduction

When you connect any object from the object palette of the Graphics Designer to a process tag, you must specify a suitable display type.

Display types of faceplates

The following options are provided in the wizard to set up this connection:

Display type	Description
Loop display	This display type shows all possible views, such as standard, alarm, or limits, simultaneously and arranged horizontally. Possible layout of the loop display: • Loop > Working area This representation fills the entire working area. The faceplate cannot be moved or resized. The faceplate is deselected by opening a new process picture using a button in the overview area. • Loop > Process window The representation is placed in a separate window that opens in addition to the process picture. The plant operator can move this window, change its size and close it.
Group display	The representation is placed in a separate window that the plant operator can move and close. Compared to the loop, only one view is active here at a given time. The plant operator can switch to a different view using a drop-down list. The plant operator can switch from the group display to the loop display in the process window by clicking a button.

10.2.7 Overview of block icon and faceplate configuration tasks

Introduction

If you want to manually insert block icons into your process pictures in addition to those generated automatically and want to connect them to a process tag, you have several options for doing this:

Option 1

In general, you will use this option.

Step	Action
1	How to insert a block icon (Page 180)
2	How to connect a block icon to a process tag (Page 180)

Option 2

In exceptional cases, you can use the following procedure:

Step	Action
1	How to connect an object to a faceplate (Page 181)

10.2.8 How to insert a block icon

Procedure

1. Open the process picture in the Graphics Designer.
2. Also open the picture @Template.pdl.
   The various technological block icons are provided as a template in this picture.
3. Select the desired block icon in this picture and then select the menu command **Edit > Copy**.
4. Now switch to the process picture and select the menu command **Edit > Paste**.
   The block icon is inserted into your process picture. It is not yet connected to a process tag.

10.2.9 How to connect a block icon to a process tag

Requirement

The block icon is available in the process picture.

Procedure

1. Open the process picture in the Graphics Designer.
2. If the "Tags" dialog box ("Tags" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Variables" check box.
     The "Tags" dialog box opens.
3. Select the desired block icon in the process picture.
4. In the "Tags" dialog box, navigate under "ES Variables" to the CFC chart that contains the desired process tag.

   Note

   The detail window only shows the process tags that are suitable for the selected block icon.

5. Move the desired block from the detail window onto the associated block icon using drag-and-drop.
   The block icon is automatically connected to all the required tags of the process tag.
6. Repeat steps 3 to 5 for all the other block icons.
7. Save and close the process picture and then close the @Template.pdl file.

10.2.10 How to connect an object to a faceplate

Introduction

You usually work with the block icons provided by PCS 7. In special cases, you can use other picture objects.

Requirement

A picture object has been inserted in the process picture.

Procedure

1. Open the process picture in the Graphics Designer.
2. Select the required picture object.
3. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Dynamic Wizard" check box.
     This "Dynamic Wizard" dialog box opens.
4. In the "Dynamic Wizard" dialog box, select the "Picture Functions" tab.

5. Double-click "Picture selection via measurement point" in the list.
   This "Welcome to the Dynamic Wizard" dialog box opens.
6. Click "Next" in the first step of the wizard.
   The "Select trigger" step opens.
7. Select the desired trigger.
   In this way, you define the event the plant operator uses to open the faceplate in runtime.
8. Click "Next".
   The "Set options" step opens.
9. In the "Set options" step, select the desired tag structure type in the list and click "Next".
   The "Set options" step opens.
10. Click the "Browse" button beside the text field.
    The tag selection dialog opens, showing you the process tags corresponding to the preselected structure type.
11. Select the desired process tag in the detail view and click "OK".
    The process tag is applied and the tag selection dialog closes.
12. Select the option button of the desired display type.
    You can find additional information about this in the section "Display types of faceplates (Page 179)".
13. Click "Next".
    The "Finished!" step opens.
14. Check your settings and click "Finish".
    The picture object is connected to the desired process tag.

10.2.11 How to configure block icons with custom pictures

Symbols are included in the block icons for the AS blocks that represent the states of an object, for example, "Motor On".

You can configure APL block icons so that custom pictures are displayed for these symbols in process mode (for example, other colors, other symbols).

The following adaptations are possible:

- Adapt all block icons of a type
- Adapt selected block icons

Displaying custom pictures in APL block icons

- As of PCS 7 8.1, the "PCS7CustomPictures" folder is automatically created in the "GraCS" project folder when the project editor is opened.
  - The "PCS7CustomPictures" folder is the default folder for the files of custom pictures.
  - You can create additional folders for custom picture files in the "GraCS" project folder.
- You can configure the folder for the files of the custom pictures in the properties of the APL block icons for the representation in process mode:
  "Configurations > "Directory for pictures" attribute

- **The default is "PCS7CustomPictures"**
  If no value is configured for the "Directory for pictures" attribute and the OS project is compiled, the following applies:
  The default value "PCS7CustomPictures" is entered for the "Directory for pictures" attribute if no value is configured for the instances of APL block icons.
- **Names of files for custom pictures - same name required:**
  The files must have the same names as the files of the corresponding pictures files for APL block icons.
- Display in process mode:
  - The custom pictures are displayed if they are in the folder that is entered in the "Directory for pictures" attribute of the block icon.
  - The standard pictures are displayed if the configured "Directory for pictures" contains no picture file with the standard name.

Note

Software update

For custom APL block icons to remain unchanged when the software is updated, the following requirements must be met:

- The APL block icons were configured with PCS 7 as of V8.1.
- The pictures of the APL block icons are stored in the configured subfolder of the "GraCS" project folder.

Example

Objective:
Custom presentation of the "Motor" block icon. The APL block icon is adapted so that the colors of the states are exchanged in process mode.

Method:
An extended status display is integrated in a "Motor" block icon. The pictures of the extended status display are to be replaced.

State	Original representation		Target representation	
	Picture file	Color	Picture file	Color
Motor ON	apl_bi_MotL_on.emf	Green	apl_bi_MotL_on.emf	red
Motor OFF	apl_bi_MotL_off.emf	Gray	apl_bi_MotL_off.emf	Green
Motor defective	apl_bi_MotL_err.emf	red	apl_bi_MotL_err.emf	Gray

Requirement:
The adaptation should not be changed due to a software update.

"Adapt all block icons of a type" procedure

1. Open the "GraCS" project folder in the Windows Explorer.
2. Copy the picture files that you want to adapt into the subfolder "PCS7CustomPictures".
3. Change the picture files in the subfolder "PCS7CustomPictures" so that the files show the desired representation (Replace/Change).

   Note

   The name of the picture files must be maintained.

   The export function of the Graphics Designer is **not** suitable for changing the picture files. To create the EMF files, use a graphics program that can create vector graphics. Note the dimensions of the original pictures.

Result: The representation is changed for all block icons.

"Adapt selected block icons" procedure

1. Open the "GraCS" project folder in the Windows Explorer.
2. Create a separate subfolder in the "GraCS" project folder (for example, the subfolder "Pump_Typx")
3. Copy the picture files that you want to adapt into the subfolder you created in the "GraCS" project folder.
4. Change the picture files in the subfolder you have created ("Pump_Typx") so that the files show the desired representation (Replace/Change, e.g. show the appropriate pump symbol).

   Note

   The name of the picture files must be maintained.

   Do **not** use the export function of the Graphics Designer to change the picture files.

5. In the Graphics Designer, open the picture in which the block icon is used.
6. Open the properties of the block icon.
7. Select the "Configurations" item in the tree view.
8. Enter the name of the subfolder you have created ("Pump_Typx") in the "Directory for pictures" input box.

Result:
The representation is changed for the selected block icons.

If you change a template file, the change is applied to all new instances of this block icon.

Additional information

Section "How to configure an extended status display (Page 151)"

10.2.12 To migrate customizations of block icons

As of PCS 7 V8.2, you can migrate some custom adaptations of APL block icons in the block icons of the Advanced Process Library.

Note

Replacing the Advanced Process Library (e.g. during the software update)

After you replace the library, block icons with new functions are available in the default template file of the product. When you use the default template file for the product, the customizations of APL block icons previously made in the project are lost.

The function enables efficient migration of customizations to the new APL block icons in a new template file for the plant. If you use this new template file, you combine the advantages of the new features with the customizations for your plant.

The table shows which portions of the customizations of APL block icons can be migrated to the new template file.

Customization	Applicable?
Size and/or position of internal objects	Yes
Z order of internal objects	Yes
"Normal" properties	Yes
Language-specific properties	Partially
Index properties	No
Internal layout of the block icons	No
Scripts (C or VBS) which are applied for dynamization	No

The following describes how to migrate the plant-specific adaptations to the current block icons.

Requirement

The following applies for the project:

- The OS Project Editor is running for the project. The following file is thus available in the project: @PCS7_Block_Icon_Migration.pdl
- The template file of the plant contains customized APL block icons.
  Template file of the plant: e.g. @PCS7TypicalsMyPlantV1.PDL

  Note

  Naming

  Read section "Rules for using multiple template files (Page 177)".

- If you want to transfer only selected properties of the template file, adapt the following file: PCS7BausteinsymbolMigration.cfg
  You can find this file in the "<WinCC project path>\WScripts\" folder.
  You can find information on this in the "Configuring parameters for the transfer" paragraph below.

Procedure

1. Make a backup copy of the existing project template file.
2. Open the following pictures in the Graphics Designer:
   - Standard template file of the product: @PCS7TypicalsAPLV8.PDL
   - Template file of the plant: e.g. @PCS7TypicalsMyPlantV1.PDL
3. Open the @PCS7_Block_Icon_Migration.pdl picture in the Graphics Designer.
4. Select the menu command **Migration > Migration of Block Icons.**
   The "Migration of Block Icons" dialog box opens.

   Note
   Migration menu command not available

   The "Migration" menu command is operable under the following condition:

   In the "Options" tab of the **Options > Settings>** menu, the "Deactivate all VBA events" check box is disabled.

5. Make the following settings:

Input box	Example for the selection
Selection of the product image (source for copying) - (default template file of the product)	@PCS7TypicalsAPLV8.PDL
Selection of the customized image from the customer (template file of the plant)	@PCS7TypicalsMyPlantV1.PDL

6. Click "Migrate".
   The migration is performed automatically in several steps:
   - Copy the block icons from the default template file for the product (product image) to a new template file.
   - Modify and check the objects contained in the block icons.

   The log file for the migration can be found in the directory of the WinCC project.
7. Save the newly created template file under the plant-specific name "Save as ...".
   Example for this: @PCS7TypicalsMyPlantV2.PDL

   Note
   Naming

   Read section "Rules for using multiple template files (Page 177)".

Evaluating the log file

You can find the log file "PCS7_Block_Icon_Migration.txt" in the "<WinCC project path> folder.

Situation when creating the APL block icon	Result in the log file
There is an object in the APL block icon of the project, but not in the APL block icon from the standard template file for the product (product image).	Error
There is an object in the APL block icon from the standard template file of the product (product image), but not in the APL block icon from the template file of the plant.	Warning
An object has different types in the block icon from the standard template file of the product and in the block icon of the template file of the plant. **Example:** • Block icon from the default template file for the product: Type: Input/ouput field • Block icon from the template file for the plant: Type: Dataset	Error

Configuring parameters for the transfer

Application case:

You want to transfer **only selected properties** of the plant-specific APL block icons to the new template file for the project.

Procedure:

Adapt the following configuration file: <wincc project path>\WScripts \PCS7BausteinsymbolMigration.cfg

1. Make a backup of this file.
2. Orient yourself with the commented-out examples when adapting the file.
   - Notes for examples are entered in English in the file.
   - Comment lines start with a semicolon.

10.3 Displaying messages

10.3.1 Using a message window – AlarmControl

Using a message window

You can configure a special message window in a process picture. You can view messages in this message window without having to toggle to the message list in process mode. You also have the option of making detailed settings for this message window. These includes the following:

- You can choose what types of messages are displayed.
- You can specify the information to be provided in the individual message blocks.
- You can set the exact contents of the message line.
- etc.

Additional information

- Section "Overview of the message system (Page 219)"

10.3.2 How to insert an AlarmControl

Procedure

1. In the Graphics Designer, open the process picture in which you would like to integrate a message window.
2. If the "Controls" dialog box ("Controls" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Controls" check box.
   The "Controls" dialog box opens.
3. Select the "Controls" tab.
4. Open the ActiveX Controls folder.
5. Select the "WinCC AlarmControl" control.
6. Move the mouse pointer to the drawing area.
   The mouse pointer changes according to the selected object.
7. Hold down the mouse button and draw a rectangle the size of your object.
   The "WinCC AlarmControl Properties" dialog box opens.
8. Set the "WinCC AlarmControl" properties.
   You can find information about the individual text fields and options in the online help for *WinCC Information System*.

9. Click "OK".
   The "WinCC AlarmControl Properties" dialog box closes.
10. In the shortcut menu of the AlarmControl, select the menu command **Properties** to define the properties and events.
    The "Object Properties" dialog box opens.
    You can find additional information about the individual text fields and options in the online help for *WinCC Information System*.
11. Define the properties and events.
    You can find additional information about the individual text fields and options in the online help for *WinCC Information System*.
12. Close the "Object properties" dialog box.

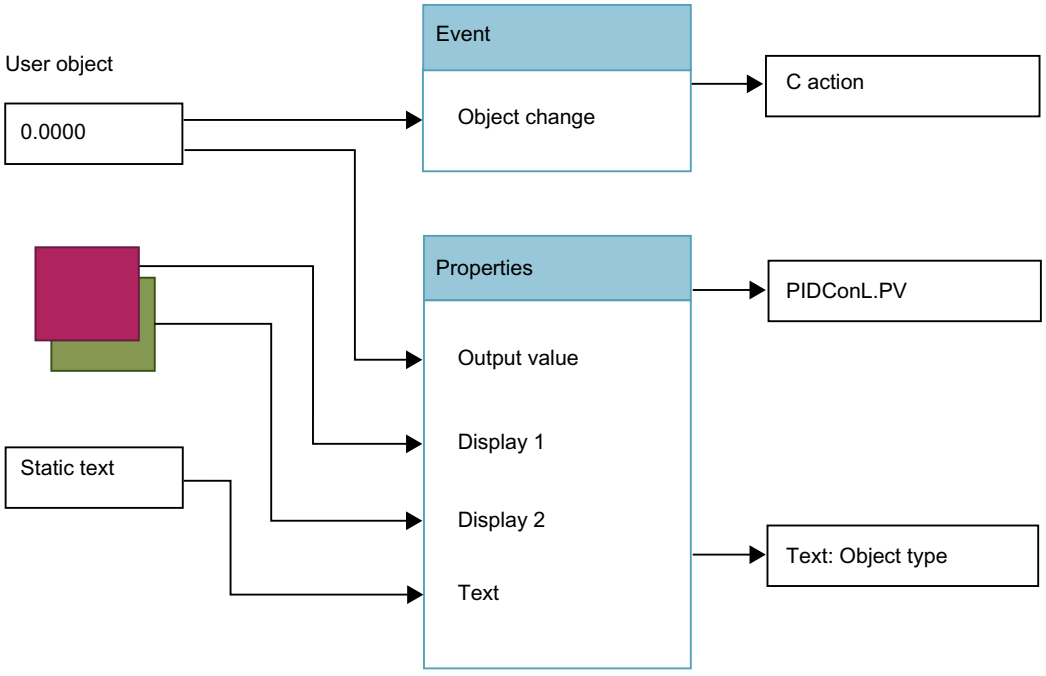
10.4 Use and creation of customized objects

10.4.1 Use and creation of customized objects

Customized objects

A customized object is a dynamizable object made up of individual objects, for which you can define the properties that you actually require. For example, you can implement group displays, I/O fields and status displays as individual objects. You specify the properties **once** for all attributes that remain constant. Afterwards, you can use the customized object again repeatedly without having to configure each individual object again and combine them into an object for every use.

Only those properties that are required for the customized object are visible for each individual object. You can variably set parameters for these properties and make them dynamic. Since only a selection of properties are visible due to your settings, connection to the tags is made easier. These properties can also be accessed from other WinCC applications, such as scripts.



Area of application of customized objects

It is useful to create your own customized object in the following situations:

- You want to show the plant operator information about certain technological blocks in process mode that the standard faceplates do not provide.
- You have created a custom block type by compiling a CFC chart in the CFC editor.

Storage of the customized objects for multiple use

Store customized objects in a library so you can reuse them easily. Customized objects that you remove from a library are copies of the original. This means that, if required, you can individually change and adapt each copy subsequently without these adaptations being overwritten every time the original is changed.

Note

By default, it is not possible to display a faceplate by clicking on a customized object.

10.4.2 Advantages of customized objects as compared to individual objects

Advantages of customized objects

Creating a customized object has the following advantages as compared to using individual objects:

- When you work with customized objects, only the properties that you actually need to configure or make dynamic are made available. This eliminates the need to select from a large number of properties common to all single objects.
- If the name of the block or CFC chart is changed, you need only make these changes on the customized object copies, rather than on each individual object.
- You can modify customized objects and supplement them with additional objects at any time.
- You can configure customized objects in a specific language – using the languages installed in WinCC.
- If you use C actions, only one large C action needs to be executed during runtime, rather than many small C actions. This is much better for performance reasons.

Additional information

- Online help for *WinCC Information System*

10.4.3 Overview of configuration steps of customized objects

Overview of the configuration steps

The creation of customized objects comprises the following steps:

Step	Content
1	Creating a customized object from individual objects (Page 192)
2	Configuring a customized object (Page 193)
3	Configuring properties of the customized objects (Page 194)

Step	Content
4	Storing a customized object for multiple use in a library (Page 195)
5	Inserting and instantiating a customized object in the process picture (Page 196)
6	For subsequent changes: Editing the customized object (Page 197)

10.4.4 How to create a customized object

Procedure

1. Open a process picture in the Graphics Designer.
2. Insert an individual object that you want to integrate into the customized object, for example, a group display, a status display or static text.
3. If a configuration dialog is opened, click "Cancel".
   The configuration dialog closes. You will make the tag connection later.
4. Select the individual object.
5. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
6. Enter a short, self-explanatory name for the individual object at the "Object Name" attribute.
7. Specify all static properties, e. g. colors or font attributes.
   You make the customized object dynamic in a separate step.
8. Click the title bar and select the command **Close** in the shortcut menu.
9. Repeat steps 2 to 7 for all the other individual objects.
10. Position the individual objects where they should appear in the customized object.
11. Using the mouse, drag a frame around all the individual objects.
    All individual objects are selected.
12. Select the menu command **Edit > Customized object > Create**.
    The "Customized Object" configuration dialog opens. In this dialog box, select all properties that should apply to the entire customized object.

See also

Creating a customized object for customized object template (Page 199)

10.4.5 How to configure a customized object

Procedure

1. Open the configuration dialog box for the customized object.
   - If you have created a new customized object, the configuration dialog box is automatically opened.
   - If you want to change the configuration subsequently, select the menu command **Edit > Customized object > Configuration dialog**.
2. Enter a descriptive name for the customized object in the "Object type" text field.
3. If you want to add additional properties in the "Selected properties" list, take the following steps:
   - Open the shortcut menu for any property and select the menu command **Theme Selection**.
   - Go to the "All Themes" list and select the theme that you want to add to the "Selected Themes" list.
   - Click the arrow button.
     The them is copied over.
   - Click "OK".
4. In the "Objects" list, select the object from which you want to copy properties for the customized object.
   The "Properties" list contains all properties that are always available for the selected object.
5. Using drag-and-drop, move the required property to the "Selected Properties" list below "User-defined".
   The property is inserted along with the corresponding object name. You can assign a specific value to this property later.

   Note

   If you add the "@" character in front of the attribute name, the property is rendered invisible in the "Object properties" dialog box. The property is still accessible via a script.
   You can find additional information about scripts in section "Global script function (Page 328)".

   Note

   If you use a "group display" in the customized object, you must define the following properties as properties for the customized object:
   - "Group value"
   - "Group relevant"

   This is required in order for statuses to be acquired and acknowledged.

6. Repeat steps 4 and 5 until you have defined all the properties for this new customized object.
7. Select the "Event" tab.

8. Go to the "Objects" list and select the object for which you want to specify an event.
   All events that can generally be used for the individual object are shown in the "Event" list.
9. Now use drag-and-drop to move the desired event to the "Selected Events" list below the associated entry, e.g. the "Mouse Action" event below the "Mouse" entry.
   You can connect this event later to a script, for example.
10. Repeat steps 7 through 9 if you want to define further events.

    Note

    Make sure not to define events simultaneously for the entire customized object and for individual objects. This can lead to overlaps in the execution of the event in process mode.

11. Click "OK".

10.4.6 How to configure the properties

Introduction

Once you have specified the properties for the customized object in the configuration dialog box, enter the values for these properties. You define only the dynamic properties in the configuration dialog. You have already defined the static properties for the individual objects.

Procedure

1. Select the customized object.
2. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
3. Select the "Customized Object" entry in the tree view.
4. Switch to the detail window and enter a descriptive name for the customized object at the "Object Name" attribute.
5. In the tree view, select the "User-defined" entry.
   You have stored all properties that you need for the customized object under this entry during configuration of the customized object.
6. Switch to the detail window and double-click in the "Dynamic" column for the desired attribute.
   A rectangle appears.
7. Enter the tag that is to be connected to the attribute here: Enter the tag name in a universally valid form: Place a dot before the tag name, e. g. ".PV_OUT".

8. Press the Enter key to accept your entry.
   The tag is transferred to the "Dynamic" column and the color of the "Bulb" symbol changes to green.
9. Repeat steps 5 to 8 to make the tag connection for all other attributes.

Note

Connect the "Group value" attribute to "[Name of block].EventState".

Enter "Yes" for the "Group Relevant" attribute.

10.4.7 How to store a customized object

Procedure

1. Open the Graphics Designer.
2. Open the "Library" dialog box ("Library" tab). If the "Library" dialog box ("Library" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Library" check box.
     The "Library" dialog box opens.
3. If you want to create many customized objects, select the "Project Library" object in the tree view, and click "New Directory". A new directory is created.
4. Select the newly created directory.
5. In the shortcut menu, select the menu command **Rename**.
6. Enter a meaningful name for the library.
7. In the process picture, select the customized object you want to store in the library and select the menu command **Edit > Copy**.
8. Switch to the library and, in the tree view, select the directory in which you want to store the customized object.
9. Click the "Paste" button in the library toolbar.
   The customized object is stored in the library.
10. In the shortcut menu for the customized object, select the menu command **Rename**.
11. Enter a meaningful name for the customized object. Use the same name that you used already as the object name in the properties of the customized object. This makes management of the customized objects more straightforward.

10.4.8 How to insert a customized object

Requirement

The "project library" contains the customized object.

Overview of the configuration steps

You insert the customized object in two steps:

Step	Action
1	Inserting the customized object in the process picture
2	Connecting the customized object to a specific block

Step 1: Inserting a customized object

1. Open the Graphics Designer.
2. Open the "Library" dialog box ("Library" tab). If the "Library" dialog box ("Library" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Library" check box.
   The "Library" dialog box opens.
3. In the tree view select the directory in which you have stored your customized objects.
4. In the detail view select the customized object that you want to insert in your process picture.
5. Click the "Copy" icon in the toolbar of the library.
6. Switch to the process picture and select the menu command **Edit > Paste**.
   The customized object is inserted in the process picture.

Step 2: Connecting the customized object to a block

1. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbar**
   – In the submenu, select the "Dynamic Wizard" check box.
   This "Dynamic Wizard" dialog box opens.
2. In the "Dynamic Wizard" dialog box, select the "Standard Dynamics" tab.
3. Double-click the entry "Link a prototype to a structure or rename an existing link".
   The wizard opens.
4. Click the "Next" button in the first step of the wizard.
   The "Set options" step is opened.
5. In the "Set options" step, click the "Browse" button next to the "Structure instance name" input box.
   The tag selection dialog box opens.

6. In the detail view, select the desired block and click "OK".
   The block is copied and the tag selection dialog is closed.

   Note

   If there are many tags, use the filter function in this dialog. You can find additional information about this in the online help for *WinCC Information System*.

7. Click "Next".
   The "Finished!" step opens.
8. Check your settings and click "Finish".
   In one step, the attributes of all properties are connected to a specific block.

10.4.9 How to edit a customized object

Introduction

If you want to change a customized object subsequently, proceed as follows.

Procedure

1. Open the process picture in the Graphics Designer and select the customized object.
2. Select the menu command **Edit > Customized Object > Edit...**.
   All individual objects are available for selection.

NOTICE
Never ungroup the customized object Do not ungroup the customized object under any circumstances, as all configurations would be lost in this case.

3. Click anywhere in the drawing pane.
   All selections are removed.
4. Select the individual object that you want to edit.
5. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
6. Change the desired properties.
7. Using the mouse, drag a frame around all of the individual objects.
   All individual objects are selected.
8. Select the menu command **Edit > Customized Object > Exit edit...**.
   Editing is now finished.

10.5 Working with customized object templates

10.5.1 Using and creating customized object templates

Customized object templates

Customized object templates are custom pictures in the Graphics Designer. You can create customized objects directly in these pictures or insert them into the customized object template from a library.

When you copy customized objects from the customized object template in process pictures, instances of the customized objects are generated. The instances can be updated **centrally**.

Comparison of customized objects and customized object templates

The following list compares customized objects and the customized object templates. Based on your requirements for an object, decide if you want to use a customized object or a customized object template.

Customized objects	Customized object templates
When you use a customized object from a library, you create a copy of the customized object. It is not possible to exchange these objects later.	When you use a customized object template, you create an instance. You can change the template centrally and then pass the changes to all objects that are based on this template.
You can only edit one customized object at a time and only directly in the process picture.	You can edit the properties of a customized object template quickly and conveniently in an external program, such as MS Excel.

Requirements for a central change

To be able to use the central editing function, the following requirements must be met:

- Each object that is based on a customized object template has a type identifier. You therefore define a "Type" property in the properties of the customized object template. This property is then passed to the instance of the customized object template. This property is used by the wizard to identifies these objects.
- The customized object templates are stored in a template file.

Recommendation:
You should insert custom block icons into customized object templates. Save the customized object templates in files with the naming convention @ PCS7Typicals<XYZ>.pdl. You can create a maximum of 20 template pictures in a project, for example @PCS7TypicalsVALVE.pdl; @PCS7TypicalsMOTOR.pdl.

10.5.2 Creating a customized object for customized object template

10.5.2.1 How to create a customized object template (example)

You can create customized objects that you can use, for example, to create your own block icons. To use your own picture as customized object template for your own block icons, the contained picture objects must have defined properties.

The block icons in template picture @PCS7TypicalsAPLV8.pdl, for example, can be used as templates for the customized objects. You should not change the default template pictures in PCS 7. These default template pictures are overwritten when the software is updated.

Required properties

You configure the relevant properties and attributes for the customized object.

If there is no object with suitable attributes in the customized object, you should add an additional object to the customized object.

Property	Required	Purpose	Additional objects (type)	Properties
type	… if all functions of the Graphic Object Update Wizard are to be used	This property is used as identification when working with the individual wizards of the Graphic Object Update Wizard.	DataSet	Data format: String
servername	… if a faceplate is to be called	This property refers to the faceplate that can be called by mouse click from this customized object.		Data format: String
tagname	… if a faceplate is to be called	This property assigns the designation of the instance with which the faceplate is to be called – this is the same as the variable prefix.		Data format: String
tag/ NameOfTag	no. Not mandatory and is also not supported by default.	This property is used to transfer fixed texts (E.g. code of the object). The entered character string can be displayed in the process picture.	I/O box	Data format: String

Recommendation

If you want to create your own reusable block icons from customized objects, proceed as follows:

1. Copy the standard block icons from the @PCS7TypicalsAPL<Version>.pdl template picture to the customized object template (your own template picture - e.g. @PCS7TypicalsVALVES.pdl).
   The functions of the standard block are then retained.
2. Adapt the block icons in the customized object template.

Basic procedure

1. Create additional objects
   If you create additional customized objects, you can reuse the objects you have created.
   You can find information about this in section "How to create additional required objects (Page 200)".
2. Expand customized object
   If there is no object with suitable properties in the customized object, add the objects with the required properties to the customized object.
   You can find information about this in section "How to add required objects to a customized object (Page 201)".
3. Parameterize customized object
   Enter the plant-specific properties for the customized object.
   You can find information about this in section "How to parameterize the customized object (Page 203)".
4. Save customized object
   Save the customized object in a picture.
   You can find information about this in section "Save (Page 203)".

10.5.2.2 How to create additional required objects

Procedure

1. Open the picture you have defined as the customized object template in the Graphics Designer (e.g. @PCS7TypicalsVALVES.pdl).
2. Add the "DataSet" object to the picture.
   Only create this object if there is no object of type "DataSet" in the customized object.
   The "DataSet Configuration" dialog box opens.
3. Click the "Add" button.
   A new entry is displayed in the list (name: Int<No>)
4. Select the entry in the "type" column. Select the "string" type from the drop-down list.
5. Click three times on the "Add" button.
   Three new entries are displayed in the list (name: String<No>)
6. Click "OK".
7. Add the "I/O field" object to the picture.
   Only create this object if a description of the customized object should be displayed in process mode. The "I/O Box Configuration" dialog box opens.
8. Click "OK".

9. Select the entered "I/O box" object.
10. Make the following settings for the following attributes in the "Object properties" dialog on the "Properties" tab:

Property > Attribute	Entry
I/O box > Object name	NameOfTag
I/O box > Other > Display	Yes
I/O box > Output/Input > Data format	String

10.5.2.3 How to add required objects to a customized object

Procedure

1. Select the customized object.
2. Select the menu command **Customized object > Edit...**.
   This step is not required if the required objects are contained in the customized object. You can find information about creating a customized object in section "How to create a customized object (Page 192)".
   – Copy the required additionally created objects (DataSet; I/O field) to the area of the customized object.
   – Adjust the size of the required additionally created objects.
   – Select the objects that belong to the new customized object (capture with "Lasso").
   – Select the menu command **Customized object > Exit...**.
   – In the shortcut menu, select the command **Configuration dialog**.
3. Enter a name for the object , e.g. "MotorSpecial", in the "Object type" field of the configuration dialog box.
4. Select the entry "Custom<...>" in the "Selected properties" column and rename it (e.g. "General"). You can enter any name.
5. Select the entry "DataSet1" in the "Objects" column.
6. Double-click on the following entries in the "Properties" column:
   – String0
   – String1
   – String2

   The properties are added to the "Selected properties" list in the renamed structured.
7. Select the properties on the table in the "Selected properties" list. Open the "Properties..." shortcut menu and change the entry files as shown in the table:

Selected property	Attribute name	Property name
String0	type	type
String1	tagname	tagname
String2	servername	servername

8. Select the entry "I/O box2>" in the "Objects" column.
9. Double-click on the following entries in the "Properties" column:
   - Display
   - Output format

   The properties are added to the "Selected properties" list in the renamed structure.
10. Select the properties on the table in the "Selected properties" list. Open the "Properties..." shortcut menu and change the entry files as shown in the table:

Selected property	Attribute name	Property name
Display	Visible1	Tag visible
Output value	tagname	NameOfTag

11. Select the properties of the other individual objects and repeat steps 9 to 10 for the properties you need for the customized object (e.g. "Group value", "Group relevant" or "Output value").
12. Click "OK".
    The added attributes are visible on the customized object in the selected properties.
    In the example: "General" property.

Note

Property name and attribute name

The "Property name" is shown on the customized object in the configured language. The attribute is registered in WinCC with the attribute name. The attribute can be used with the attribute name in actions (C actions and VBS actions), for example.

10.5.2.4 How to parameterize the customized object

Parameterize prepared customized object

1. Select the created customized object.
2. Select the "General" property from the tree structure.
3. Adapt the values for "Attribute" and "Static" as per the following table:

Value in the "Attribute" column	Adjusted value in the "Static" column	Example
type	Enter the AS block and the variant of the associated block icon. An entry must be structured as follows: <@<symbolic AS block>/<variant of the block icon> Note: The name of the AS block can be found in the component view in the block folder of the S7 program.	@MotL/MYONE
tagname	Note: This name is overwritten by the "Create/update faceplates" function.	Enter the following placeholder "tagname"
servername	Enter the name of the faceplate to be opened when you click on the block icon (customized object) in process mode.	PCS 7 MotL Control
tag	Example: Enter the following placeholder "tagname".	Enter the following placeholder "tagname".

10.5.2.5 Save

Procedure

1. Specify the following object properties:
   - Select the root node from the tree structure.
     Change the "Object name" attribute in the details and enter a name for the block icon.
   - Enter all the other user-defined properties in accordance with the project requirements.
2. Save the picture as the customized object template under a descriptive name.
   Read the following section "Rules for using multiple template files (Page 177)".

Additional information

You can save a customized object in a library.
You can find information about this in section "How to store a customized object (Page 195)".

10.5.3 Customized object templates and the Graphic Object Update Wizard

Graphic Object Update wizard

The "Graphic Object Update Wizard" is a generic term for various wizards at your disposal on the OS. In the wizard settings, you can specify whether the function should be executed only in the currently selected process picture or in all process pictures.

The following different wizards are available:

- "Picture object export (Page 204)"
- "Picture object import (Page 204)"
- "Updating picture objects (Page 206)"
- "Changing a tag connection (Page 207)"

10.5.4 Wizard for export and import of picture objects

Introduction

There is one wizard for exporting picture objects and one for importing picture objects:

- "Export Picture Objects" wizard
- "Import Picture Objects" wizard

"Export Picture Objects" wizard

The "Export picture objects" wizard exports the required information, such as object type or interconnection information, from customized objects to a CSV file. You can then edit this information in a spreadsheet application, such as MS Excel. For example, you can modify the interconnection of tags.

Select a configuration file for exporting the picture objects. You can customize this file.

"Import Picture Objects" wizard

The "Import Picture Objects" wizard imports information required to create customized objects in a process picture from a CSV file. In this process, **all** customized objects in the process picture and the template file are first deleted.
You usually run this function when you have started the "Export picture objects" wizard beforehand and have edited the export data in the CSV file.
The utilized OS tag names of the import files are not checked for validity or existence in the WinCC tag management.

The picture objects are imported with the same configuration file that you selected when exporting the picture objects.

Relationships when importing

Observe the following relationships when executing the import function:

If a customized object satisfies the following requirements:	… then the following actions are executed during the import:
• Present in the template file • Present in the process picture • Present in the CSV file	All customized objects in the process picture are first deleted All customized objects are then imported from the CSV file back to the process picture
• Present in the process picture • Present in the template file • Not present in the CSV file	All customized objects in the process picture are first deleted All customized objects are then imported from the CSV file again. Note that in this process, customized objects that have been deleted from the process picture but are not present in the CSV file are not reinserted.
• Not present in the template file • Present in the process picture • Present in the CSV file	Only the customized objects that are also actually present in the template file are deleted. If process picture contains customized objects that are not present in the template file, the import function is closed with an error message.

Note

Before executing the import function, be sure to make a backup copy of the process picture to avoid accidentally deleting customized objects from your process picture.

NOTICE
As block icons are designed as customized objects, they can be affected by the import function.

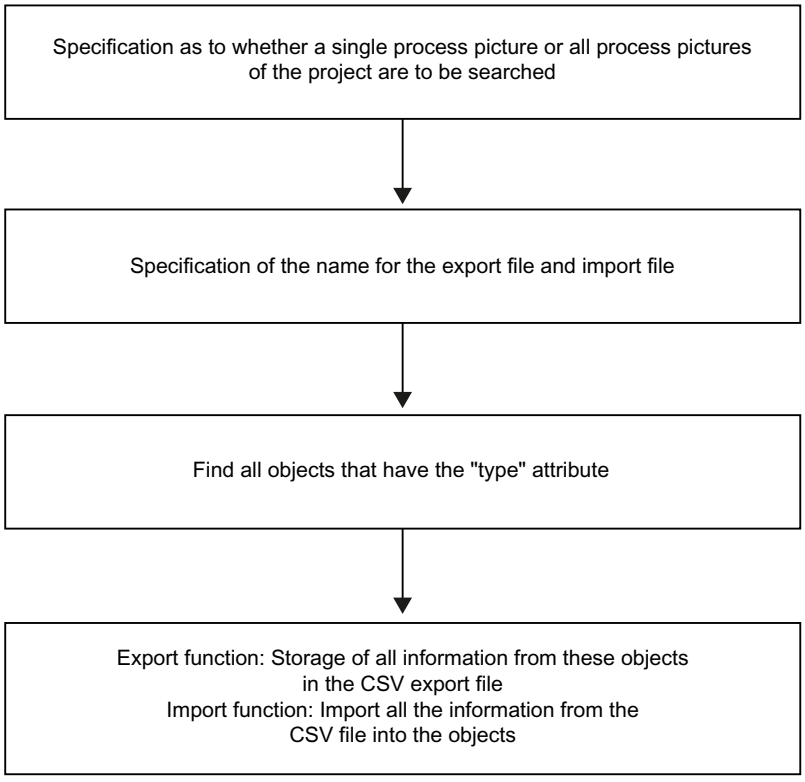
Additional information

You can find additional information about the import/export file and the configuration file in the online help for *WinCC Information System*.

10.5.5 Procedure for Importing and Exporting in the Graphic Object Update Wizard

Flow chart

In principle, the procedure for importing and exporting picture objects is identical:



Additional information

Additional information is available in the "Graphic Object Update Wizard" section of the *WinCC Information System* Online Help.

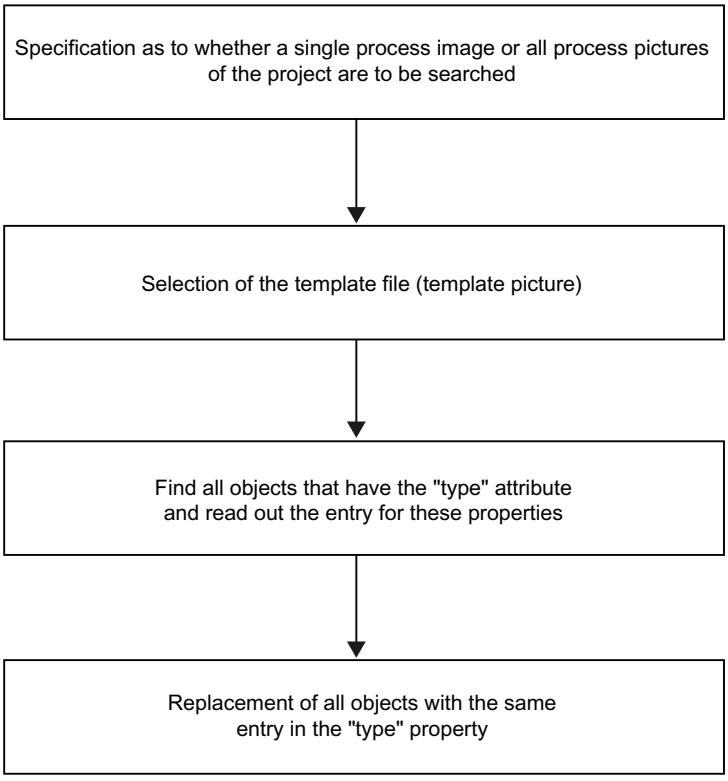
10.5.6 Wizard for Updating Picture Objects

Update the Picture Objects" wizard

If the export file requires no editing, you can use the "Graphic Object Update" wizard. Make a backup copy of the picture because the procedure cannot be reversed. Then open the respective picture in the Graphics Designer.

The "Graphic Object Update" wizard updates all instances of the customized object following a change to the central template.

Flow chart



10.5.7 Wizard for changing a tag connection

Wizard "Change a tag connection"

The "Change a tag connection" wizard is used for making subsequent changes to individual tag connections of instances of customized objects in process pictures, for example, an interconnection to another AS block instance.

You can use this wizard to change the dynamic connection to a customized object. In doing so, the instance name preceding the dot in the tag is replaced. Dynamics with internal tags are not affected by this.

10.5.8 How to create a customized object template

Note

To create a customized object template, you should already have experience with the Graphics Designer and the different objects in the object palette.

The following is a description of the basic procedure.

Procedure

1. Open a new picture in the Graphics Designer.
2. Insert at least one customized object into the picture.
   You can find information about this in section "Use and creation of customized objects (Page 190)".
   Steps for creation of customized objects:
   a. Create customized object
   b. Configure customized object
   c. Configure properties of customized object
3. Save the picture as a template file under a descriptive name.
   Read the following section "Rules for using multiple template files (Page 177)".

10.5.9 How to work with the Graphic Object Update wizard

Introduction

The wizards belonging to the "Graphic Object Update" wizard all function in the same way. For this reason, the following instructions present only a general description of how to work with these wizards.

Table 10-1 Overview of wizards

If you …	… then use the wizard
Want to update picture objects	"Updating picture objects" Specify the template file in the wizard where you have stored the modified customized object template. As a result, the customized object template can be replaced in a picture by the updated template.
Want to change interconnections	"Changing user object connection" In the wizard, specify the new structure type with which the customized object templates are to be interconnected in the picture.

If you …	… then use the wizard
Want to export picture objects	"Picture object export" Specify the following in the wizard: • Name of export file • Name of the configuration file: The configuration information is written from this file into the new configuration file. The new configuration file is assigned the same name as the export file. Generally speaking, the standard configuration file is indicated here. • "Splitting the tag name" option: This splits the tag name in accordance with the plant hierarchy, giving you a better overview and better editing options.
Want to import picture objects,	"Picture object import" Specify the following in the wizard: • Name of the import file • Name of the template file in which the customized object templates are stored. Bear in mind that the import file only contains data from objects that are also in the template file. Otherwise, an error message is issued.

Procedure

1. Make a backup copy of the process picture where you perform these functions because this procedure cannot be reversed.
2. Open the process picture in which you want to execute one of the following functions:
   – Update customized object
   – Export/import information from/to this customized object template
   – Exchange customized object interconnection
3. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – Select the "Dynamic Wizard" check box in the submenu.
     The "Dynamic Wizard" dialog box opens.
4. In the "Dynamic Wizard" dialog box, select the "Picture Functions" tab.
5. Double-click the required wizard. The table above contains a description of the wizards.
6. Click "Finish".
   The wizard is closed.

10.6 Using picture windows

10.6.1 Picture window

Introduction

Picture windows are a type of "container" inside a process picture. A picture window can accommodate a picture that you, for example, have created for a particular block and that you want to use several times at different points in the process visualization.

Using a picture window

You must first create pictures you want to use in a process picture as a "*.pdl" file. This PDL file contains only generally applicable specifications but no actual tag connections. You only prepare the tag connections in this picture: That is, the tags are represented using a universally valid name such as ".PV_IN" and thus have no specific instance name.

Picture windows can be displayed dynamically in the process picture via a command button and can be instanced dynamically during operation. This is done using global scripts.

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

10.6.2 How to use a picture window

Properties to be set

For picture windows, configure the following properties:

Property	Attributes	Content
Picture window	Object name	meaningful name for the picture window
Geometry	Window width	Width of the picture window which has to correspond to the width of the inserted picture
	Window height	Height of the picture window which has to correspond to the height of the inserted picture
Miscellaneous	Display	yes - this ensures that the picture window is always visible
	Picture name	Name of the picture that is to appear in the picture window, e.g. "controller.pdl"
	Tag prefix	Instance name of the tag preceding the dot, e. g. "RMT1/FC111/CTRL_PID"

Overview of the configuration steps

When using a picture window, proceed in two steps:

Step	Content
1	Creating the PDL file that is to be inserted into the picture window
2	Inserting the picture window in the process picture

Step 1: Creating the PDL file

1. Open the Graphics Designer.
2. Create the picture with all information you want to display for the technological block.
   - Insert all the static objects.
   - Insert all the dynamic objects.
   - Enter the tag name for the tag connection in the form ".PV_IN," adding a period in front of the tag name. **Under no circumstances** should you connect a tag to an actual block instance.
3. Save this picture as a PDL file under a short meaningful name.

Note

You can also use an existing customized object: This involves inserting the customized object into a new picture and saving it as a PDL file.

Step 2: Inserting the picture window in the process picture

1. Open the process picture in the Graphics Designer.
2. If the "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbars**
   - In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.
3. In the "Standard" dialog box, select the object "Picture Window" in the tree view in the "Smart Objects" folder.
4. Move the mouse pointer to the drawing area. Hold down the mouse button and draw a rectangle.
5. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
6. In the "Properties" tab, define the settings for the properties and attributes in accordance with the table above.
7. Click the title bar and select the command **Close** in the shortcut menu.

10.7 Working with cross-reference lists

10.7.1 General information about cross-reference lists

Cross-reference lists

Cross-reference lists provide a good overview of all tags you have used in your project.

Cross-reference lists also provide the following options for a PCS 7 project:

- You can view all locations of use for specific objects, such as tags and pictures, in a cross-reference list.
- You can delete a tag at a location by switching directly to that location in an object from the cross-reference list.
- You can modify the name of one or more tags via the "Link" function without causing inconsistencies in the configuration. You can also use this function to search for and replace character strings in tag names.

You use the WinCC "Cross Reference" editor to create or open an existing cross-reference list.

Location

The "Go to location" function initiates the following actions, depending on the origin of the tags:

Tag origin	Associated editor	Action when "Location" function Is executed
Archive	Tag Logging	Editor is launched No further action
Message	Alarm Logging	Editor is launched No further action
Function	Global Script	Editor is launched and function is displayed
Picture object	Graphics Designer	Editor is launched and object is selected in process picture
Tag	WinCC Explorer	Explorer is brought to the front No further action

Additional information

You can find information about the data window, the interface and the individual functions of the WinCC "Cross Reference" editor in the online help for *WinCC Information System*.

10.7.2 Using cross-reference lists

Using cross-reference lists

In the PCS 7 environment, a cross-reference list is important mainly as a way to check for detection of non-existent tags.

Each time the OS is configured, the tag management is automatically updated. Any tag no longer required, for example, because the CFC chart has been deleted, is automatically deleted in the tag management. The interconnections you made for dynamic objects in a process picture are retained. The interconnection, however, become invalid because the target of the tag connection to the CFC chart is deleted.

Note

Always compile the OS before working with a cross-reference list. This ensures that you are working with current data.

Cross-reference lists also display all tags from process pictures that are used as templates. These are all pictures with an "@" sign in front of the file name. You do not need to take these tags into account.

Non-existent tags

Non-existent tags can result from the following operations:

- In SIMATIC Manager, you deleted a CFC in the plant hierarchy with block instances that you have interconnected in the process picture.
- You have inserted a dynamic object or a customize object, for example, in a process picture, but you have not yet interconnected it with a tag.

Overview of the configuration steps

Follow the steps below when working with cross-reference lists in the PCS 7 environment:

Step	Content
1	Creating a cross-reference list (Page 214)
2	Going to a location (Page 215)
3	Performing corrections (Page 215)

10.7.3 Comparison of process object view and cross-reference lists

Introduction

Depending on the type of work you want to perform, the "Picture Objects" tab of the process object view, and the cross-reference lists offer you a variety of functions in WinCC.

You use the cross-reference list for the following tasks:

- You can view interconnections to non-existent tags.
- This WinCC function enables you to make corrections to the interconnections.

Process object view, "Picture objects" tab

You use "Picture objects" tab in the process object view for the following tasks:

- You can view picture interconnections for the entire plant or separately based on different plant units.
- In addition to picture interconnections, you will find the associated picture assignments here. This provides you with a good overview of missing or incorrectly configured picture objects.
- From the process object view, you can also access other information about the process tag, such as information about signals, messages and measured value archives.

10.7.4 How to create a cross-reference list

Procedure

1. Open WinCC Explorer.
2. In the WinCC Explorer tree view, select the "CrossReference" editor.
3. Open the shortcut menu and select the menu command **Open**.
   The "Cross Ref" dialog window opens.
4. Select the **File > New** menu command.
5. If data management has not been created yet in Cross Reference or is not up-to-date, a corresponding message is displayed.
   Click "Update".
   The update is started and the progress of the update is shown.
   After completion of the update, the "Edit filter" dialog box opens.
6. Define your filter settings:
   - Select the "Tags" entry from the drop-down list in the "Search for" group.
   - Select the "Used, not existing (not selectable)" check box in the "Search for" group.
   - Select all the check boxes in the "Search in" group.
7. Click "Start search".
   The data window opens and displays all tags that correspond to the specified filter criterion.
   The cross-reference list also displays all tags from the template pictures of which you have no need. These tags are identified with the "@" character prefixed to the tag name.
   You can find additional information about the data window and the individual columns in the online help for *WinCC Information System*.

8. Select the menu command **File > Save** in order to save the created cross-reference list.
   The "Save As" dialog box opens.
9. Enter a descriptive name.
   The file is displayed in the detail window of WinCC Explorer.
   You can open the file again at any time and change the filter conditions.

10.7.5 How to go to a location

Procedure

1. Open or create a cross-reference list in the WinCC "Cross Reference" editor.
2. Select the required "Containing Element" or the "Object" for which you want to see an application record, for example, the "Status Display" object.
3. Select the menu command **Edit > Go To** to find the associated location.
   - If you have selected an entry in the "Containing Element" column and execute the menu command, the Graphics Designer opens with the relevant process picture.
   - If you have selected an entry in the "Object" column and execute the menu command, the Graphics Designer opens with the relevant process picture, and the found object is automatically selected within the process picture.
4. Make any necessary corrections.

10.7.6 How to make corrections

Introduction

You can correct an incorrect tag connection in the following editors:

- In the Graphics Designer, you correct the tag connection using the tag selection dialog.
- In the "Cross Reference" editor, you use the "Link" function as described in the following.

Procedure

1. Open the cross-reference list in the "Cross Reference" editor.
2. Select the desired "Containing Element" or the "Object" for which you want to correct the interconnection.
3. Select the menu command **Edit > Link...**.
   The "Link" dialog box opens.
4. Click the "Browse" button beside the "Replace with" text field.
   The tag selection dialog opens.

5. Select the desired tag and click "OK".
   This tag is applied and the tag selection dialog is closed.
6. Click "Replace".
   The tag connection is changed.
7. Click "Close".
   The "Link" dialog box is closed. After the update of the cross-reference list, the tag is no longer indicated as "Used, not existing".

10.8 Using the Picture Tree Manager

10.8.1 Function of the Picture Tree Manager

Picture Tree Manager and plant hierarchy

The structure of the plant hierarchy is mapped in the Picture Tree Manager after you have compiled the OS. As a prerequisite, you must have activated this option in the settings for the plant hierarchy in SIMATIC Manager. The hierarchy levels you created in SIMATIC Manager are found in the Picture Tree Manager under the same name. For example, if you created a hierarchy level "Plant1" in SIMATIC Manager, you find the hierarchy level with the same name in the Picture Tree Manager. You can also see directly the picture stored in this hierarchy folder in the Picture Tree Manager.

In the bottom part of the Picture Tree Manager, you can find all pictures that are not inserted in the PH. In the PCS 7 environment, these are the pictures that you create additionally because, for example, you want to display them in a picture window in the process picture.

Requirements

In order for the structure of the plant hierarchy to be mapped in the Picture Tree Manager, certain requirements must be met:

- Only the hierarchy folders in which you inserted a picture are displayed in the Picture Tree Manager.
- A picture is inserted in the topmost hierarchy folder in each case. Otherwise, the lower-level hierarchy folders are not mapped.

When inserting pictures, bear in mind that you can insert only one picture per hierarchy folder.

NOTICE
Changes directly in the "Picture Tree Manager" editor Avoid making changes directly in the "Picture Tree Manager" editor in WinCC, such as insertion of additional hierarchy levels or additional containers and renaming of pictures. The data that you see in the Picture Tree Manager is transferred from the configuration data of SIMATIC Manager. Subsequent changes can be overwritten when the OS is recompiled if you have selected the "Derive picture hierarchy from the plant hierarchy" check box.

Picture Tree Manager and user rights

The hierarchy levels from the Picture Tree Manager are also available when user rights are assigned. In the following cases, you must change settings for user rights:

- After creation of new areas in the plant hierarchy in SIMATIC Manager or in the Picture Tree Manager
- After making a change to the hierarchy in the plant hierarchy in SIMATIC Manager or in the Picture Tree Manager

You must also specify new user rights for these new areas. Specify the user rights both on the OS server and on the OS client after import of server data.

10.8.2 Calculating the croup display hierarchy

Calculating the group display hierarchy

If you have inserted group displays into a process picture, the group display messages will not be displayed in the overview area or the process pictures in process mode until you have saved the plant hierarchy in the Picture Tree Manager. Activate the following options before saving the picture hierarchy in the Picture Tree Manager:

If ...	… then
You are calculating the group display hierarchy for the first time	Select the menu command **Options > Recalculate group display completely when saving**
You wish to update the group display hierarchy after changes	Select the menu command **Options > Delta saving**

If messages are still not displayed in the overview area in process mode, proceed as follows: Close WinCC Explorer and open it again.

On downloading or delta loading, the group display hierarchy is always recalculated irrespective of the activated options.

Message system settings 11

11.1 Overview of the message system

Introduction to the message system

If you use the "User-configurable message classes" function, read the information on this in the "Configuring the PCS 7 message system" section of the " *Process Control System PCS 7; Engineering System*" documentation.

The PCS 7 message system (alarm logging) is responsible for the following message processing functions in process mode:

- Receiving messages from processes
- Processing messages and displaying them in message lists in process mode
- Acknowledgments by the operator
- Archiving

In process mode, process messages and process control messages are displayed to the operator in the form of message lists:

Using the "Loop-in-alarm" function, the operator can quickly change from the message lists to the process picture in which the relevant process tag is displayed. The associated block icon is labeled clearly in the process picture.

The message system thus ensures the following:

- Detailed information about fault and operating states
- Early detection of critical situations

- Prevention and reduction of downtimes
- Increased product quality

incoming alarm list

	Date	Time	Priority	Source	Event	Status	Info
1	26/06/08	09:52:40.680	0	Plant1/REAC1/CFC_LI311/TANK_LEV_MON	Low Alarm	CG	
2	26/06/08	09:53:02.774	0	Plant1/REAC2/CFC_NR321/MOTOR	Monitoring Fault	C	
3	26/06/08	09:53:02.780	0	Plant1/REAC1/CFC_NR311/MOTOR	Monitoring Fault	C	
4	26/06/08	09:53:03.876	0	Plant1/REAC1/CFC_NK314/VALVE	Monitoring Fault	C	
5	26/06/08	09:53:03.877	0	Plant1/REAC1/CFC_NK315/VALVE	Monitoring Fault	C	
6	26/06/08	09:53:05.871	0	Plant1/REAC2/CFC_NK324/VALVE	Monitoring Fault	C	
7	26/06/08	09:53:05.872	0	Plant1/REAC2/CFC_NK325/VALVE	Monitoring Fault	C	
8	26/06/08	09:55:37.376	0	Plant1/REAC1/CFC_TC311/CTRL_TEMP	PV: Low Alarm	CG	
9	26/06/08	09:55:37.376	0	Plant1/REAC1/CFC_TC311/CTRL_TEMP	PV: LowLow Alarm	CG	
10	26/06/08	09:55:37.470	0	Plant1/REAC2/CFC_TC321/CTRL_TEMP	PV: Low Alarm	CG	
11	26/06/08	09:55:37.470	0	Plant1/REAC2/CFC_TC321/CTRL_TEMP	PV: LowLow Alarm	CG	
12	26/06/08	09:55:37.474	0	Plant1/REAC2/CFC_LI321/TANK_LEV_MON	HighHigh Alarm	CG	
13	26/06/08	09:55:37.474	0	Plant1/REAC2/CFC_LI321/TANK_LEV_MON	High Alarm	CG	
14	26/06/08	09:55:37.481	0	Plant1/REAC1/CFC_LI311/TANK_LEV_MON	HighHigh Alarm	CG	
15	26/06/08	09:55:37.481	0	Plant1/REAC1/CFC_LI311/TANK_LEV_MON	High Alarm	CG	
16	26/06/08	10:00:20.469	0	Plant1/RMT1/CFC_FC111/DOSE	Overdosed	CG	
17	26/06/08	10:00:21.082	0	Plant1/RMT1/CFC_LI111/LIA	HighHigh Alarm	CG	
18	26/06/08	10:00:21.082	0	Plant1/RMT1/CFC_LI111/LIA	High Alarm	CG	
19	26/06/08	10:00:40.669	0	Plant1/RMT2/CFC_FC112/Dose	Overdosed	CG	
20	26/06/08	10:00:41.284	0	Plant1/RMT2/CFC_LI112/LIA	HighHigh Alarm	C	
21	26/06/08	10:00:41.284	0	Plant1/RMT2/CFC_LI112/LIA	High Alarm	C	

Message lists

The plant operator can call up the message system in process mode by clicking a button in the keypad area. The plant operator can call up the message lists from there:

Message list	Display
Incoming list	Display of all unacknowledged messages
Acknowledged list	Display of all acknowledged messages that are still pending in the process
Outgoing list	Display of all messages that are marked as "Outgoing" and have not been acknowledged.
List of pending messages	Shows all acknowledged and unacknowledged messages that have not yet gone out
Operation list	Display of all the operator messages
Process control list	Display of all the process control messages, e.g. failure of a rack
History list	Display of all messages
List of hidden messages	Display of all messages that are hidden manually by the operator or automatically
List of messages to be hidden	Display of all messages that are pending and automatically hidden
Lock list	Display of all messages that are locked

Information units for a message

An individual message comprises different items of information. These individual items of information are referred to as message blocks, which can be divided into three areas:

Message block	Description
System block	System blocks contain system data that is assigned by Alarm Logging. Examples include date, time and identifier for logging. The contents of the system blocks are specified.
Process value block	Process value blocks contain values that are supplied from the process, e.g. critical levels or temperatures. You can adapt the contents of process value blocks individually.
User text block	User text blocks contain texts that contribute to general information and understanding, e.g. explanations of messages, fault location or cause of the message. You can adapt the contents of user text blocks individually.

Configuring the message system

You can find additional information about the settings for the message system in WinCC Explorer in the following sections:

- Settings for the message system in the OS Project Editor (Page 222)
- Settings for the message system in the "Alarm Logging" editor (Page 224)
- Settings for message lists in the Graphics Designer (Page 225)

Data you have configured in SIMATIC Manager is copied to WinCC Explorer when the OS is compiled.

11.2 Settings in the OS Project Editor

11.2.1 Settings for the message system in the OS Project Editor

Introduction

Basic message system settings for the display of the message system in process control are made automatically when creating the OS in SIMATIC Manager in the OS Project Editor. Accept these default settings.

Settings for PCS 7 projects in the "Message display" tab

The following settings should be set for PCS 7:

- Select the "Acknowledgeable messages in separate list" option so that the plant operator can acknowledge only the messages of the OS areas for which he is authorized in process mode.
- Select the "Show button for manual hiding" check box so that the plant operator can use the "Smart Alarm Hiding" function (manual hiding and showing of messages) in process control.
  Enter the desired time period for the manual hiding in the WinCC project of the OS Server.
- Select the "Create/update group display" check box to create or update group displays in process pictures and user diagnostic screens. These group displays are not visible in the process control.

You can find additional information about this in section "How to make message system settings in the OS Project Editor (Page 223)".

Changing basic settings in the "Message display" tab and in the "Message configuration" tab

You can change the basic settings for representing the message system in the process control.

You perform changes to the basic settings in the "Message Display" and "Message Configuration" tabs of the OS Project Editor.

You can make settings in the following groups of the "Message Display" tab:

- "Message filter"
- "Extended message line"
- "Authorization check of messages without a specified area"
- "Smart Alarm Hiding"
- "Sorting of message pages"
- "Group display hierarchy"
- "Operator input messages"

You can make settings in the following groups of the "Message Configuration" tab:

Activate the "Complete configuration" option in the "Activities when running the project editor" group of the "General" tab.

- "Column width of the message windows"
- "Message classes/types"
- "System messages"
- "Process control and operator input messages"

You can find additional information about the settings in the OS Project Editor in the "Message Configuration" tab in the online help for *WinCC Information System*.

11.2.2 How to make message system settings in the OS Project Editor

Procedure

1. In the WinCC Explorer tree view, select the "Project Editor".
2. Open the shortcut menu and select the menu command **Open**.
   The OS project editor opens.
3. Select the "Message display" tab.
4. Select, for example, the "Acknowledgeable messages in separate list" option in the "Message filter" group.
5. If, for example, you are using the "Smart Alarm Hiding (Page 240)" function, make the following settings in the "Smart Alarm Hiding" group:
   - Select the "Show button for manual hiding" check box. This activates the "Hide/show message" toolbar icon in the message lists in process control.
   - Enter the desired time period for the manual hiding in the OS Project Editor of the OS server.
6. Click "OK".

You can find further information about the settings in the OS Project Editor in the "Message Display" tab in the online help for *WinCC Information System* Online Help.

11.3 Settings in the "Alarm Logging" editor

11.3.1 Settings for the message system in the "Alarm Logging" editor

Data transferred from SIMATIC Manager

You have already entered any necessary special message texts in SIMATIC Manager in the block properties of a block instance in a CFC/SFC chart You have also made the AS-OS assignment in the plant view of SIMATIC Manager.

You can find additional information about configuring messages in SIMATIC Manager in section "Message Configuration (Page 83)".

The messages with the corresponding message texts are automatically applied in the "Alarm Logging" editor of the WinCC Explorer during the compiling of the OS.

You are not required to make any additional settings for the alarm logging functions in the "Alarm Logging" editor of the WinCC . All required settings have already been made in SIMATIC Manager and transferred to the OS during the compiling of the OS.

Changing the default settings for the message system in the "Alarm Logging" editor

If you want to make changes to the default settings, the "Alarm Logging" editor provides the following options:

- Layout settings of message blocks:
  Here you can further specify the basic settings you previously configured in the OS Project Editor.

  Note

  If the OS Project Editor is started with the "Complete configuration" setting, the settings are applied from the OS Project Editor

- Layout definition of the message classes:
  You can rename the message classes here. The colors for the message classes are set.
- Group messages:
  Here you can combine individual messages into group messages.

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

11.4 Settings for message lists

11.4.1 Settings for message lists in the Graphics Designer

Introduction

Message lists viewed by the plant operator in process mode have specific properties that can be changed as required:

- Message list sorting criteria
- Message block layout
- Message block selection
- etc.

When using the "User-configurable message classes" function, read the information in the section "Configuring the PCS 7 message system" in the manual "PCS 7 Engineering System".

Sorting criteria in message lists

Since you have already specified message priorities in the ES for the individual block types or block instances, you can use these message priorities as a sorting criterion for message lists.

You can find additional information about specifying message priorities in the *Process Control System PCS 7; Engineering System* manual.

Layout and selection of message blocks

Each message list is based on a PDL file created in the Graphics Designer. You can define properties for these pictures as required.

The following table shows the PDL file where the message lists are located.

Message list type	File name
One-line message in overview area	@AlarmOneLine.pdl
Highest priority messages	@AlarmEmergency.pdl
Acknowledgeable highest priority messages	@AlarmEmergencyOP.pdl
Incoming alarm list	@AlarmNew.pdl
Acknowledgeable incoming alarm list	@AlarmNewOp.pdl
Acknowledged alarm list	@AlarmOld.pdl
Acknowledgeable acknowledged alarm list	@AlarmOldOp.pdl
Outgoing alarm list	@AlarmGone.pdl
Acknowledgeable outgoing alarm list	@AlarmGoneOp.pdl
List of pending messages	@AlarmActive.PDL
Acknowledgeable list of pending messages	@AlarmActiveOp.PDL
Process control list	@AlarmProcess.pdl
Operation list	@AlarmOperation.pdl

Message list type	File name
History list	@AlarmJournal.pdl
List of hidden messages	@AlarmHidden.pdl
Acknowledgeable list of hidden messages	@AlarmHiddenOP.pdl
List of messages to be hidden	@AlarmHiding.pdl
Acknowledgeable list of messages to be hidden	@AlarmHidingOP.pdl
Lock list	@AlarmLocked.PDL

11.4.2 How to specify the properties for message lists

Procedure

1. Open the message list picture in the Graphics Designer.
2. Double-click in the picture.
   The "Properties of WinCC AlarmControl" dialog box opens.
3. Open the "Message lists" tab.
4. Click "Sort".
   The "Sort" dialog box opens.
5. In the "Sort by:" drop-down list, select the entry "Priority", for example.

   Note

   The "Priority" entry is only displayed if you have assigned the message number range explicitly for to the CPU.

   If you want to specify other sort criteria, you can make additional selections.

6. Activate the "Ascending" option.
   The message with the highest priority is shown in the first place.
7. If desired, specify additional sort criteria.
8. Go to the other tabs to specify the layout or the message blocks to be displayed.
9. Select the menu command **File > Save**.
   The file is saved with the modified settings.

System reaction

Repeated, unacknowledged messages

If messages enter and exit several times without having been acknowledged, the older messages are removed from the incoming alarm list and acknowledged automatically. However, the history list (archive) displays all messages.

The latest message requiring acknowledgment with the highest priority is displayed in the one-line message line of the overview area.

11.5 Using and configuring the horn

11.5.1 Function of the horn

Introduction

In addition to a visual representation of messages, certain messages might require an acoustic representation.

When using the "User-configurable message classes" function, read the information in the section "Configuring the PCS 7 message system" in the manual "PCS 7 Engineering System".

The "Horn" function

The OS offers the "Horn" function with the following options:

- You can connect a signal module with a PCI interface in the operator station.
  - You can use the signal module to control three visual or acoustic signal generators. You assign signal tags to these three signal generators in the WinCC "Horn" editor.
    You can find additional information about this in section "How to configure a horn (Page 233)"
  - The signal generator is acknowledged/reset via the software control or by an external acknowledgment at the signal module.
  - A group signal at the signal module is also available.
    The group signal is triggered when one of the three signal generators is activated.
  - Connection of a signal module also provides lifebeat monitoring with the watchdog function.
- You can use a standard sound card installed in the operator station.
  - The acoustic signal is produced by a WAV file, which continues to be played until the message is acknowledged. You can specify the maximum number of WAV files that can be played simultaneously.
  - Lifebeat monitoring cannot be implemented with a sound card.

It is possible to combine signal modules and sound cards.

You configure the horn in the "Horn" editor.

Additional information

- You can find additional information in the following sections:
- You can find additional information in the online help for *WinCC Information System*.

11.5.2 Operating principle of signal tags

Introduction

An incoming message activates a signal tag that triggers an acoustic or optical signal on the assigned signal generator.

The "Horn" editor allows you to configure which signals should be triggered when certain messages arrive.

Behavior in process mode

The principle in process mode is as follows:

An incoming message that corresponds to the configured message properties and configured authorization triggers a signal tag. The signal tag "1" is then set. The signaling is performed by a signal module and/or a *.wav file, if a sound card is available.

Additional information

- You can find additional information in section "Settings in the "Horn" editor (Page 229)".
- You can find additional information in the online help for *WinCC Information System*.

11.5.3 Acknowledgment of signals

Introduction

The horn can be acknowledged by the plant operator in process mode separately for a PC station or in a coordinated manner for several PC stations using the "Acknowledge Horn" horn acknowledgment button. The associated message is not acknowledged.

The horn is acknowledged without verification of the authorization.

When the respective message that triggered an acoustic signal is acknowledged, the associated signal tag is set to "0" and the horn signal is acknowledged at the same time.

You have the following options for acknowledging the horn signal:

- Local horn acknowledgment
- Multiple horn acknowledgment via a group

Local horn acknowledgment

The horn is acknowledged on a separate, independently operating PC station via the "@HornReset" tag. If an operator acknowledges the horn, the acknowledgement tags and hence all signal tags are reset. The signal generators are disabled.

Multiple horn acknowledgment via a group

If you want to acknowledge the same horn from different operator stations, these operator stations must belong to the same acknowledgement group. In the "Horn" editor, you assign the group to the horn (e.g. Meld1).

All operator stations belonging to an acknowledgement group must be connected to the same Ethernet bus.

Additional information

- You can find additional information in section "Detail areas for the "Signal assignment" hierarchy folder (Page 231)".
- You can find additional information in the online help for *WinCC Information System*.

11.5.4 Settings in the "Horn" editor

Settings in the "Horn" editor

In the "Horn" editor, you can configure horns within various hierarchy folders.

The following table shows the hierarchy folders with their detail areas.

Hierarchy folder	Detail area
Message assignment	Message assignment • Select a message class. • Select a message tag. • Assign filter criteria to the message tag.
	Properties - Settings Specify the message status for which the signal tag is to be set and the horn triggered.
Signal assignment	Signal assignment • Select a signal tag. • Assign the signal tag to a physical output of a signal module and/or a WAV file.
	Properties - Settings Define the reaction when acknowledging and playing sounds.

Additional information

You can find additional information about this in sections:

- "Detail areas for the "Message assignment" hierarchy folder (Page 230)"
- "Detail areas for the "Signal assignment" hierarchy folder (Page 231)"

11.5.5 Detail areas for the "Message assignment" hierarchy folder

Introduction

In the "Message Assignment" detail area, select the signal tags to be connected to the properties of messages which serve as filters.

The signal tags are internal WinCC tags that control the physical outputs of the horn.

For an incoming message that meets the filter criteria, the assigned signal tag is set to "1". The same signal tag can be controlled by different message properties.

You also define the access rights for the individual message tags for which the message tags are triggered.

You specify the general message settings in the detail area "Properties - Settings".

"Message assignment" detail area

The following table provides an overview of the message properties.

The following settings influence when the signal tags are activated for the horn.

Filter criteria	Action
Message class	Select the message class from the drop-down list.
Priority	Specify the desired message priority that should activate the tag. Enter a number between 0 and 16. You can find additional information about this in section "Message priorities (Page 88)".
Origin	Select the origin from the drop-down list. You can use wildcard characters in the filter text. All text is included when the line is empty.
Area	Select an area from the drop-down list.
Event	Specify the filter properties. You can use wild card characters. All text is included when the line is empty.
Authorization	You can select various authorizations for the activation of signal tags: • Default Authorization check for "Authorization for area" • Any other authorization that is entered in the "User Administrator" editor in WinCC. Authorization check for specified authorization and for "Authorization for area"

"Message assignment" detail area - an example

The following table shows an example of a minimal configuration for a message assignment.

Message class	Priority	Origin	Area	Event	Authorization	Message tag
Alarm					<Default>	alarm_horn
Tolerance					<Default>	tolerance_horn
AS process control message					<Default>	system_horn

"Properties - Settings" detail area

The following table shows the possible message settings.

Message settings	Description
Default authorization check for "Authorization for area"	You can disable the preset authorization check for "Authorization for area". If you disable the default authorization check, only the configured authorization is considered in addition to the filter criteria for triggering the signals during process control. There is no longer an "Authorization for area" check beside the configured authorization level. The authorization levels are specified in the "User Administrator" editor in WinCC.
Set tag	In the "Set tag:" group, you specify the message status for which the signal tag is set and the horn triggered.

Chatter messages

Chatter messages are messages that come and go constantly at short notice and are thus able to generate an unwelcome surge of messages. This is often due to chattering contacts in the system.

In the "Set Tag" group, you can activate the "Not on receipt of an unacknowledged message" option to suppress these chatter messages. When this option button is selected, these messages are triggered only once. They can be retriggered only after acknowledgment.

Additional information

You can find additional information in the online help for *WinCC Information System*.

11.5.6 Detail areas for the "Signal assignment" hierarchy folder

Introduction

You configure the "Signal assignment" detail area and the "Properties - Settings" in the WinCC project of the PC station (OS client, OS server) where the signal module and/or WAV file is triggered.

"Signal assignment" detail area

You must assign an output of the signal module and/or a WAV file to each signal tag. The signal is triggered as soon as the assigned signal tag is set to "1".

You can trigger a signal module and a WAV file simultaneously. Furthermore, you can assign different signal tags to an output of the signal module.

You can set a specific order for the signal tags:
A message can only set a single signal tag. If the message fulfills the conditions of several signal tags, the WAV file is only triggered for the signal tag in the top row of the table. You can change the order of the signal tags using the arrow buttons. This order has no effect on the behavior of the signal modules.

"Signal assignment" - an example

The following table shows an example configuration.

Signal tag	Signal Module	Sound "(WAV File)"
horn_1	Output 1	alarm.wav
horn_2	Output 2	warning.wav
horn_3	Output 3	tolerance.wav

"Properties - Settings" detail area

The following table shows the possible signal settings.

Signal settings	Description
Acknowledgment tag	This is where you specify the acknowledgment behavior for all signal tags. You can find additional information about this in section "Acknowledgment of signals (Page 228)".
Multiple acknowledgment via the following acknowledgment tags:	
Multiple acknowledgment in the following group:	The preferred configuration is multiple acknowledgment via a group. Multiple acknowledgment via acknowledgment tags has been retained for compatibility reasons.
Play sounds	This is where you specify how many sounds can be played simultaneously.
Number of simultaneously played sounds	

Additional information

You can find additional information in the online help for *WinCC Information System*.

11.5.7 How to configure a horn

Procedure - Opening the "Horn" editor

1. In the WinCC Explorer tree view, select the "Horn" editor.
2. Open the shortcut menu (right-click) and select the menu command **Open**.
   The "Horn Configuration" dialog box opens.

Procedure - "Message assignment" hierarchy folder

1. Select the "Message assignment" hierarchy folder in the tree view.
2. Switch to the "Message assignment" detail area.
3. Specify the message tags and filter criteria in the table.
   - "Message class" cell
     Select the message class from the drop-down list.
   - "Priority" cell
     Enter the priority in the input box.
   - "Origin" cell
     Select an origin.
   - "Area" cell
     Select the area from the drop-down list.
   - "Event" cell
     Enter the event in the input box.
   - Additional cells
     You can display the cells "Free 1" - "Free 5" via the table header in the details area.
     Enter the filter criterion in the text field.
   - "Authorization" cell
     Select the authorization from the drop-down list.
   - "Tag" cell
     Select the message tag.
4. Select the "Message assignment" hierarchy folder in the tree view.

5. Switch to the "Properties - Settings" detail area.
6. In the "Message settings" hierarchy folder, select the message status that will set the signal tag.
   - In the "Set tag" line, select "Not for incoming messages without acknowledgment" from the drop-down list to suppress chatter messages.
   - In the "Set tag" line, select "For every incoming message" from the drop-down list if you do not want to suppress chatter messages.
   - If you want to perform an authorization check for "Authorization for area", clear the check box in the following line:
     Disable default authorization check "Authorization for area"
   - If you want to perform an authorization check for "Authorization for area", select the check box in the following line:
     Disable default authorization check "Authorization for area"

Procedure - "Signal assignment" hierarchy folder

1. Select the "Signal assignment" hierarchy folder in the tree view.
2. Switch to the "Signal assignment" detail area.
3. Specify the assignment of the signal tag to the signal modules and/or sound files in the table:
   - "Signal tag" cell:
     Select the signal tag that should trigger an acoustic or optical signal on the assigned signal generator.
   - "Signal module" cell:
     Select the desired output of the signal module from the drop-down list.
   - "Sound" cell:
     Requirement: The sound card is installed.
     Select the desired WAV file.
4. Select the "Signal assignment" hierarchy folder in the tree view.
5. Switch to the "Properties - Settings" detail area.

6. Set the type of acknowledgment for all signals in the "Signal settings" hierarchy folder.
   - If you want to perform local acknowledgment, select the "Local only" from the drop-down list in the "Acknowledgment tags" line.
   - If you want to acknowledge several horns simultaneously through a tag, select "Multiple acknowledgment using tags" from the drop down list in the "Acknowledgment tags" line. In the "Multiple acknowledgment using the following acknowledgment tags:" area, select the desired acknowledgment tag.
     If you want to acknowledge several horns in a group simultaneously, select "Multiple acknowledgment in group" from the drop-down list in the "Acknowledgment tag" line. Enter the same group name in the "Multiple acknowledgment in the following group:" area in every WinCC project of the respective PC station.
7. Set the sound for the horn in the "Signal settings" hierarchy folder.
   - If several messages are pending at the same time and all sounds are to be played simultaneously, select "Play all sounds simultaneously" from the drop-down list in the "Play sounds" line.
   - If several messages are pending at the same time and all sounds should not be played simultaneously, select "Limit number of simultaneously playing sounds" in drop-down list in the "Play sounds" line.
     Enter a number in the text field of the "Number of simultaneously playing sounds:" line. The order of the entries in the Sound column determines which sound is played.

Additional information

- You can find additional information in sections
  "Detail areas for the "Message assignment" hierarchy folder (Page 230)"
  "Detail areas for the "Signal assignment" hierarchy folder (Page 231)"
- You can find additional information in the online help for *WinCC Information System*.

11.5.8 Example configurations

Overview of example configurations

The following examples shows you how horns can be used:

- OS client with signal generator (Page 236)
- OS client with multiple acknowledgment in a group (Page 236)
- OS server with signal generator (Page 237)

11.5.9 OS client with signal generator

Introduction

The next example describes the configuration of OS clients with signal generator in an OS multiple station system.

Requirements

- Each OS client is in a separate room.
- Each OS client has a signal generator.
- OS server has no signal generator.

Prompt

When an OS client receives a message, a signal is triggered or acknowledged independent of the other OS clients. This has no effect on the other OS clients.

Procedure

1. Configure the message and signal assignment in the WinCC "Horn" editor.
2. Select "Local only" from the drop-down list of the "Acknowledgement tag" line in the "Signal assignment" hierarchy folder of the "Properties - Settings" detail area.

Behavior in the process control

The signal generators of the individual OS clients are triggered by a message independent of one another. Each OS client acknowledges its signal generator. Its own signal tag is reset and the signal is deactivated.

11.5.10 OS clients with multiple acknowledgment in a group

Introduction

The following example describes the configuration of two OS clients with a signal generator in an OS multi-user system in a group.

Requirements

- Each OS client is in a separate room.
- Each OS client has a signal generator.
- OS server has no signal generator.

Prompt

The signal generators of all OS clients in a group are acknowledged by an acknowledgment from one OS client.

Procedure

1. Configure the message and signal assignment for both OS clients in the WinCC "Horn" editor.
2. In the detail area "Properties - Settings" in the "Signal assignment" hierarchy folder, select "Multiple acknowledgment in group" from the drop-down list in the "Acknowledgment tag" line in the "Signal settings" hierarchy folder.
3. Enter the same group name each time, for example, "GROUP1", in the input box in the "Multiple acknowledgment in group" line.

Behavior in the process control

The signal generators of the individual OS clients are triggered by a message independent of one another. When the signal generator is acknowledged on one OS client, the signal generator of the other OS client is acknowledged at the same time. The signal tag is reset and the signal deactivated on each OS client.

Note

When configuring a shared acknowledgment, be aware that users with different authorization levels can be logged on to the OS clients. When a message arrives that triggers the signal generator, for example, the user on OS client 1 can see this message as a result of his authorization level. The user on OS client 2 does not have the appropriate level of authorization to view the message, although he can acknowledge the signal generator on OS client 2.

11.5.11 OS server with signal generator

Introduction

The following example describes the configuration of OS servers with signal generators in an OS multi-user system.

Requirements

- The OS server has a signal generator.
- OS clients have no signal generator.

Prompt

When an OS client receives a message, the message is displayed independent of the other OS clients. The signal generator on the OS server is triggered. The signal generator can be acknowledged on every OS.

Procedure

1. Configure the signal assignment on each OS client in the WinCC "Horn" editor.
2. Enter the signal tag with a server prefix in the "Signal tag" column of the table in the "Signal assignment" hierarchy folder of the "Signal assignment" detail area, because the signal tag must be created on the OS server.
3. Select "Multiple acknowledgment in the following group" from the drop-down list of the "Acknowledgement tag" line in the "Signal settings" hierarchy folder of the "Properties - Settings" detail area.
4. Enter the same group name, e.g. "GROUP1", in the text field in each case in the "Multiple acknowledgment in the following group:" line.
5. Configure the signal assignment on the OS server in the WinCC "Horn" editor.
6. Select "Multiple acknowledgment in the following group" from the drop-down list of the "Acknowledgement tag" line in the "Signal settings" hierarchy folder of the "Properties - Settings" detail area.
7. Enter the same group name, e.g. "GROUP1", in the text field in each case in the "Multiple acknowledgment in the following group:" line.

Behavior in the process control

The signal generator of the OS server is triggered by the message on the OS client. Each OS client and OS server can acknowledge the signal generator. The signal tag on the OS server is reset and the signal deactivated

Note

When configuring a shared acknowledgment, be aware that users with different authorization levels can be logged on to the OS clients. When a message arrives that triggers the signal generator, for example, the user on OS client 1 can see this message as a result of his authorization level. The user on OS client 2 does not have the appropriate level of authorization to view the message, although he can acknowledge the signal generator on OS client 2.

11.6 Locking/unlocking or displaying/hiding messages

11.6.1 Locking and unlocking messages

Locking and unlocking messages for blocks and OS areas

The "Lock/unlock messages" function for individual message-capable blocks and all message-capable blocks in an OS area is used when the plant operator wants to lock or unlock all messages of a message-capable block or all messages of all message-capable blocks in an OS area.

Messages generated at locked blocks in the automation system are neither displayed nor archived in group displays in the process control.

The disable operation performed by the operator is recorded in the operator activities log.

The status of the disabled messages is visualized in the group display and in the overview area using the group display hierarchy.

Example applications:

- You want to put a process tag into operation.
- A hardware error causes messages you wish to suppress in process mode.

No configurations are required for unlocking and locking messages.

Additional information

You can find additional information about locking messages in process mode in the *Process Control System PCS 7; OS Process Control* manual.

11.6.2 Hiding and showing messages

Hiding and showing messages

You hide individual messages to reduce the number of messages displayed in process mode.

Options for hiding messages

The following options are provided for hiding messages:

- Manual hiding and showing of messages in process mode
  You can find additional information about this in this manual in section: "Manual hiding and showing of messages in process mode (Page 240)
- Automatic hiding and showing of messages in process mode
  You can find additional information about this in the *Process Control System PCS 7; Engineering System* manual.

Behavior in process mode

- In process mode, you can hide messages in the following lists:
  - Incoming alarm list
  - Acknowledged alarm list
  - Outgoing alarm list
- Pending hidden messages are displayed in the "List of hidden messages".
- Hidden pending messages can be shown again in the incoming alarm list, acknowledged alarm list and outgoing alarm list using the "List of hidden messages".
- Hidden non-pending messages can be shown using the "List of messages to be hidden".
- Hidden messages are archived.
- In the case of redundant operator stations, message archive synchronization is performed.
- In the case of hidden messages, the acoustic signal (horn) is suppressed.
- The status of hidden messages does not appear in the group displays of the process pictures and faceplates.
- When a message is hidden in process control, a message is generated in the operation list that the message has been hidden.
  When a message is shown in process control, a message is generated in the operation list that the message has been shown.

11.6.3 Manual hiding and showing of messages in process mode

Requirements

- The "Show button for manual hiding" check box for the "Smart Alarm Hiding" function is activated in the "Message display" tab of the "OS Project Editor" in the WinCC project of each OS.
- The period of manual hiding is set in the "Message display" tab of the OS Project Editor in the WinCC project of the OS server. The basic time setting is 30 minutes.
  Tip: You can modify this setting in process mode if the OS and ES are operated on a single PC station.

Note

The requirement for using the "Smart alarm hiding" function in process mode must be fulfilled for each operator station that uses this function. The "Smart Alarm Hiding" function corresponds with the "Manual hiding of messages" function.

"Manual hiding of messages" button

When the requirements are met, the "Manual Hiding of Messages" button is available to the plant operator in the toolbar in process mode in the following message lists:

- Incoming alarm list
- Acknowledged alarm list
- Outgoing alarm list
- List of hidden messages
- List of messages to hide

You do not need to make any other settings in order to be able to hide messages manually.

Manual showing of hidden messages

Hidden messages can be shown again in process mode as follows:

- Automatically
  - after the period set in the OS Project Editor has expired
  - after the process has changed to a configured status.
- Manually
  By the operator: Selection of the message from one of the following lists:
  - "List of hidden messages"
  - "List of message to be hidden", and then clicking "Show/hide messages".

Additional information

- Section "How to make message system settings in the OS Project Editor (Page 223)"
- *Process Control System PCS 7; OS Process Control* manual
- *Process Control System PCS 7; Engineering System* manual

Configuring the archiving 12

12.1 Archiving in PCS 7

Introduction

In a PCS 7 system, you can archive various types of data that is produced in process mode. This data includes measured values and messages.

A variety of functions are available for archiving process values (e.g. measured values, messages) with PCS 7:

- Archiving on the operator station
  The operator station saves measured values and messages in archives for long-term availability of the data.
- Archiving on a Process Historian (external archive server)
  The Process Historian can be used on a separate PC station to archive these process values.

Identifying process values for archiving

PCS 7 provides the option of automatically creating archive tags for process values marked accordingly. To do this, you must label these process values as relevant for archiving in SIMATIC Manager using the "Archive" attribute. You can only set this attribute for block I/Os intended for operator control and monitoring. If you have selected the appropriate option, PCS 7 automatically creates the required archive tags when the OS is compiled.

You can find additional information about this in section "Defining archive tags (Page 81)".

Configuration of the OS for archiving

When using the Process Historian, the following property must be configured on each operator station from which values are to be archived:

The "Transfer to external archive server" check box is selected in the "Properties - OS – <name of the OS>" dialog box of the SIMATIC Manager.

- For OS servers: in the "Target OS" tab
- For redundant OS servers: in the "Target OS and Standby OS" tab

Sequence of archiving

By default, archiving is performed locally on the various OS servers.

If you also use a Process Historian, additional archiving routines are performed centrally on this Process Historian.

The local archives of OS servers are configured as short-term archives: When the archive has reached capacity limits, the oldest values are deleted to release space for saving new values. This corresponds with "FIFO" (First-in first-out) principle.

If the Process Historian is not available for a certain period of time, the OS server will attempt to export at a later point in time. As long as the data is still in the short-term archive, this remains possible without loss of data.

Evaluation of the archived data

The Information Server (IS) is the central reporting system that provides the stored archive data of the Process Historian independent of the PCS 7 Runtime systems.

12.2 Editors for the archive configuration

Introduction

In PCS 7 there are two different types of archives that you configure in different editors:

- Archives for process values with the " Tag Logging" editor
- Message archive for messages and alarms with the "Alarm Logging" editor

Archive for process values

Archive tags are stored in the "SystemArchive". PCS 7 creates this archive automatically the first time you compile the OS with the "Archive tags" option. The system archive is configured in the "Tag Logging" editor.

A distinction is made between the archive types Tag Logging Slow and Tag Logging Fast:

- The Tag Logging Fast archive type is used by default for acquisition cycles of less than or equal to one minute.
  The default value of one minute can be changed manually in the "Tag Logging" editor via the archive configuration of the "Tag Logging Fast" archive type.
- The Tag Logging Slow archive type is used when the acquisition cycle is longer than one minute.

In the "Tag Logging" editor you can also use the **Link archive** command in the shortcut menu to access archives that are located elsewhere.

You can also create additional archives for process values in the "Tag Logging" editor.

Archive for messages and alarms

Alarms and messages are stored in the "Message archive". You configure this archive in the "Alarm Logging" editor.

Note

You only have to change the configuration in the "Tag Logging" and "Alarm Logging" editors if you want to adapt the default settings for archives made automatically by PCS 7 to the specific requirements of your project.

In the "Alarm Logging" editor you can also use the **Link archive** command in the shortcut menu to access archives that are located elsewhere.

Additional information

- Section "Additional archives in the "Tag Logging" (Page 255) editor
- Online help for *WinCC Information System*

12.3 Configuring archives on an OS server

Configuring archives on an OS server

To understand the archives, the following terms are important:

- Segment: The individual values are initially grouped to form small units, namely the segments.
- Overall archive: All the single segments form the overall archive.

Parameter

When configuring the archive, you set various parameters for the single segments and the overall archive. You can find information about the calculation in section: "Calculating the storage space and number of single segments (Page 253)"

Parameter	Meaning
Max. size	• Recommended size of a single segment: maximum 2 GB • When the specified size for a single segment is reached, a new single segment is opened. • When the specified size of all single segments forming the entire archive is reached, the oldest single segment is deleted.
Time period	• When the specified time period for a single segment is reached, a new single segment is opened. • When the specified time period for all single segments forming the entire archive is reached, the oldest single segment is deleted.
Number of single segments	• Recommendation: maximum of 200

Note

Since you must make the archive type settings for each OS server, remember the following:

Configure approximately the same time periods for the single segments.

You must also define the timing for the segment change. When this value is reached, a single segment is closed regardless of whether the specified size or specified time period has been reached.

Note

Note the following for non-redundant OS servers:

If you want a new single segment to be opened when process mode starts, set the timing of the segment change before the start of process mode.

To store the archive data, you also specify the backup parameters. A backup is started shortly after a segment change.

Configuring the archiving routines for a Process Historian

If you use a Process Historian for archiving, you need to make additional parameter settings for the archiving routines on the Process Historian.

Note

Relationships and rules must be taken into account for the configuration of the archives on an OS server and the configuration of the archiving routines on the Process Historian.

You can find a detailed description of the rules in section "Rules for archive configuration (Page 261)".

Additional information

- Online help for *WinCC Information System*

12.4 Backup configuration

Introduction

To ensure complete documentation of archive data with no gaps, you create backups for your archive data.

You configure the backups on the "Backup configuration" tab of the "Tag Logging" editor in WinCC Explorer.

On the "Backup configuration" tag you enter the path to the backup medium.
The path details can be local to the computer or specified as a network path.

Settings for the backup configuration

You can set two export paths:

- Destination path
- Alternative destination path

The entry in the "Destination path" input box defines the path to the backup medium on which the archive data are stored.

The entry in the "Alternative destination path" input box defines the alternative destination path to the backup medium.

The alternative destination path is used if, for example, the storage capacity of a backup medium is fully occupied.

If you activate the "Backup on both paths" check box, the backup data will be saved on both backup media.

Note

In a plant configuration with a Process Historian, you do not define any path settings for the destination path and alternative destination path. The paths are automatically set after the destination OS has been set.

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

12.5 How to configure the archives in the "Tag Logging" editor

Requirement

The "Tag Logging" editor is open.

Procedure

Note

Configure the two types of archives one after the other.

1. Select the "Archives" hierarchy folder.
2. In the shortcut menu, select the command **Archive Configuration > "Archive type" > Properties**.
   The "TagLogging Fast" or "TagLogging Slow" dialog box opens.
3. Set the archive parameters.
4. Select the "Backup Configuration" tab.
5. If you are using a Process Historian, you need not make any entries in the "Backup Configuration" tab.
   Check that the following condition is met and proceed to step 7.
   Requirement:
   The "Transfer to external archive server" check box is selected in the "Properties - OS – <name of the OS>" dialog box of the SIMATIC Manager.
   - For OS servers and ES/OS single station systems: in the "Target OS" tab
   - For redundant OS servers and ES/OS single station systems: in the "Target OS and Standby OS" tab
   - Also assign the external archive server in an ES/OS single-user system.
     Click the "Assign archive server" button.
     Assign the Process Historian.
6. If you do not use a Process Historian and you want to back up your archive data, perform the following configurations:
   - Select the "Activate Backup" check box.
   - Enter the destination path of the location where you want to store the backup data.
     Click "Browse" next to the "Destination Path" box and select the directory in which the archive backup is to be saved.
   - If required, select an alternative destination path.
     If the archives cannot be backed up in the default destination path, they are automatically backed up to the alternative destination path.
   - If you want to perform a double backup, select the "Backup on both paths" check box.
7. Click "OK".
   The settings for your archive are complete.

12.6 How to configure the message archive in the "Alarm Logging" editor

Requirement

The "Alarm Logging" editor is open.

Procedure

1. Select the "Messages" hierarchy folder.
2. In the shortcut menu, select the menu command **Archive configuration > Properties**.
   The "Alarm Logging" dialog box opens.
3. Perform steps 3 to 7 as described in the section "How to configure the archives in the "Tag Logging" editor (Page 249)".

12.7 Determining the archive storage capacity requirements

Introduction

If you want to assess how long you can continue to access the archives on an OS server or the archive values on a Process Historian without having to resort to archives in other locations, you need to determine the storage capacity requirements.

You can increase the storage capacity by adding additional hard disks.

The storage capacity requirements are determined by the total storage space required to archive the areas concerned:

- Space required for the TagLogging Fast archive type
- Space required for the TagLogging Slow archive type
- Space required for the "Message Archive" archive type
- Space required for the "OS and Batch reports" archive types

The guide values given below may differ from those actually encountered within the context of operation.

Space required by individual measured values and messages for archive types

The space required for an archive depends on the archiving settings, the data type and the time behavior of the values to be archived.

- TagLogging Fast archive type
  The TagLogging Fast values are stored in compressed form in the database. You require approx. 10 to 15 bytes per measured value. In some cases greater compression is possible.
- TagLogging Slow archive type
  The space required for a measured value in the TagLogging Slow archive is 32 bytes.
- Message Archive:
  A message with the maximum number of associated values and comments requires 4 KB of space. The minimum value for a message is 172 bytes.

Calculation

You can use the following formula for calculating the maximum memory requirement per second:

- Memory requirement [bytes/s] = x * 15 bytes/value + y * 32 bytes/value + z * 4096 bytes/value

Key to the formula:

- x: average number of values of the TagLogging Fast archives per second
- y: average number of values of the TagLogging Slow archives per second
- z: average number of messages per second

Memory space required for several days:

You can use the following formula to calculate the memory space required for several days:

Memory space required [bytes/s] * 86,400 seconds * n days

Example

No.	Assumption	Description
1	x = 10,000 values/s	Number of values for the TagLogging Fast archives per second
2	y = 10 values/s	Number of values for the TagLogging Slow archives per second
3	z = 2 values/s	2 messages per second
4	n = 5	Number of days, where 1 day = 24 * 3,600s = 86,400s

Calculation

Memory space required in bytes for 5 days

= (10,000 values/s * 15 bytes/value + 10 values/s * 32 bytes/value + 2 values/s * 4,096 bytes/value) * 5 * 86,400 s

= (150,000 bytes/s + 320 bytes/s + 8,192 bytes/s) * 5 * 86,400 s

= (158,512 bytes/s) * 5 * 86,400 s

= 68,477,184,000 Byte

= approx. 64 GB

Space required for OS reports

In the case of a standard protocol with a page layout of "@CCAlgRtOnlineMessageGone.rpl", 120KB of space is required for a page with 32 messages.

You can find additional information about the page layout in the online help for *WinCC Information System*.

Space required for batch reports

You can find additional information about this in the SIMATIC BATCH Readme file.

You can find the Readme files after installation of SIMATIC BATCH in the Windows Start menu under:**Siemens Automation > Documentation > Readmes > Language**.

12.8 Calculation of storage space and the number of single segments

Number of single segments

Recommendations for an OS server:

- Do not create more than 200 single segments per OS server
- Create one single segment per archive type per day for the following archive types:
  - TagLogging Fast
  - TagLogging Slow
  - AlarmLogging

Before you calculate the number of single segments, calculate the maximum storage space per archive type per day.

Calculating the number of single segments for the TagLogging Fast archive

- You can use the following formula for calculating the maximum storage space per day:
  - Memory requirement [bytes/day] = x * 15 bytes/value * 86400 s
    Key to the formula:
    x: average number of values of the TagLogging Fast archive per second
- You can use the following formula for calculating the number of single segments per day:
  - Number of segments/day = Memory requirement [bytes/day] / configured max. size of a single segment

Calculating the number of single segments for the TagLogging Slow archive

- You can use the following formula for calculating the maximum storage space per day:
  - Memory requirement [bytes/day] = y * 32 bytes/value * 86400 s
    Key to the formula:
    y: average number of values of the TagLogging Slow archive per second
- You can use the following formula for calculating the number of single segments per day:
  - Number of segments/day = Memory requirement [bytes/day] / configured max. size of a single segment

Calculating the number of single segments for the AlarmLogging archive

- You can use the following formula for calculating the maximum storage space per day:
  - Memory requirement [bytes/day] = z * 4096 bytes/value * 86400 s
    Key to the formula:
    z: average number of values of the AlarmLogging archive per second
- You can use the following formula for calculating the number of single segments per day:
  - Number of segments/day = Memory requirement [bytes/day] / configured max. size of a single segment

12.9 Configuring additional archives in Tag Logging

12.9.1 Additional archives in the "Tag Logging" editor

Introduction

If you require further special archives in addition to the archives created by default, you can create these in the "Tag Logging" editor.

The following archive types are available in the "Tag Logging" editor:

Archive	Description
Process value archive	In the process value archive, all values are written directly from the process.
Compressed archive	The values from an existing archive are taken according to a principle defined by you and are written to this compressed archive.

Sequence of archiving

The default acquisition type is "cyclic-continuous". This means that archiving is carried out in defined cycles.

If you use a Process Historian, the data is stored automatically from this archive in the long-term archive.

Configuring archives

First, you manually assign all the tags to be stored in the archive. Then, you assign properties to these tags, such as the tag name and archiving cycle. You defined these properties in the process object view of SIMATIC Manager. The process object view displays all tags and their associated properties in a table where you can edit the properties.

Additional information

- Online help for *WinCC Information System*
- *Process Control System PCS 7; Engineering System* manual

12.9.2 Overview of configuration steps for a TagLogging archive

Introduction

Only perform these steps if you want to create additional archives.

You configure an archive in the "Tag Logging" editor.

Overview of configuration steps

Creating additional archives involves the following:

Step	Action
1	Specifying a new archive (Page 256)
2	Specifying the properties for the tags (Page 256)

12.9.3 How to specify a new archive

Requirement

The Tag Logging editor is open.

Procedure

1. In the tree view, select the hierarchy folder of the required archive type in the "Archives" hierarchy folder.
2. Switch to the "Archives ["Archive type"]" detail area.
3. In the "Archive name" cell, enter a name.
4. Select the cell with the name of the archive.
5. Set the properties for the archive.
6. Select the hierarchy folder of the archive you have created in the tree view.
7. Select the desired tag in the "Tag" cell.
   If you want to select several tags, press the <Ctrl> key and make your selection.
8. Set the properties for the tag.
9. Create additional archives as necessary.
   To do so, repeat steps 2 through 9.

Additional information

You can find additional information in the online help for *WinCC Information System*.

12.9.4 How to specify the tag properties

Introduction

You specify the tag properties in the process object view of SIMATIC Manager.

Requirements

- The "Tag Logging" editor is closed.
- The OS is closed.

Procedure

1. Open the process object view in SIMATIC Manager.
2. Select the "Measured value archives" tab.
   The data of the measured value archives are updated and displayed in table form. You can edit all fields with a white background.
3. In the "Filter by column" drop-down list, select "Archive name".
4. Enter the name of the archive whose tag properties you want to specify in the "Display" text field.
   The display is updated according to the filter.
5. Set the following properties:
   - Tag comment
   - Long-term archiving
   - Tag supply
   - Archiving
   - Acquisition cycle
   - Factor for archiving cycle
   - Archiving/display cycle
   - Saving on fault/error

Additional information

- *Process Control System PCS 7; Engineering System* manual

12.10 Configuring and using a Process Historian (external archive server)

12.10.1 Overview of archiving with the Process Historian

Introduction

The Process Historian is used as an external archive server for centralized long-term archiving of process values, such as measured values, messages and batch reports.

Note

- The following section provides general information and configuration descriptions for the Process Historian.
- You can find detailed information on configuring the Process Historian in the documentation for the Process Historian.

Configuration

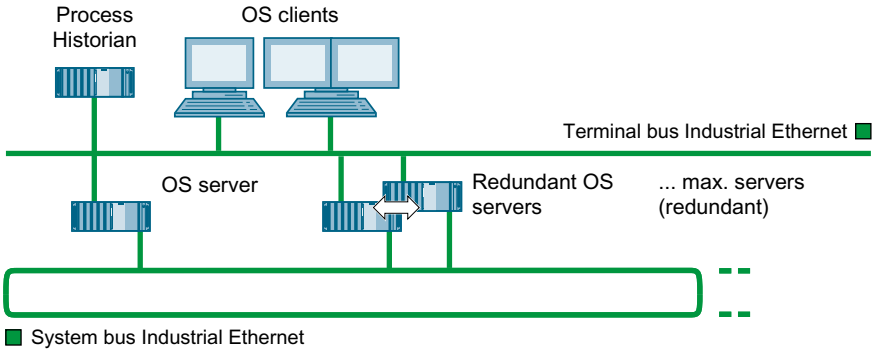
There can be **only one** Process Historian within a multiproject.

This is a node on the terminal bus and is not connected to the system bus.

When a Process Historian is used, data communication is required between the Process Historian and the OS servers from which data is to be archived.

The Process Historian can be configured redundantly to increase availability.
You can find additional information about this in the manual *Process Control System PCS 7; High Availability Process Control Systems*.

The following figure shows a sample plant configuration with a Process Historian:



Using a Process Historian

You can archive the following using a Process Historian:

- Messages (Alarm Logging)
- Archive values (Tag Logging)
- SIMATIC BATCH (batch reports)

Exporting archives to external media

Segments can be exported to external media.

For performance reasons, no backup devices may be used to archive data on PC stations in process mode.

Importing archives from external media

Data stored on external media can be read back **to the same** Process Historian to which it was exported.

Display of the archived data

- OS clients can display the following information of the Process Historian:
  - Process values stored in the archives in the form of trends or tables
  - Messages that are stored in the archives
    You can find additional information about this in section "Displaying archive data on the OS client (Page 264)".
- Batch reports
  On the Information Server, you create batch reports that are based on the archived data of the Process Historian. The Information Server is installed on a separate PC station.
  You can find additional information about this in section "Displaying archive data of the Process Historian with the Information Server (Page 265)".

Reaction to failure of the Process Historian

- Failure of a non-redundant Process Historian:
  If the Process Historian fails, single segments continue to be archived on the OS servers. The archive on the OS servers is a short-term archive. After activation of the Process Historian, data in the short-term archive that has not been exported is copied to the Process Historian.

  Note

  If the Process Historian fails for a period longer than the period of the short-term archive, the data on the OS servers is overwritten. The data can no longer be copied to the Process Historian.

- Failure of a redundant Process Historian:
  - Failure of a partner station
    If a partner station fails, data are only archived on the partner station that has not failed. Once the failed partner station has resumed operation, data synchronization takes place between the partner stations.
  - Failure of both partner stations
    See "Failure of a non-redundant Process Historian:".

Installation and licensing

During the system setup of PCS 7, you can find the add-ons for package installation of the Process Historian and reporting functions:

- Process Historian
- Information Server

These servers require additional licenses.

You can find information about this in the installation manual *Process Control System PCS 7; Licenses and Configuration Limits*.

Using Process Historian

When you use the Process Historian, the "Process Historian Ready Component" software component must be installed and configured on the operator stations on which the process values are to be archived on the Process Historian.

Additional information

Process Control System PCS 7; High Availability Process Control Systems manual

12.10.2 Archiving of messages and archive values

Requirements

- The OS servers and the Process Historian are available in the same project or multiproject.

  Note

  There can be **only one** Process Historian within a project or multiproject.

- In SIMATIC Manager (process object view), the measured values are marked for "long-term archiving" on the "Archive tags" tab.

Nature of the archiving process for messages and archive values

The archiving process for messages and archive values is as follows:

- The process data for the long-term archive will be written directly by the OS on the Process Historian.
- The process data configured in the "Tag Logging" and "Alarm Logging" WinCC editors is saved to the archives on the OS servers The properties of these archives are not relevant for archiving on the Process Historian.

Additional information

Documentation *Process Historian*

12.10.3 Archiving of batch reports

In PCS 7 V9.0 there is cyclic automatic SIMATIC BATCH data transfer to Process Historian.

12.10.4 Archiving on a redundant SIMATIC Process Historian

Archiving process on a redundant Process Historian

The data is archived parallel to the operator control and monitoring systems when a redundant Process Historian is available in the plant configuration:

12.10.5 Rules for Archive Configuration

Archive capacity requirements

The issue of how long the data are stored on the Process Historian depends on the archive size, the amount of data and how often data are stored.

You can find additional information about determining the storage space in section "Determining the archive storage capacity requirements (Page 251)".

Rules for archive configuration

The following rules must be taken into account for the configuration of the archives on an OS server and the configuration of the archiving routines on the Process Historian.

OS server rules:

- Set the time period and size for the single segments on the OS servers substantially shorter/smaller than the time period for the single segment on the Process Historian.
  - Set the time period for single segments in "Tag Logging":
    WinCC Explorer > Tag Logging > Archive configuration > Archive type TagLogging Fast and archive type TagLogging Slow > Properties > "Archive configuration" tab > "Time period and size of a single segment" parameter
  - Set the time period for single segments in the "Alarm Logging" editor:
    WinCC Explorer > Alarm Logging > Archive configuration > Message archive Archive type > Properties > "Archive configuration" tab > "Time period and size of a single segment" parameter
- The time period and size of all segments can be configured.
  However, the size of all segments is limited by hard disk capacity. The more hard disk capacity is available, the more data can be stored.

Additional information

You can find additional information about calculating the size of a single segment and calculating the maximum number of single segments in section "Calculation of storage space and the number of single segments (Page 253)".

12.10.6 Overview of configuration of a Process Historian

Overview of the configuration steps

The table below provides an overview of the required configuration for a Process Historian.

The table also shows in which program part you run these configuration tasks. The tasks are listed in the table in the order in which they should be performed.

Note

The following table contains general configuration descriptions for the Process Historian.

You can find detailed information on configuring the Process Historian in the documentation for the Process Historian.

The operator stations send tag values to the Process Historian, if the tag is configured with the "Long-term archiving" property.

You can find additional information about this in section "Archive tags (Page 81)".

Action	Location
Setting up the PC stations (network adapters) for the ES	SIMATIC Shell, "Set PC Station" configuration console
PC station for SIMATIC Process Historian • Inserting into a project • Specifying the name of the PC station	SIMATIC Manager
Configuring the hardware of the Process Historian: • Adding the "Process Historian" application and hardware components associated with this PC station.	HW Config
Activating the "Transfer to external archive server" option on the OS servers from which data is to be exported to the Process Historian [1]	SIMATIC Manager
After the "Process Historian" PC station starts, the Process Historian is ready for operation.	Process Historian **Note:** The Process Historian must be started manually after a manual stop.

[1] Also assign the archive server to an OS single station system.

Additional information

- *Process Control System PCS 7; Engineering System* manual
- *Process Control System PCS 7; High Availability Process Control Systems* manual
- *Process Control System PCS 7; PCS 7 - PC Configuration* manual
- Documentation for *Process Historian*

12.10.7 Configuration of a redundant Process Historian

You can install a redundant Process Historian to enhance availability.

You can find additional information about configuring a redundant Process Historian in the manual *Process Control System PCS 7; High Availability Process Control Systems*.

12.10.8 How to create and configure a Process Historian

Requirement

The OS servers have been compiled.

Procedure

1. In the component view of SIMATIC Manager, select the project into which you want to insert the Process Historian.
2. Select the menu command **Insert > Station > SIMATIC PC station**.
   A new SIMATIC PC station is inserted in the selected project.
3. Select the SIMATIC PC station.
4. Select the menu command **Edit > Object Properties**.
5. Enter the desired name in the "Name:" text field.
   Enter the Windows name of the station in the "Computer name" input box.
   Click "OK".
6. Select the SIMATIC PC station in the component view and open HW Config by double-clicking on the "Configuration" object in the detailed view.
   The hardware configuration of the SIMATIC PC station opens.
7. If the hardware catalog is not visible, select the menu command **View > Catalog**.
   The hardware catalog opens.
8. In the hardware catalog, navigate to the "Archive" directory.
9. Select the desired application and drag-and-drop it to the configuration table:

Desired external archive server	Application in the hardware catalog
Process Historian	• "Process Historian" for the PC station of the Process Historian • "Process Historian (stby)" for the redundant PC station of the Process Historian

10. Select the menu command **Station > Save and Compile**.
11. Close HW Config and change to SIMATIC Manager.

Additional information

You can find Information about creating a redundant Process Historian in the manual *Process Control System PCS 7; High Availability Process Control Systems*.

12.10.9 Displaying archive data on the OS client

Messages and process values

You can display messages and process values stored in the archives of the Process Historian on the OS client.

Note

If you use the Process Historian, nothing needs to be adapted or downloaded on the clients.

See also

Generating and downloading of server data (Page 295)

12.10.10 Displaying archive data of the Process Historian with the Information Server

Introduction

The Information Server allows you to access data archived with Process Historian (for example, messages, process values and logs).

Functions and possibilities

You can find detailed information on the functions and possibilities in the documentation for the Information Server.

The following table shows important functions in the SIMATIC Information Server.

Function	Purpose
Templates	Report templates for process values, messages and recipe data
Reports	Select pre-configured reports and: • Show • Export • Move • Delete
Exports	Manage exported reports: • Open • Move • Delete • Load pending exports
Subscriptions	Overview of automatically generated reports (subscriptions)
Excel templates	Manage Excel templates: • Create folder • Load files

Additional information

You can find additional information on this in the documentation of the Information Server.

12.11 Use of the Report Designer

12.11.1 Overview of reports with the Report Designer

Reports with the Report Designer

The Report Designer provides functions for creating and outputting reports. A variety of standard layouts are available to you for this. These standard layouts are identified with the "@" character prefixed to the name. You can customize the standard layouts and save them as a new layout. The Report Designer provides you with appropriate editors for this.

The OS reports are already created in SIMATIC Manager just as in the case of the process pictures.

Note

Always save your customized layouts under a new name.

12.11.2 Layouts in the Report Designer

Introduction

The Report Designer has two different layouts:

- Line layout
- Page layout

Line layout

You can use this layout to sequentially print all messages generated in process mode. This means: As soon as a message is generated it is immediately output to the connected printer.

You use the Line Layout editor to enter the required layout specifications in a dialog box, for example, number of rows and columns per page and width of the individual columns. You then select the message blocks that are to be printed from Alarm Logging.

Because this function is used in process mode, you set WinCC Explorer startup options so that the "Message Sequence Report" application is launched automatically when the computer is started up.

Page layout

In this layout, you use dynamic objects that are connected to the corresponding application. This is comparable to creating process pictures in the Graphics Designer. These objects are supplied dynamically with current data when they are printed out. For each page layout, you generate a corresponding print job and assign the print job to the page layout.

You can modify layouts in the Page Layout editor. The page layout editor is comparable to the Graphics Designer: The object pallet contains static and dynamic objects, which you insert into the layout. You connect the dynamic objects to the applications. You can also define a cover sheet and back page for each layout.

Print job

You must define a separate print job for **each** layout. Standard print jobs are provided for all standard layouts. If you have defined a custom layout, then define an associated print job afterwards.

Additional information

You can find additional information about the standard line and page layouts and print jobs provided in PCS 7 in the online help for the *WinCC Information System*.

12.11.3 Reports in the Report Designer

Introduction

The Report Designer offers two different types of reports. You use the layouts provided by the Report Designer based on the type of report you require:

- Message sequence report: Line layout
- Archive and user reports: Page layout

Message sequence report

You can create a message sequence report in the Report Designer. To do so, create a line layout and select the message blocks in Alarm Logging you want to included in the report. Once the line layout has been connected to a print job, the message sequence report is available in process mode.

The message sequence report is output on an operator station printer interface (LPT):

- A line printer prints out each message as soon as it arrives.
- A laser printer saves the messages and prints out an entire page.

When necessary, the printout of the message sequence report can also be started manually.

Archive and user reports

This report type is based on the page layout. You can define the layout appearance in a configuration dialog box. You specify the output printer and any backup printers in the associated print job.

Various events are used to control the output of an archive and user report. The following outputs are possible:

- Cyclical output, for example, once a month
- Output by clicking a button configured for this purpose
- Output whenever a process tag is modified

Additional information

You can find additional information about this in the online help for *WinCC Information System*.

12.12 Archive values in process pictures

12.12.1 Overview of display of archive values in process pictures

Displaying archive values in process pictures

With PCS 7 you can display archive values in process pictures. This provides the plant operator with a fast overview of specific process values.

You use the following trend displays for this:

- OnlineTrendControl: Display of process values as a function of time
- FunctionTrendControl: Display of the correlation of two process values.

Additional information

- Section "Working with the OnlineTrendControl (Page 270)"
- Section "Working with the FunctionTrendControl (Page 273)"

12.12.2 Trend display and trend display configuration in process mode

Overview

In process mode, values are displayed in the form in which you configured them in the Graphics Designer. The plant operator has the option of using the toolbar to work with the trend display.

- Show/hide trend displays
- Scroll through displays
- Underlay trends with areas

In addition, the plant operator can assemble additional new trend displays directly in process mode and view the measured values of process tags in trend displays. To do this, the plant operator must have the appropriate user permission.

Additional information

You can find information about the trend display in process mode in the *Process Control System PCS 7; OS Process Control* manual.

12.13 Working with the OnlineTrendControl

12.13.1 Function of the OnlineTrendControl

OnlineTrendControl

In the Graphics Designer, you can use the dynamic "OnlineTrendControl" object to configure trend displays of measured values. These measured value trends are visualized in process mode to allow quick visual checks by the operator. The operator can quickly detect whether a measured value trend develops only in one direction and he can initiate appropriate actions based on this information.

Display in OnlineTrendControl

The trend diagram is displayed as follows:

- The x-axis is automatically the time axis.
- The y-axis is the value axis.
  You can display a shared y-axis for all trends or a separate y-axis for each trend.

12.13.2 Tag connection in OnlineTrendControl

You can create trends for the following tags:

- Archive tags: This allows you to visualize tags written to the archive you created in the "Tag Logging" editor.
- Online process tags: These are used to directly visualize measured values of the process. This measured value is displayed to the operator as long as the OnlineTrendControl is displayed in the process control. The measured value that is displayed is not saved in the archive.

Tags from the archive and tags from the process can be displayed in a single OnlineTrendControl.

12.13.3 Configuration steps for the OnlineTrendControl

Overview of the configuration steps

Configuring the OnlineTrendControl comprises the following steps:

Step	Action
1	Inserting an OnlineTrendControl in the Graphics Designer (Page 271)
2 (optional)	Automatic transfer of properties of a tag (Page 271)

12.13.4 How to insert an OnlineTrendControl

Procedure

1. Open the required picture in the Graphics Designer.
2. If the "Controls" dialog box ("Controls" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbar**
   – In the submenu, select the "Controls" check box.
     The "Controls" dialog box opens.
3. In the "Controls" dialog box, select the object "WinCC OnlineTrendControl" in the tree view in the "AktiveX-Controls" folder.
4. Move the mouse pointer to the drawing area.
   The mouse pointer becomes a small icon for a control.
5. Hold down the mouse button and draw a rectangle the size of your trend display.
   The "WinCC OnlineTrendControl Properties" dialog box opens.
6. Set the properties for the "WinCC OnlineTrendControl".
   You can find additional information about the text fields and options in the online help for *WinCC Information System*.
7. Click "OK".
   The "WinCC OnlineTrendControl Properties" dialog box closes.

12.13.5 How to copy properties for the value axis automatically

Introduction

The following data for visualizing the range of values of a tag in the OnlineTrendControl in the process control is automatically copied from the corresponding PCS 7 block:

- A minimum value for the displayed range
- A maximum value for the displayed range

The "S7_xtrend" attribute at the block I/O of the tags to be displayed is used at the associated block type for this function.

Procedure

1. Select the desired block type in the master data library, for example, "MonAnL", and double-click the block type.
   The block editor opens.
2. In the block interface, select the block I/O to be displayed in OnlineTrendControl, for example, the block I/O "PV_Out".
3. Select the "Object Properties..." command in the shortcut menu. The "Properties - Tag" dialog box opens.

4. Go to the "Attributes" tab.
5. Check the "Attribute" column for the following entry:
   * for structured tags: "S7_xtrend"
   * for non-structured tags: "S7_trend"
   If no entry is present, insert the corresponding row.
6. Select the uppermost empty row in the "Attribute" column.
7. Select the entry for the tag attribute from the drop-down list.
8. In the corresponding row of the "Value" column, enter the block I/Os of the same block that contain the maximum and minimum value of the display range. Take into consideration the required representation in the "Value" column:

Attribute	Value
S7_xtrend	<structure element name,minimum value,maximal value>
S7_trend	<minimum value,maximal value>.
Structure element name and I/O names are always separated by a comma. **Example:** Block "MonAnL", attribute of the block I/O "PV_Out": attribute "S7_xtrend"; value "Value,PV_OpScale.Low,PV_OpScale.High"	

9. Click "OK".
   The "Properties - Tag" dialog box closes.
10. Save the block and close the block editor.
11. Update the instances of this block type in the CFCs of the project.
12. Compile the OS.

Result

The following fields are configured automatically in the "Value axes" tab in the properties of the OnlineTrendControl.

- The "Automatic" check box is selected.
- The "From:" and "To:" input fields.
  The tag names for the minimum and maximum values are shown in these fields.

In process control, the relevant values are applied to the Y-axis when the Online Trend Control is opened.

You can find additional information about configuring the OnlineTrendControl in section "How to insert an OnlineTrendControl (Page 271)".

12.14 Working with the FunctionTrendControl

12.14.1 Function of the FunctionTrendControl f(x)

FunctionTrendControl

You can use the FunctionTrendControl to display two different process values. These process values can be displayed on both the x-axis and y-axis. These are then mapped as a trend, for example, a "pressure versus temperature" trend. When you select process values to be displayed on the x- and y-axes, it is important that the process values are measured at approximately the same time.

The FunctionTrendControl can display at least eight different trends with a maximum of 10,000 value pairs.

Contstraints

You can only display cyclic-continuous tags in the FunctionTrendControl. Both archive tags must have been assigned the same archiving conditions when you visualize a pair of values from the archive: The cycle of both tags must match.

Note that you can only download tags from the archive of one server for an axis pair.

Trend values are provided from the following archives:

- Process value archive
- Online tags

12.14.2 Tag connection in the FunctionTrendControl

Tag connection in the FunctionTrendControl

The properties of the FunctionTrendControl provide several options for connecting tags to the function:

Tag type	Meaning
Archive tags	Values from a TagLogging archive
Online tags	Values taken directly from the process

Note

The same types of tags must be used for the x and y-axes on a trend.

12.14.3 How to insert a FunctionTrendControl

Procedure

1. Open the required picture in the Graphics Designer.
2. If the "Controls" dialog box ("Controls" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbar**
   – In the submenu, select the "Controls" check box.
     The "Controls" dialog box opens.
3. In the "Controls" dialog box, select the object "WinCC FunctionTrendControl" in the tree view in the "AktiveX-Controls" folder.
4. Move the mouse pointer to the drawing area.
   The mouse pointer is transformed into a small control cursor.
5. Hold down the mouse button and draw a rectangle matching the size of your trend display.
   The "WinCC FunctionTrendControl Properties" dialog box opens.
6. Set the WinCC "FunctionTrendControl" properties.
   Information about the individual input boxes and check boxes is available in the *WinCC Information System* online help.
7. Click "OK".
   The "WinCC FunctionTrendControl Properties" dialog box closes.

Time synchronization 13

13.1 Setting the time synchronization

13.1.1 Overview of time synchronization

Time synchronization

Process data can be evaluated if all the components of the process control system work with an identical time of day. This assures that messages can be assigned to the correct time sequence, irrespective of the time zone in which they originate.

To synchronize the times on all operator stations and automation systems on the plant bus and terminal bus, an OS server, for example, acts as the time master from which all stations get their time.

The assumption and relinquishment of the "time master role" is indicated by process control messages.

Time master and time slave

You must configure the time synchronization for each operator station to ensure time synchronization.

In time synchronization, a distinction is made between the time master and time slave:

- Time master
  OS server and SICLOCK are ordinarily defined as the time master. In the case of OS servers, a time master can function as an "active time master" and "passive time master": The active time master sends the time frames to the time slaves and the passive time masters. If the active time master fails, a passive time master can function as an active time master at any time.
- Time slave
  The OS clients and automation systems are defined as time slaves. The time slaves receive the time message frames and use them to set their internal clocks.

13.1.2 Time synchronization with alternative time masters

Introduction

You can perform time synchronization with multiple OS servers on a common plant bus. The automation systems must be configured as time slaves for this.
All OS servers can be configured as time masters.

Basic mode of operation

As soon as an OS server that is specified as the time master is configured, it checks whether or not another time master is active, that is, it waits a specified length of time to receive a time message frame. If it receives no time message frame, it sends a time message frame on the plant bus. It then becomes the active time master.
If this time master fails, another OS server configured as a time master begins functioning as the active time master.
If an OS server is equipped with an external real-time clock (DCF77/GPS), it forces the time master role.

In the case of a redundant OS server, the OS server (stby) cannot be the active time master.

You can also perform the time synchronization on a redundant plant bus.

Additional information

- *Process Control System PCS 7; High Availability Process Control Systems* manual

13.1.3 Operation local standard time and coordinated universal time (UTC)

Introduction

Internally, the PCS 7 system always uses UTC. Time information that is to be displayed for the operator in process mode can be converted from UTC to the local geographical time.

System configurations in which the automation system is in a different time zone than the operator station are thus possible. If necessary, the plant operator can also change between the display of coordinated universal time and local time during runtime.

Mixed operation

Mixed operation is not supported; all automation systems within a plant use either local standard time (WinCC V5 compatibility mode) or UTC. For a plant configuration extending across more than one time zone, UTC must be used without exception.

13.1.4 How to set up the time system

Procedure

1. Select the "[Computer name]" object in the tree view in WinCC Explorer.
   The detail window displays the corresponding computer.
2. Select the "[Computer name]" object in the detail window and select the menu command **Edit > Properties**.
   The "Computer Properties" dialog box opens and the "General" tab is active.
3. Select the "Parameters" tab.

4. Select "The PLC is set to coordinated universal time (UTC) (preferred setting)" option in the "PLC clock setting" group.
5. In the "Time basis for the clock shown in Runtime" group, select the required time mode from the drop-down list box. The time zone is only important for the display in process mode. UTC is used exclusively internally, e.g. in archives.
   The following options are available setting the time mode.
   – Select "Time zone of server (migrated projects)" for the "Time for migrated projects" mode.
   – Select "Local time zone" for the "Local winter time" mode.
   – Select "Coordinated Universal Time (UTC)" for the "UTC" mode.
6. Select the required format in the "Central date and time formatting" group. This format setting will affect how the date and time are displayed in process control.
   The following options are available for setting the date/time format:
   – For the "Configured format" format, select "Configured format for components" (default).
   – Select "Force ISO8601 format on all components" for the "Format according to ISO8601".
7. Click "OK".

13.1.5 Time synchronization with external real-time clocks

External real-time clock

The following real-time clocks are used for time synchronization with an external real-time clock in the PCS 7 environment:

- DCF77RS
- GPSDEC
- SICLOCK
  - with DCF77RS
  - with GPSDEC

DCF77RS or GPSDEC can be connected to the COM interface of an OS server.

We recommend a SICLOCK with an external real-time clock (DCF77RS or GPSDEC) for high-precision time synchronization.

You can find additional information about the external real-time clock in the *SICLOCK TM* operating Instructions.

13.1.6 How to connect a DCF77RS or GPSDEC

Requirements

- The COM interface is set in the Control Panel.
- The extended FIFO setting must be switched off.
- The DCF77RS reception service must be installed, parameters must have been assigned, and it must have been started.

Synchronizing OS servers

1. Open the WinCC project of the OS server.
2. Select the "Time synchronization" editor in the tree view of WinCC Explorer.
3. Open the shortcut menu and select the menu command **Open**.
   The "Time Synchronization" dialog box opens.
4. Select the "Use time receive utility" check box.
5. Select the "Synchronization via System Bus (Master, Slave)" check box.
6. Select the required CP from the "Access point 1" drop-down list.
   All CPs present in the OS server are displayed here. Select the CP for which you have activated time synchronization in the configuration console.
7. Select the "Master" option.
8. When you use a redundant CP, select the required CP for "Access point 2".
9. Select the "Master" option.
10. Click "OK".

13.1.7 Time synchronization via the terminal bus

Introduction

OS clients are connected to the OS servers via the terminal bus. In certain network configurations, the terminal bus can also connect the remaining company network.

Settings for time synchronization via the terminal bus

In the PCS 7 environment, you use the following two settings for the terminal bus to configure time synchronization:

- The "Use the time from a connected WinCC server" option is important when setting the time synchronization of OS clients: All OS servers on the terminal bus from which the OS client has uploaded the server data can be operated as time master for an OS client. OS clients have only simple network adapters. They cannot send or receive time message frames; instead, they cyclically query the time from the OS server.
- The "Use the time from a specific computer" option is important when setting the time synchronization of OS servers within a domain: The computer names you enter in this dialog correspond to the names of the domain controllers in the Windows network.
  The OS server gets the time from the domain controller by default.
- The "Let time be set by external (3rd party) components" option is not applicable in the PCS 7 environment.

13.1.8 Time synchronization via the system bus

Introduction

OS servers and automation systems are connected to the system bus.

Requirements

Time synchronization via the system bus requires one of the following interfaces:

- Communications processor CP 1613 or CP 1623
- Network adapter with connection to the system bus via Industrial Ethernet (BCE)

The interface cards provide the following options:

- Sending and receiving of time message frames
- Saving the time-of-day
- Configuration as time master or time slave

Settings for time synchronization via the system bus

You usually specify all OS servers in a workgroup as time masters, so that every OS server acting as a passive time master can become an active time master in the event of a clock failure. All automation systems are always time slaves.

13.1.9 Time synchronization in the workgroup

Introduction

You can synchronize the OS servers and automation systems in a workgroup via an external real-time clock.

Behavior of the OS servers

All OS servers become passive time masters. They are synchronized by the SICLOCK via the system bus. If the SICLOCK central system clock fails, an OS server assumes the function of active time master.

In the case of a redundant OS server, the OS server (stby) cannot be the active time master.

OS client behavior

OS clients receive the time of day from an OS server via the terminal bus. OS clients can only receive the time from OS servers from which they have downloaded server data.

13.1.10 How to make the settings for the workgroup

Requirements

Time synchronization via the system bus requires one of the following interfaces:

- Communications processor CP 1613 or CP 1623
- Network adapter with connection to the system bus via Industrial Ethernet (BCE)

The interface cards provide the following options:

- Sending and receiving of time message frames
- Saving the time-of-day
- Configuration as time master or time slave

Synchronizing OS servers

Carry out the following steps for each OS server.

1. Open the WinCC project of the OS server.
2. Select the "Time synchronization" editor in the tree view of WinCC Explorer.
3. Open the shortcut menu and select the menu command **Open**.
   The "Time Synchronization" dialog box opens.
4. Select the "Synchronization via System Bus (Master, Slave)" check box.

5. Select the required CP from the "Access point 1" drop-down list.
   All CPs present in the OS server are displayed here. Select the CP for which you have activated time synchronization in the configuration console.
6. Select the "Master" option.
7. If you are using a redundant CP, select the required CP for "Access point 2".
8. Select the "Master" option.
9. Click "OK".

Synchronizing OS clients

Carry out the following steps for each OS client.

1. Open the WinCC project of the OS client.
2. Select the "Time synchronization" editor in the tree view of WinCC Explorer.
3. Open the shortcut menu and select the menu command **Open**.
   The "Time Synchronization" dialog box opens.
4. Select the "Synchronization via Terminal Bus (Slave)" check box.
   This activates all associated option buttons and text fields.
5. Select the "Use the time from a connected WinCC server" option.
6. Click "OK".

13.1.11 Time synchronization in a domain

Requirement

All operator stations must be installed in one domain.

Rules

Note

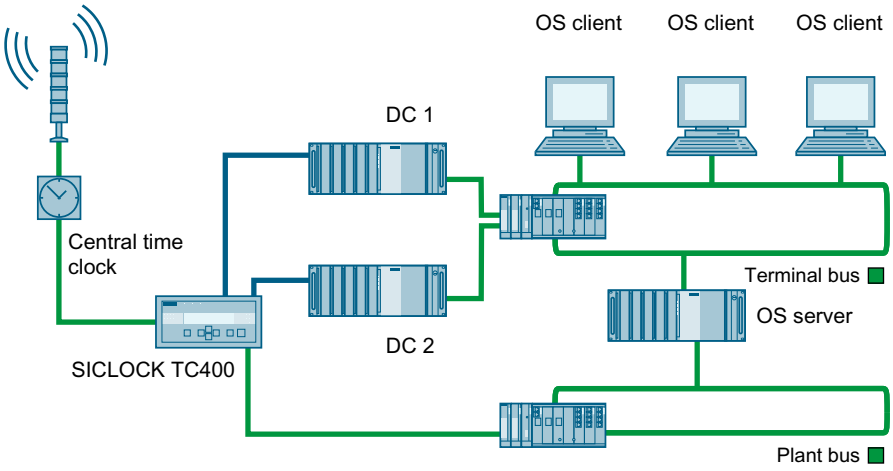
Before you set the time synchronization parameters for a PCS 7 plant in a Windows domain, create a detailed plan of your network structure. This plan must contain all the relevant information for time synchronization:

- Which computer is the domain controller?
- Which computers belong to the domain and receive the time of day from the domain controller?
- Which computers do not belong to the domain and where do they obtain their time from?
- Which computers are time masters and which are time slaves?

Time synchronization of all components of a PCS 7 plant in a domain

If you want time synchronization of all components in a PCS 7 plant, synchronize the plant bus and domain controllers DC1 and DC2 via a central plant clock, e.g. SICLOCK. The domain controllers synchronize the terminal bus.

The following figure shows a theoretical system configuration:



Time synchronization of the OS servers via the terminal bus

The domain controller is synchronized by a high-precision central plant clock.
The OS servers are synchronized by the domain controller via the terminal bus. They act as passive time masters on the system bus and, in this configuration, cannot be synchronized via the system bus.

Should the central system clock fail, one of the OS servers becomes the active time master on the system bus.

Time synchronization of the OS client via the terminal bus

The OS clients are assigned to get their time synchronization from one of the connected OS servers via terminal bus.

Additional information

- *Process Control System PCS 7; Time-of-Day Synchronization* manual

13.1.12 How to synchronize with a domain controller

Synchronizing OS servers

Carry out the following steps for each OS server.

1. Open the WinCC project of the OS server.
2. In the WinCC Explorer tree view, select the "Time Synchronization" editor.
3. Select the **Open** command from the shortcut menu.
   The "Time Synchronization" dialog box opens.
4. Select the "Synchronization via Terminal Bus (Slave)" check box.
   This activates all associated option buttons and text fields.
5. Click "Use the time from a specific computer".
6. Enter the first domain controller (DC1) in the "Computer 1" text field and the second domain controller (DC2) in the "Computer 2" text field.
7. Select the "Synchronization via System Bus (Master, Slave)" check box.
   This activates all associated option buttons and drop-down lists.
8. In the "Access point 1" list, select the required CP.
9. Select the "Master" option (default setting).
10. When you use a redundant CP, select the required CP for "Access point 2".
11. Select the "Master" option (default setting).
12. Click "OK".

Synchronizing OS clients

Carry out the following steps for each OS client.

1. Open the WinCC project of the OS client.
2. In the WinCC Explorer tree view, select the "Time Synchronization" editor.
3. Select the **Open** command from the shortcut menu.
   The "Time Synchronization" dialog box opens.
4. Select the "Synchronization via Terminal Bus (Slave)" check box.
   This activates all associated option buttons and text fields.
5. Select the "Use the time from a connected WinCC server" option.
6. Click "OK".

Additional information

- *Process Control System PCS 7; Time-of-Day Synchronization* manual

Lifebeat monitoring 14

14.1 Setting the lifebeat monitoring

14.1.1 Overview of lifebeat monitoring

Introduction

The lifebeat monitoring function is used to monitor the functionality of all AS and OS of the process control system. A process control message is generated if an AS or OS do not respond to a lifebeat request.

Note

The process control system SIMATIC PCS 7 has a cross-sector Asset Management System. It provides the user with additional extensive possibilities for preventive and foreseeable diagnostics and maintenance of the plant.

Additional information: SIEMENS portal process automation (https://support.industry.siemens.com/cs/ww/en/view/59538371)

Lifebeat monitor

Lifebeat monitoring is performed centrally from an OS that you have designated as the lifebeat monitor. The lifebeat monitor monitors all OS servers, OS clients, and automation systems. Requirement: All the components to be monitored are connected to a continuous network and assigned to the lifebeat monitor. The monitoring is performed in a cycle that you can specify when configuring lifebeat monitoring.

You configure lifebeat monitoring in the WinCC "Lifebeat Monitoring" editor.

Note

Lifebeat monitoring and maintenance station

If you are running a maintenance station in the plant, configuration of the lifebeat monitoring with "Lifebeat Monitoring" is prohibited.

Monitoring an automation system

On an automation system, a process control message is generated in two situations:

- The lifebeat monitoring reads the current operating state from the AS: The lifebeat monitor generates a system message when a status transition such as RUN to STOP is detected.
- The lifebeat monitoring sends monitoring requests to an AS. If, for example, the power supply or device has failed or the connection has been interrupted, the AS can no longer react to the monitoring request and a process control message is generated.

Monitoring an operator station

Lifebeat monitoring of an operator station is performed via a monitoring request – as is the case for an automation system.

You can find a detailed description of the configuration in the online help *WinCC Information System*, topic "Lifebeat Monitoring".

14.1.2 Display of lifebeat Monitoring in process mode

Cycle for lifebeat monitoring in process mode?

The lifebeat monitoring is automatically activated when the OS starts up. It monitors the OS in cycles of between 5 seconds and 1 minute.

Display of error message

An error message appears as follows:

- If the lifebeat monitoring identifies a failed component, a process control message is automatically generated.
- The state of all monitored components is also displayed in a separate picture that the operator can display using a button in the button set. In this picture, the failed component is indicated by a "strike-through". Supplementary text is also provided in this picture, e.g. "faulty", "Server failed", "Server integrated"

The elimination of a problem is also indicated by a process control message.

14.1.3 How to configure the lifebeat monitoring

Requirements

- The hardware configuration and network connections for all automation systems and operator stations have been configured in SIMATIC Manager.
- An OPC connection is created in WinCC Explorer for each operator station that you want to monitor.
  You can find additional information about this in the online help for *WinCC Information System*.

Note

Lifebeat monitoring and maintenance station

If you are running a maintenance station in the plant, configuration of the lifebeat monitoring with "Lifebeat Monitoring" is prohibited.

Procedure

1. In the WinCC Explorer tree view, select the "Lifebeat Monitoring" editor.
2. Select the **Open** command from the shortcut menu.
   The "Lifebeat Monitoring – [Name of OS]" dialog box opens.
3. Click "Add".
   This inserts a new row in the "Device List" table.
4. Double-click the field in the "Device Name" column and enter a unique, descriptive device name, such as the plant name for the component from the plant hierarchy that you created in SIMATIC Manager.
5. Double-click the field in the "Device Type" column and select the device to be monitored from the drop-down box.
   Select, for example, the entry "AS-4xx" if you are using a CPU 4xx or the entry "OS" if you want to monitor an OS.
6. Double-click in the field of the "Connection" column.
   This displays all of the S7 programs that you created in SIMATIC Manager when configuring the ES.
7. In the drop-down box, select the program associated with the AS you want to monitor.
   You have already made this setting in SIMATIC Manager.
8. Repeat steps 2 and 7 if you want to monitor additional components.
9. In the "Monitoring Cycle" group, select the cycle time for performing lifebeat monitoring in process mode.

10. Click "Update".
    The bottom area of the dialog box returns a preview of the picture that can be displayed to the operator in process mode.
    The "@CONFIG.PDL" picture is generated in the background and can be called by the operator in process mode.
11. Click "Close".

Process pictures with tags from different OS servers 15

15.1 Interconnection of tags of different OS servers

Introduction

You can interconnect tags of different OS servers in a process picture and display the tags in a process picture on the OS client. The process picture is stored on the OS server. Server-to-server communication is used for this purpose.

Configuration rules

To be able to use this function, observe the following when configuring:

- Map a plant onto exactly one OS server in the plant hierarchy. This setting must be passed on to all lower-level folders, that is to say, lower-level hierarchy folders may not be connected to other OS servers.
- When interconnecting tags in the Graphics Designer, use only "WinCC tags" as the data source for the tags.

Rules for downloading server data

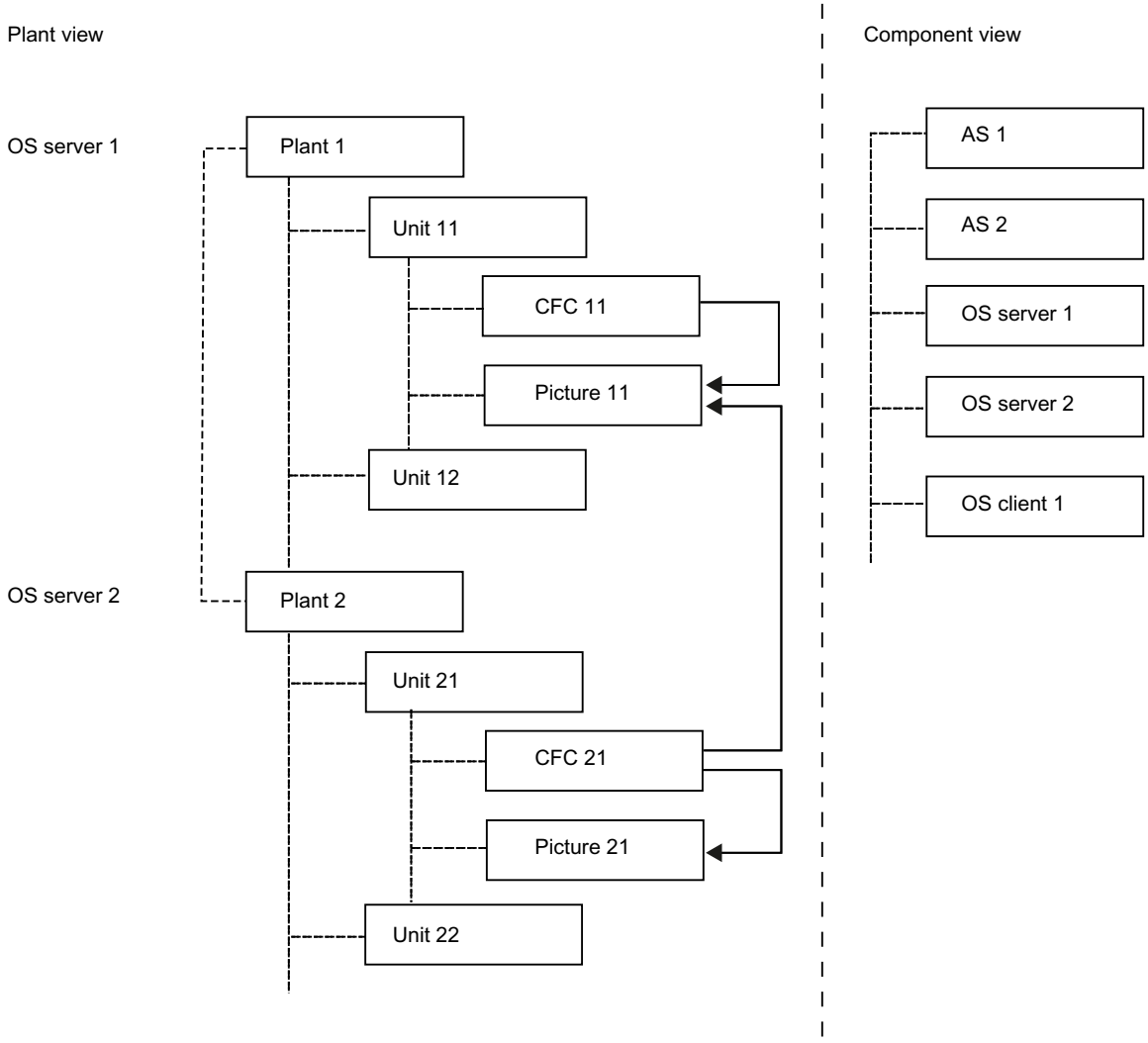
When downloading server data, observe these guidelines:

- The OS client needs the server data from all OS servers whose data it is going to display, e.g. process data or picture data.
- The OS server on which you configure a picture that uses tags from other OS servers needs the server data of the OS server whose tags it is going to display.

15.2 Example configuration for tag connection

Explanation of example project

On the basis of this example project, we will show you the required configuration steps in order to better illustrate the relationships:



Explanations for the picture

Information about the picture:

- Plant 1 is assigned to OS Server 1.
- Plant 1 contains the process picture "Picture 11", in which a server-internal and a cross-server tag connection will be made:
  - Tag from CFC 11 of plant 1 – server-internal
  - Tag from CFC 21 of plant 2 – cross-server

- Plant 2 is assigned to OS Server 2.
- Plant 2 contains the process picture "Picture 21", in which only server-internal tag connections will be made:

15.3 How to configure pictures with tags of different servers

Requirements

- The OS servers and OS clients have been created.
- The path to the target OS has been specified.
- The AS-OS assignment has been made.
- All ES data have been configured, e.g. CFC charts or SFC charts.

Procedure

1. In SIMATIC Manager, open the component view.
2. Select OS Server 1 in the tree view.
3. Select the menu command **Options > OS > Generate Server Data**
4. Select OS Server 2 in the tree view.
5. Select the menu command **Options > OS > Generate Server Data**.
   The required server data is generated.
6. Select OS Server 1 in SIMATIC Manager and select the menu command **Options > OS > Assign OS server…**.
   The "Assignment OS Server for [name of OS]" dialog box opens.
7. In the "Assignment OS-Server for [name of OS]" dialog box, select OS Server 2.
8. Click "OK".
   All of the required tags for the cross-server tag connection for OS Server 2 are now available in the tag management.
9. Open "Picture 11" in the Graphics Designer.
10. Make the tag connection:
    - Perform the tag connections for CFC 11.
      You are familiar with this process:
      Data source "ES tags" and selection of tag in PH
    - Perform the tag connections for CFC 21.
      This process applies to a cross-server tag connection:
      Data source "WinCC tags" and selection in the folder
      "WinCC tags/ [name of server data]/ SIMATIC S7 Protocol Suite/ [connection]/ S7 program"

    Note

    Note the following:
    - Only use data sources with WinCC tags.
    - If you rename a CFC chart in SIMATIC Manager, correct the corresponding tag interconnections manually, as these are not updated automatically.

11. Configure the process picture "Picture 21" in the usual way.

12. Select OS Server 1 in SIMATIC Manager and select the menu command**Options > 'Compile Multiple OSs' wizard' > Start**.
13. In the "Wizard: Compile multiple OSs'", in the step "Select the compilation data and scope of compilation", enter the following compilation settings:
    - Clear all check boxes in the "Data" group.
    - Activate the "Changes only" option button in the "Scope" group.
14. In SIMATIC Manager, select the project and select the menu command **PLC > Compile and Download Objects**.
15. Enter the download settings for the objects "OS Server 1" and "OS Server 2" and download the data of OS Server 1 and OS Server 2 to the target station.

    Note

    Select the check box "The entire WinCC project".

16. Open the WinCC project of the OS Client 1 and download the server data of OS Server 1 and OS Server 2.
17. Download the data of OS Client 1 to the target station.

Server data 16

16.1 Downloading server data

16.1.1 Generating and downloading of server data

Server data

The server data contains all the important information for the OS clients. These server data is automatically generated when the OS servers are compiled or downloaded. All OS clients that access data of multiple OS servers require the server data of all OS servers with which they "cooperate". With the "Assign OS server" function in SIMATIC Manager, you can select the required server data and download it to the OS client or to the OS server.

The server data is stored in a special file. The name of the file has the following structure:

[name of project]_[name of server].pck

PCS 7 Maintenance Station

If you are using a PCS 7 Maintenance Station in your project, allocate the server data as follows:

- The PCS 7 Maintenance Station requires the server data of all OS servers.
- For more information, refer to the *Process Control System PCS 7; Maintenance Station* manual.

Server-to-server communication

If you use process pictures in your project to which you want to interconnect tags from various OS servers, you must set up server-to-server communication. For server-to-server communication, you must also download server data to OS servers.

You can find additional information about this in section "Interconnection of tags of different OS servers (Page 289)".

16.1.2 How to download server data

Requirements

- The destination path for all OS servers and OS clients has been entered.
- All OS servers have been compiled so that the server have be generated.

Procedure

The following steps apply when downloading the server data to both an OS client and an OS server.

1. In SIMATIC Manager, open the component view.
2. In the tree view, select "SIMATIC PC Station/WinCC application Client/[name of OS client or OS server]".
3. Open the shortcut menu and select the menu command **Assign OS Server**.
   The "Assignment OS Server for [name of OS]" dialog box opens.
4. Select the check box of the OS server whose server data you want to assign to the OS client or OS server selected above.
5. Click "OK".
   The server data download is started and the message dialog box with progress display opens.
6. Once the download has been successfully completed, click "OK".
7. Repeat steps 2 to 6 for all OS clients and OS servers that require server data.

Monitoring automation systems

For automation systems to be monitored on "OS clients with diagnostics view" or on MS clients (on an engineering station), the server data of the associated OS servers and maintenance station must be downloaded to these PC stations.

16.2 Determining the default servers for OS client

16.2.1 How to assign the default servers

Introduction

You need to assign a default server to some components for OS clients.

Note

Always assign OS clients with the same server data to the same OS server as the default server.

Note

When using a reference OS, you only assign the default servers to the base OS.

Requirement

- The server data has been imported.

Procedure

1. Select the "Server Data" editor in the WinCC Explorer tree view, and then select the **Standard Server...** command from the shortcut menu.
   The "Configure Standard Server" dialog box opens.
2. Select the entry for the "Alarms" component in the "Symbolic computer name" column.
3. Select the default server from the drop-down list.
   The drop-down list contains the symb. computer names of all server data loaded on the client.
4. Repeat steps 2 and 3 for all remaining components.
   - SSM (Split Screen Manager)
   - User archives
5. Click "OK".

Result

Default server for the "Alarms" component:

- For operator inputs that are carried out on an OS client, operator messages are generated and saved on the default server.
- The global settings for the group displays, the extended status display and the extended analog display are saved on the default server for the "User-configurable message classes" function.
- The global settings for the message lists are saved on the default server for the "Define message colors for individual columns" function.

Default server for the "SSM" component:

- Trend groups that are composed on an OS client are saved on the default server.
  If no default server for the SSM component is configured on the OS client, the composed trends are saved locally on this OS client. These trend groups cannot be displayed in the OS server project.
- Screen compositions executed on an OS client are saved on the default server and its redundant partner.
  If no default server is specified, the executed screen compositions of the OS client are stored locally on this OS client. These screen compositions cannot be displayed in the OS server project.

Using the PCS 7 Maintenance Station 17

Overview

The PCS 7 Maintenance Station (MS) focuses on "Plant Asset Management" and enables preventive and predictive diagnostics and maintenance of the plant. In parallel with process control, the maintenance station also provides comprehensive maintenance information and functions for the system components (assets).

While the plant operator receives all process-relevant information and can intervene selectively in the process via the operator system (OS), the maintenance engineer inspects the automation system hardware and processes the associated maintenance messages and maintenance requests via the maintenance station.

The basis of a maintenance station is always an OS that provides these maintenance functions. An OS is specified as an MS when the OS is assigned during the creation of the diagnostic structure in the plant hierarchy.

Types and configuration

The maintenance station can be used as the following types and configurations:

- Maintenance Station Basic
  This type of maintenance station can be configured as an MS single-station system or as an MS multiple-station system.
- Maintenance Station Standard
  This type of maintenance station can be configured as an MS single-station system or as an MS multiple station system.
- SIMATIC PDM maintenance station
  The SIMATIC PDM MS is configured as an MS single-station system. This maintenance station displays the diagnostic information determined by SIMATIC PDM.

Additional information

You can find basic information on configuration and process control of the maintenance station in the manual *Process Control System PCS 7; Maintenance Station*.

See also

Operator control and monitoring of the process mode via the Internet or an intranet (Page 327)

Downloading and activating a project 18

18.1 Overview of downloading a project

Introduction

Before you can run a project in process mode, you must transfer the data you configured to the various OS servers and OS clients.

Note

Before attempting to download, ensure that there is sufficient memory capacity available on the PC station hard disk for process mode (OS server, OS clients or OS single station) so that the project and server data can be accommodated.

Options for downloading a project

You have two options for downloading in PCS 7:

Type	Description
Download entire program	You must run this function when you download a project for the first time or after making extensive changes to a project, such as adding a new automation system. Although you can transfer this change with the "Download changes" function, this does not significantly reduce the time required for the download operation. Note that the OS must be stopped when performing a full download.
Download changes:	You use this function after making minor changes. This function is started for the OS server from the ES. The OS clients are automatically updated with the update of the server data. This function has two advantages: • The OS can remain in process mode • The time it takes to download is noticeably reduced.

18.2 Requirements for downloading the entire program

Introduction

Before you can download a project to the OS servers and OS clients and activate it, you must have completed the following actions:

OS server

The requirements for the OS server are:

Completed step	Additional information
Creating and downloading hardware configuration in HW Config	*Process Control System PCS 7; Engineering System* manual
Configuring and downloading network connections in NetPro	Section "Configuring network connections for an OS (Page 49)" *Process Control System PCS 7; Engineering System* manual
Configuring the hardware components in the component configurator	Section "How to check and change the configuration (Page 51)"
Performing the ES configuration, e.g. creating CFCs or SFCs in SIMATIC Manager	*Process Control System PCS 7; Engineering System* manual
Downloading the ES data to the automation systems	*Process Control System PCS 7; Engineering System* manual
Compiling the OS servers without error messages	Section "Compiling the OS (Page 91)"
Performing the OS configuration, e.g. creating process pictures or OS reports	Section "Overview of reports with the Report Designer (Page 266)"
Downloading the server data via the assignment of OS servers This is only necessary if you use server-to-server communication.	Section "Generating and downloading of server data (Page 295)"

Note

In the step "Compiling the OS servers without error messages", observe the following:

If a maintenance station is used in the project, adhere to the following processing sequence:

1. Create the diagnostics screens
2. Compile the OS servers and MS servers

OS clients

The requirements for the OS clients are:

Completed step	Additional information
Creating the hardware components in HW Config There is no need for an Ethernet card for OS clients.	Section "Overview of hardware configuration (Page 39)" *Process Control System PCS 7; Engineering System* manual
Configuring and downloading network connections in NetPro There is no need for an S7 connection for OS clients.	Section "Configuring network connections for an OS (Page 49)" *Process Control System PCS 7; Engineering System* manual
Configuring the hardware components in the component configurator There is no need for an Ethernet card for OS clients.	Section "How to check and change the configuration (Page 51)"
Downloading the server data via the assignment of OS servers	Section "Generating and downloading of server data (Page 295)"

18.3 Background information about compiling and downloading the entire program

Introduction

A project is downloaded in SIMATIC Manager with the central "Compile and Download Objects" function. PCS 7 makes the "Compile and Download Objects" dialog box available. The representation of objects in this dialog corresponds with the component view in SIMATIC Manager: the view shows all SIMATIC PC stations that you created in SIMATIC Manager. You specify all options for compiling and downloading centrally in this dialog box. In addition, you specify in this dialog box whether the entire project or individual operator stations are to be compiled and downloaded.

Special circumstances when downloading in the case of single station systems

If the OS and ES are to be operated on one PC station, you do not have to perform a download operation because all required data are already present.

Special circumstances when downloading in the case of single station systems with a reference OS

If you have configured operator stations as a reference OS on a base OS, then you must download all the operator stations (base OS and reference OS).

Special circumstances when downloading in the case of redundant operator stations

If the OS is redundant, you can first stop one OS, download it, and reactivate the OS while the other OS remains in process mode. You then download the second OS while the first one remains in process mode. In this way, you do not have to shut down the entire system.

Sequences for compiling and downloading

During compile and download operations, the following sequences run in the background:

- Server data are automatically generated for the associated OS clients.
- The computer names of the operator stations in WinCC Explorer are changed automatically from the computer names of the ES to the names of the destination operator stations.
- Objects are automatically downloaded in the proper order.
- During the compile and download operation, a detailed log of all individual steps is created, which you can open after completion of the compile and download operation.

Storage of pictures and scripts

The scripts and pictures are automatically copied to the following directories on the OS client:

- Pictures: \...\GraCS
- Scripts: \...\Library

18.4 How to download multiple operator stations

Introduction

If you want to perform the "Download entire project" or "Download Changes" function for multiple operator stations, use the "Compile and Download Objects" dialog box.

Requirement

All editors in WinCC Explorer are closed.

Procedure

1. In SIMATIC Manager, open the component view.
2. Select the multiproject and select the menu command **PLC > Compile and Download Objects**.
   The "Compile and Download Objects" dialog box opens and all objects are displayed according to the component view.
3. Click the 'plus' symbol to reveal the lower-level objects.
4. In the "Download" column, clear the check boxes for all operator stations that you do not want to download.
5. In the tree view, select the OS that you want to download.
   The "Edit" button activates.
6. Click the "Edit" button.
7. If you have selected an OS server, the "Settings: Compile OS" dialog box opens.
   Set the required parameters in the individual steps and click "Apply".
   The dialog box "Settings: Download OS" dialog box opens. Continue with step 8.
   You can find additional information about this in section "How to compile multiple operation stations (Page 94)".
8. If you have selected an OS client, the "Settings: Download OS" dialog box opens.
9. If necessary, select the path to the target OS computer in the "Settings: Download OS" dialog box.
   The path that you already set in the object properties for this OS is always shown in this dialog box.

10. Activate the "The entire WinCC project" option if you want to download the entire project to the target computer.
    Activate the "Changes" option if you have configured changes and want to download these changes.

NOTICE
If you cancel the "Download changes" function, only a complete download will then be possible.

Note

Once you have executed the "Download entire project" function, the "Changes" option button is automatically selected to prevent you from downloading the entire project by mistake.

11. Click "OK".
12. Repeat steps 5 to 11 for all other operator stations you want to download.
13. Click "Start".
    The download is started and a progress bar informs you about the current status of the download.

18.5 How to download an individual OS

Introduction

The "Download entire project" and "Download changes" functions for an individual OS are performed the same way in principle.

Procedure

1. In SIMATIC Manager, open either the component view or the plant view.
2. In the tree view, select the object you want to download and select the menu command **PLC > Download**.
   The "Compile and Download Objects" dialog box opens.
3. Define the scope of data that you want to download:
   – Activate the "The entire WinCC project" option if you want to download the entire OS.
   – Activate "Changes" option if you want to download the changes.

   Note

   Once you have run the "Download entire project" function once, the "Changes" option button is automatically activated to prevent you from downloading the entire project by mistake.

4. Click "OK".
   The download starts.

18.6 How to activate a project

Introduction

The following description applies to activating a project on an OS server and on an OS client.

Procedure

1. Open WinCC Explorer on the OS you want to activate.

   Note

   Activate the operator stations directly on the associated computer. It is not possible to activate an OS via the engineering station.

2. Select the menu command **File > Open**.
3. Navigate in the file system to the ".../[project path]/[name of OS]" folder which contains the corresponding "*.mcp" file.
4. Click "Open".
   The project opens.

   Note

   You open the last opened project when WinCC Explorer is reopened.

5. Select the menu command **File > Activate**.
   Process mode is activated.

18.7 Archiving with Process Historian

After the "Process Historian" PC station starts, the Process Historian is ready for operation.

You can find additional information on this in the *Process Historian* manual.

Downloading project changes 19

19.1 Background information about "Download changes" function

Requirement

In order for you to be able to use the "Download changes" function, you must have compiled and downloaded the entire project once.

Important information on downloading changes

NOTICE
Never make changes to a project directly on the OS because this will prevent you from being able to use the "Download changes" function and you will have to download the entire project

Note

There is a temporary data inconsistency between AS and OS data while the "Download changes" function is being executed.

For this reason, you should first download the modified data to the automation system before downloading it to the OS. This reduces the length of time that the data are inconsistent.

Automatic updating of the OS clients when downloading changes

The server data are automatically updated by the "Download changes" function. The OS clients automatically receive the current data after changes are downloaded, so that the server data do not have to be explicitly downloaded.

If an OS client is not in process mode when you execute the "Download changes" function make sure of the following at the startup of this OS client: Process mode must be activated on all OS servers from which the OS client has server data. This allows the data on the OS client to be updated.

Downloading changes and redundancy

For safety reasons, downloading redundant OS servers is not performed simultaneously:

First of all, the partner station with the configured application "WinCC Application (stby)" is downloaded. Once this downloaded has been successfully completed, the partner station with the configured application "WinCC Application" is downloaded.

Note

The "Download changes" function on a redundant OS server can only be performed if both partner stations are in process mode (Runtime).

Downloading changes on a single station system

With a single station system (OS and ES on the same PC station) you do not need to download the OS, because all the data are already available locally. In this case it is adequate to run the "Compile OS" function. Similar to the "Download changes" function, you can run the "Compile changes" function for a single station system without ending process mode on the OS.

Downloading changes in the case of a single station system with reference OS

If you have created operator stations as the reference OS, be aware of the following:

NOTICE

If you download a change, you must always download this change to all operator stations (basic OS and the associated reference OS).

Before the "Download changes" function is run again, **all** operator stations must have the current project configuration status loaded. If you do not do this for a reference OS, the "Download entire project" function must be run for this reference OS.

19.2 Download changes

Overview of changes

Below is an overview of where you can make changes that can be transferred with the "Download changes" function.

- Changes in the plant view (Page 314)
- Changes in the component view (Page 315)
- Changes in CFC/SFCs (Page 316)
- Changes in blocks and block instances (Page 317)
- Changes in WinCC Explorer (Page 318)

19.3 Project changes in the plant view

Downloading changes without stopping the OS

You can download the following changes in the plant view without having to stop the OS:

- Insertion of a folder in the plant view
- Relocation of a folder to the plant view
- Copying of a folder to the plant view
- Renaming and deleting of a folder in the plant view if it is a component of the higher level designation (HID)
- Renaming of the picture for the OS
- Subsequent activation of the "Derive Picture Hierarchy from the Plant Hierarchy" setting
- Renaming of the OS area
- Modification of the plant hierarchy level for the OS area
- Modification of the AS assignment and forwarding of the change to all lower-level objects
- Modification of the OS assignment and forwarding of the change to all lower-level objects
- Renaming, insertion, deletion, and modification of OS pictures
- Renaming, insertion, deletion, and modification of OS reports

19.4 Project changes in the component view

Downloading changes without stopping the OS

You can download the following changes in the component view without having to stop the OS:

- Renaming, insertion, relocation, and deletion of the AS
- Renaming, insertion, relocation, and deletion of the S7 program

Note

When deleting an AS or an S7 program, tags and connections are not removed until a full compilation with memory reset is performed.

Note

Note that when an S7 program is renamed, the connection between the OS and AS is interrupted because the corresponding connection names have to be adapted in the database: "old" connection names are deleted and new connection names are registered.

19.5 Changes in CFC/SFCs

Downloading changes without stopping the OS

The following changes in charts can be downloaded without having to stop the OS:

- Renaming, insertion, and deletion of "Charts" folders
- Renaming, insertion, deletion, and modification of CFC charts
- Renaming, insertion, deletion, and modification of SFC charts

19.6 Changes in blocks and block instances

Downloading changes without stopping the OS

The following changes in blocks and block instances can be downloaded without having to stop the OS:

- Renaming of "Sources" and "Blocks" folders
- Insertion and deletion of a block
- Renaming of a block in the symbol table
- Modification of a block address in the symbol table
- Modification of a block number in the block folder
- Modification of control and monitoring attributes of blocks
- Modification of control and monitoring attributes of a block instance
- Renaming, insertion and deletion of block instances in CFCs
- Modification of message texts
- Modification of block interfaces of a block type, for example, addition or deletion of a name, data type, or I/Os

Note

If you change a block I/O at an AS block in process mode, a stop of the AS may be required. Whether or not an AS must be stopped depends on the CPU type used.

19.7 Changes in WinCC Explorer

Downloading changes without stopping the OS

The following list only contains the settings in the WinCC Explorer that can be defined in the PCS 7-environment. Any settings made by PCS 7 itself are not listed here. You can download changes to these settings without having to stop the OS:

- Configuration of archives (TagLogging)
- Configuration of reports (Report Designer)
- Programming of a script (Global Script)
- Editing of a text library
- Setting of user permissions
- Configuration of user archives
- Setting the time synchronization
- Setting the lifebeat monitoring
- OS Project Editor
- Horn
- Changes in process pictures and associated scripts
- Changes in SFC display properties

19.8 Download entire program

Downloading entire program with OS stop

In certain cases, you lose the option to run the "Download changes" function.

Note

After the following changes are made, you can no longer use the "Download changes" function. The "Download changes" function becomes available again only after you have downloaded the entire project again.

- Modification of the OS name
- Full compilation of the OS
- Modification of the path to the target computer
- Change to the master OS - standby OS assignment
- Modification of the configuration of redundant OS servers
- Modification of the OS project properties
- Modification of the hotkeys in the OS
- Downloading of server data from newly added OS servers to existing OS servers

If you perform one of the actions above, PCS 7 opens a message window to notify you that it is no longer possible to download changes if the action is performed.

Simulation of an OS

20

20.1 Simulation of an OS

Introduction

You can simulate the process mode of an OS from SIMATIC Manager. With this simulation, you can, for example, check the display and functionality of your configuration data.

Simulation of an OS

Note

Note the following:

- At the time of the simulation, there is no communication between the various operator stations of your project. As a result, no current data from other servers can be displayed, for example, the data of another OS server in an OnlineTrendControl.
- Communication between the OS and the AS can be simulated.
  Requirement:
  The OS – AS and ES – AS connections need S7 connections with identical parameter settings at the OS and ES ends:
  - Local ID (e.g. S7_connection_1)
  - Module name (e.g. WinCC appl.)

  You can find additional information about this in section "Configuring network connections for an OS (Page 49)".
- Note that operations which you carry out in the OS simulation have an impact on your process.

20.2 How to start the simulation

Procedure

1. In SIMATIC Manager, open the component view.
2. In the tree view, select the OS for which you want to simulate process mode.
3. Select the menu command **Options > OS > Start OS Simulation**.
   The OS configuration data is placed in a temporary directory. The process mode of the selected OS is simulated using this data.

Note

The next time a simulation starts, the data in the temporary directory will be updated.

While the OS is in simulation mode, you cannot make changes to the configuration data of the OS.

Using additional tools and editors 21

21.1 The "Text Library" editor in WinCC Explorer

21.1.1 Text library

Introduction

The Text Library is an editor in WinCC Explorer.

All of the texts that the plant operator sees in process mode are stored here in the installed languages. When a language is switched in process mode, the texts are displayed in the corresponding language.

Content of the text library

The following texts are stored in the text library, for example:

- Process control and system message texts, such as synchronous AS errors
- Chart and block designations
- Message texts from the block instances
- Unit and operator texts
- Texts from process pictures

Text library and PCS 7

In the PCS 7 environment, the text library content is automatically filled when the OS is compiled, thus eliminating the need for additional steps in this editor.

Note

You change the text library in the following exceptional case:

If you want to ensure that the unit and operator texts in the process pictures are also displayed in process mode in the language that the plant operator has set, edit the corresponding languages.
You can find additional information about this in section "How to change unit and operator texts in foreign languages (Page 325)".

Set the same language for the OS client and OS server in process mode so that the texts of the faceplates are displayed in the correct language.
You can find additional information about this in section "How to set the language in WinCC Explorer (Page 38)".

Managing multilingual texts in the "Text Library" editor

In order to switch languages in process control, all texts must be stored in the corresponding languages in the text library.

You can find additional information about this in section "How to manage multilingual texts (Page 98)".

21.1.2 Relationship between OS compilation and the text library

Introduction

If you have to change the text library because you want to implement the unit or operator texts in different languages, note the following:

When the OS is compile, the column with the language is always used as a reference in the text library. This reference is set as the "Standard language for display devices" in SIMATIC Manager.
You can find additional information about this in section: "How to set the language in SIMATIC Manager (Page 37)".

Example

An operator text is defined as follows, for example: "S7_String0 = Aus" (off).

- German is the set as the "standard language for display devices" in SIMATIC Manager: When the OS is compiled, the text "Aus" (off) is entered in all five columns of the text library.
- You change the entry "Aus" to "Off" in the English column in the text library.
- The following happens, depending on the "Standard language for display devices":

"Standard language for display devices":	… then
German	• the reference column is "German" • the entry "Aus" is already present • no new entry is created
English	• the reference column is "English" • an entry "Aus" is not present – this entry has been changed to "Off". • a new line is inserted – "Aus" is entered in the columns for all languages, and manual changes are lost.

Rule

The texts in the text library in WinCC Explorer are automatically entered by PCS 7. Change the texts only if you have adapted unit and operator texts. In this case, take note of the following:

NOTICE
If you recompile the OS, you must not switch the "Default language for display devices" in SIMATIC Manager. In this case, entries which have already been compiled may be overwritten.

21.1.3 How to change unit and operator texts in foreign languages

Requirements

- The unit and operator texts in SIMATIC Manager are adapted in the block types.
- The unit and operator texts in SIMATIC Manager are adapted in the block instances.
- The OS has been compiled in SIMATIC Manager.

Procedure

1. In the WinCC Explorer tree view, select the "Text Library" editor and select the menu command **Open** in the shortcut menu.
   The "Text Library" editor opens.
2. Select the menu command **Edit > Find**.
3. Enter the unit and operator text of the block type In the "Search for" text field.
4. Click "Find Next".
   The table field with the desired term is displayed in the text library.
5. Enter the desired translations in the columns for the foreign languages.

6. Press the Enter key.
   The term is transferred.
7. If you want to translate several unit and operator texts, repeat steps 3 through 6.
8. Select the menu command **File > Exit**.

Editing entries in an external program

Note

Alternatively, you can edit the entries of the text library in an external program, such as MS Excel.

1. Export the data to a CSV file using the menu command **File > Export**.
2. Edit the data.
3. Select the menu command **File > Import**.
   The edited data are imported.

21.2 Operator control and monitoring of the process mode via the Internet or an intranet

Web Option for OS

The Web Option for OS enables you to use OS for operator control and monitoring functions over the Internet or an intranet in process mode. You require additional PCS 7 components for this.

Note

Some functions are not available or are restricted.

The following functions are basically available with the Web option for OS:

- Operator control and monitoring functions which are also used on an OS client
- Message lists which are opened user-dependently in exactly the same way as on an OS client. Messages can be acknowledged user-dependently.
- Display of picture hierarchy corresponding to the plant hierarchy
- Group display functions including the "Loop-in-Alarm" function
- Extended status display
- Audible alarm indication

Additional information

Process Control System PCS 7; Web Option for OS manual

- Information on the configuration of the PC stations
- Availability of functions
- Additional information

21.3 Programming with scripts

21.3.1 Function of global script

Introduction

Global Script allows you to program actions and functions that are called on the operator stations in process control.

For example, you can use an action from an "analog value display" (graphic object) to change the color based on a tag.

Actions and functions

Actions and functions programmed as a global script can be used within a project or across projects.

Actions are called cyclically depending on their trigger during process control. You can program actions as follows:

- At properties of graphic objects
- At events that occur on a graphic object
- Globally in the project

Functions are called within actions or other functions.

Programming languages in Global Script

Global Script provides two programming languages:

- C script
- VB script

You can use VB and C scripts simultaneously in separate actions within a project or a process picture. However, you cannot call C scripts from VB scripts or vice versa.

You can use both languages to program the following:

- Actions and procedures not dependent on pictures in the "Global Script" editor
- Actions and procedures dependent on pictures for dynamizations of graphic objects in the Graphics Designer

Additional information

- Online help for *WinCC Information System*

21.3.2 Global Script - Programming with C script

Introduction

Programming with C Script is used in the following cases:

- PCS 7 provides preprogrammed standard and internal functions.
- You can program specific project and standard functions with C script.
- You can create actions that run in the background in process mode.

Note

Note that actions are processed interpretively. The use of a large number of actions or very complex actions results in a higher system load. Moreover, many small actions cause more system load than a few large actions. You should replace extensive actions with custom DLLs (Dynamic Link Libraries).

Move cyclic computing operations to the automation system and avoid executing them on the OS.

Location of the programming

If you want to use actions and functions that go beyond the standard ones, you can program them in the WinCC Explorer at two locations:

- WinCC Editor "Global Script"
- WinCC "Graphics Designer" editor: at properties or events of graphic objects that are stored in the picture

Additional information

- Online help for *WinCC Information System*

21.3.3 Global Script - Programming with VB Script

Overview

You can use VB scripts to program operator control and monitoring functions. VB scripts are executed in process mode.

Operator control functions

Operator control functions enable the plant operator to access graphical objects and tags in process mode. Examples of operator control functions are:

- Defining setpoints for tags
- Switching the language for a graphical object

Monitoring functions

To facilitate process monitoring for the plant operator, you can use VB Script to implement displays such as the following:

- Display of cyclic operations, for example, through flashing or color changes
- Display of process tag states, such as "Motor ON"

Location of the programming

If you wish to use functions and actions that go beyond the standard ones, you can program them in the WinCC Explorer at two locations:

- WinCC Editor "Global Script"
- WinCC "Graphics Designer" editor: at properties or events of graphic objects that are stored in the picture

Additional information

- Online help for *WinCC Information System*

21.3.4 Programming with VBA

You can use VBA to adapt the Graphics Designer to your own requirements. This allows you to simplify and automate the configuration process.

VBA is integrated in the Graphics Designer. Examples of available options are:

- Creation of user-defined menus and toolbars for adapting the Graphics Designer interface to your individual requirements.
- Creation of VBA macros for mouse-activated configuration tasks, for example, settings for levels and editing of objects. A VBA macro for editing objects enables you to quickly create a large number of objects with identical properties.

Additional information

- Online help for *WinCC Information System*

21.4 Overview of additional tools

21.4.1 Additional tools for OS

Diagnostic tools

The OS of PCS 7 provides with a few additional diagnostic tools.

You can find information about this in the manual *Process Control System PCS 7; Service Support and Diagnostics*.

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