SIEMENS

SIMATIC

Process Control System PCS 7 Operator Station (V7.1)

Configuration Manual

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03/2009
A5E02122464-01

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A5E02122464-01
℗ 01/2009

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Preface

1

Purpose of this Documentation

This documentation contains all the information on configuring the PCS 7 operator station, the HMI system in 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.

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.

Validity of the Documentation

This documentation is valid for the *Process Control System; PCS 7 Toolset* software package, V7.1 or higher.

Readme File

Current higher-level information can be read in the Readme file:

- The Readme file can be found on the DVD *Process Control System; PCS 7 Toolset*.
- You can also open the Readme file after you installed PCS 7 by selecting the **Start > SIMATIC > Product Info > <language*> > PCS 7 Readme** command.
  * Select your regional **<language>**.

Conventions

In this documentation the designations of elements of the user 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.

Changes Compared with the Previous Version

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

- User interface display
  For further information, refer to the section titled "How to define the global design (Page 107)".
- OS Project Editor
  - The obligation to acknowledge for all messages of the "tolerance" message class can be disabled or enabled
    For further information, refer to chapter "Overview of OS Project Editor (Page 110)".
- Provision of data for the WinCC add-on "Alarm Control Center (ACC)"
  For further information, refer to the section titled "WinCC add-on "Alarm Control Center (Page 335)".

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 steps 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 context menu for the individual objects.

Additional documentation

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

- Online Help for the *WinCC Information System* Then 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; PC Configuration and Authorization*: 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.

PCS 7 Glossary

You will find a PCS 7 glossary containing definitions of important technical terms used in this documentation on the DVD *SIMATIC PCS 7; Manual Collection* or in the PCS 7 software via the SIMATIC Manager Help menu (menu command **Help > Contents >** "Glossary" button).

Further Support

If you have any technical questions, please get in touch with your Siemens representative or responsible agent.

You will find your contact person at:

http://www.siemens.com/automation/partner

You will find a guide to the technical documentation offered for the individual SIMATIC Products and Systems at:

http://www.siemens.com/simatic-tech-doku-portal

The online catalog and order system is found under:

http://mall.automation.siemens.com/

Training Centers

Siemens offers a number of training courses to familiarize you with the Process Control System SIMATIC PCS 7. Please contact your regional training center or our central training center in D 90327 Nuremberg, Germany for details:

Telephone: +49 (911) 895-3200 *)

Internet: http://www.sitrain.com

Technical Support

You can reach the Technical Support for all Industry Automation and Drive Technology products

- Via the Web formula for the Support Request
  http://www.siemens.com/automation/support-request
- Phone: + 49 180 5050 222 *)
- Fax: + 49 180 5050 223 *)

Additional information about our Technical Support can be found on the Internet pages
http://www.siemens.com/automation/service

Service & Support on the Internet

In addition to our documentation, we offer our Know-how online on the internet at:

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where you will find the following:

- The newsletter, which constantly provides you with up-to-date information on your products.
- The right documents via our Search function in Service & Support.
- A forum, where users and experts from all over the world exchange their experiences.
- Your local representative for Industry Automation and Drive Technology.
- Information on field service, repairs, spare parts and consulting.

*) Please note the following if you call the phone number listed: You may incur costs which vary from the standard costs for land lines. Calls from a cellular network may be more expensive.

The PCS 7 Operator Station

2

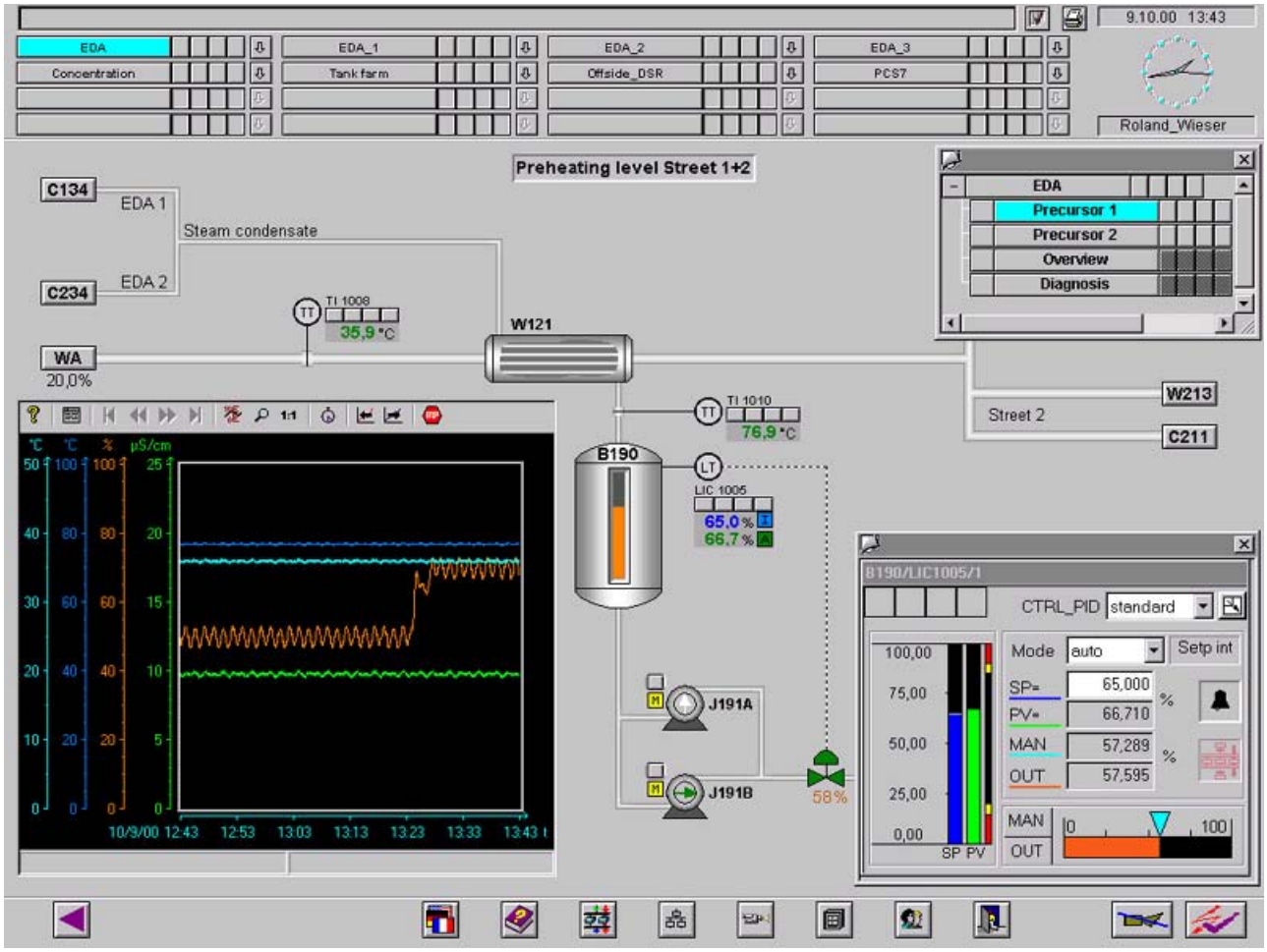
2.1 Overview of the PCS 7 Operator Station

Operator Station in Process Mode

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

You monitor and control the PCS 7 system in process control by means of process pictures. 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 in the form of trends plotting signal 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 indicate the technological structure of a PCS 7 plant through the configuration of the plant in PCS 7.
The OS is configured in two steps on an engineering station (ES):

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

This documentation contains **all the 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 further information about this in the section "Configuration and User-Interface Languages (Page 33)".

Additional information

You can find **all the information on operating the OS in process mode** in the *Process Control System PCS 7; OS Process Control* manual.

2.2 Structure of the PCS 7 Operator Station

Operator Station

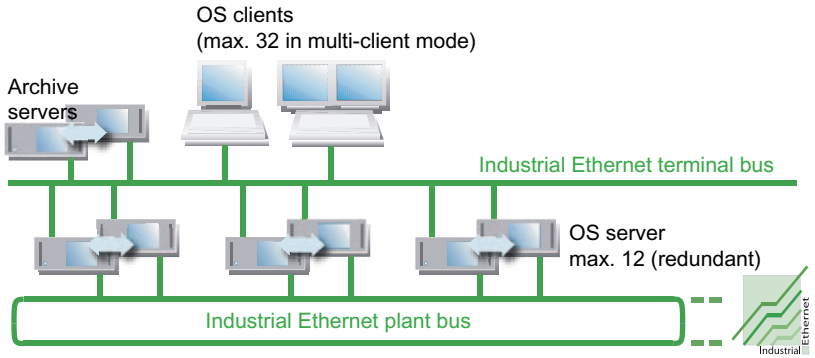
Operator stations are PCs on which the PCS 7 OS software is installed. The operator station is connected to the plant bus to allow data communication with the automation system.

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 multi-user system with client-server architecture.

The OS server contains all the data of the operating and monitoring systems and the interrupt and measured-value archive. 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 from one or more OS servers.

We recommend setting up a terminal bus (separate from the plant bus) for data communication between OS clients and the OS server in multi-user 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 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 on the plant bus can be used in parallel with other single or multi-user systems.

  Two OS single stations 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 multi-user system with client-server architecture:

  The OS multi-user 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) from 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 further information on server-to-server communication in the section "Creating and Downloading Server Data (Page 347)".

  The *PCS 7 Server Redundancy* software package facilitates redundant operation of the OS servers.

  A maximum of 4 monitors can be connected to an operator station (OS client) using a multi-VGA card. Sections of the plant that have been split up in this way can be managed using 1 keyboard and 1 mouse.

Central archive server

For the long-term archiving of data, it is also possible to use a central archive server (CAS) on a separate PC station. The central archive server is a node on the terminal bus and is not connected to the plant bus.

There is further information available on this in the section "Plant Configuration with a Central Archive Server (Page 245)".

Maintenance station (asset management)

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

You can find information about this in the section "Using the PCS 7 Maintenance Station (Page 289)".

OS Web Option for a multi-user system

The following configuration is used in PCS 7:

- PCS 7 Web Server and WebNavigator Client
- PCS 7 Web Standard Server and WebNavigator Client
- PCS 7 Web Diagnostics Server and WebNavigator Diagnostics Client

Further information is available in the *Process Control System PCS 7; OS Web Option* manual.

Redundant operator station

In the case of a redundant setup, design the OS server for redundant use. Each OS client can access up to 12 redundant OS server pairs. If you use multi-VGA cards in the OS clients, you can connect several process monitors per OS client. This reduces the number of OS clients per OS server pair.

Further information

- *Process Control System PCS 7; Fault-tolerant Process Control Systems* manual.

2.3 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 supports simultaneous access of an OS server to several other OS servers (Server-Server communication).
For further information on Server-Server communication, refer to the section "Creating and downloading server data (Page 347)".

OS clients

OS clients are used in process mode for operator control and monitoring. OS clients access the data of the OS servers and display these data, enabling the process to be controlled. Data from more than one OS server can be shown in a process picture displayed on the OS client.

You can connect up to four process monitors to an OS client. This requires the use of multi-VGA cards.

Introduction to OS configuration

3

3.1 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 the SIMATIC Manager and in WinCC Explorer:

- 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

In the SIMATIC Manager you define the Plant Hierarchy of your PCS 7 system. Important functions of the OS are based on this Plant Hierarchy:

- In process mode the Plant Hierarchy is mapped in the overview area.
  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 which you assign in the Plant Hierarchy are automatically copied 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 controllable and observable blocks which you can use, for example in CFC charts. Block icons are graphic representations of blocks and are automatically inserted by PCS 7 in the process pictures.
- PCS 7 provides convenient picture blocks which the plant operator can use to control and observe measuring points.
- When you insert objects in process pictures, you can easily and directly interconnect them with blocks which you previously used in CFC charts, for example.
- The PCS 7 Wizards provide convenient help for the dynamic representation of objects in process pictures.

Adherence to quantity frameworks

Note

When configuring the OS be sure to adhere to the permitted quantity frameworks for PCS 7.

- Information about permitted quantity frameworks is available in the *Process Control System PCS 7; Engineering System* manual.
- Information about identifying process objects during configuration is available in the *Process Control System PCS 7; PC Configuration and Authorization* manual.

3.2 Overview of Configuration Tasks in SIMATIC Manager

Introduction

The following provides you with an overview of the individual configuration tasks required in SIMATIC Manager. The steps are listed in the overview tables in the recommended order. Detailed information on all engineering tasks is provided in the next sections.

Configuration of the hardware and connections

Configuration tasks	Must	Optional
Inserting and configuring an OS		X If you require additional operator stations. The PCS 7 Wizard automatically creates an OS.
Configuring network connections for an OS	X	

OS configurations in SIMATIC Manager

Configuration tasks	Must	Optional
Providing projects with access protection		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
Configuring messages		X If you want to define messages that deviate from the standard
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 in the overview area
Specifying the hiding of messages with "Alarm Hiding"		X If you wish to hide individual messages at a certain point in time
Defining the plant designation	X	
Defining the OS area identifier	X Plant hierarchy	X Control and monitoring attributes

Configuration tasks	Must	Optional
Defining picture names and picture hierarchy		X If you want to define picture names that deviate from the standard
Setting the update routines: • Updating the AS-OS connections • Updating the OS area identifier		X
Specifying the compilation mode	X	
Compiling the OS	X	

On completion of all configuration tasks

Step	Must	Optional
Downloading the OS	X	

3.3 Overview of Configuration Tasks in WinCC Explorer

The table below provides you with an overview of the individual configuration tasks required in WinCC Explorer. The steps are listed in the overview tables in the recommended order. You can find detailed information about each individual configuration tasks in the following sections.

OS configurations in WinCC Explorer

Configuration tasks	Must	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
Setting up user permissions	X	
Visualizing a plant – basics: • Inserting dynamic objects • Using a status display • Using an expanded status display • Inserting an I/O field • Engineering and configuring a group display	X Using the required 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 parameters for the alarm system: • Definitions in the OS Project editor • Settings in the Alarm Logging editor • Configuring the message lists • Configuring the acoustic signaling device		X
Configuring archives and logs	X	
Configuring a central archive server		X When you use the Central Archive Server option.
Setting the • Time-of-Day Synchronization • Sign-of-life monitoring	X	X

Configuration tasks	Must	Optional
Setting up the PCS 7 maintenance station		X
Simulation of the OS on the ES		X

Task performed directly on the OS servers/OS clients themselves after downloading the project

Step	Must	Optional
Activating the project	X	

3.4 Using a reference OS

Introduction

If you want to use multiple operator stations based on the same configuration, we recommend that you configure reference operator stations (reference OS). A reference OS makes use of another OS (base OS).

Configuration of the base OS includes the complete configuration of an OS in the SIMATIC Manager and in the WinCC Explorer. Configuring the reference OS involves the following steps:

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

Possible applications for a reference OS

You use a reference OS in the following scenarios:

- If you are operating a number of OS single station systems with identical projects.
- You use the OS reference if you are operating a number of OS clients with identical projects.

Note

The following applies to a multiproject:

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

Further 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)"

3.5 Access protection

Providing projects with access protection

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.

Additional information is available in the *Process Control System PCS 7; Engineering System* manual.

Access protection in process mode

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

- Access protection via settings in WinCC Explorer (User Administrator)
  Additional information on this subject is available in the following documentation
  - Online help for *WinCC Information System*, under the topic "User Administrator"
- Access protection via SIMATIC Logon
  Additional information on this subject is available in the following documentation:
  - Online help for *SIMATIC Logon*
  - Online Help for *WinCC Information System*

3.6 Managing Projects

Project management functions

The following functions are available for managing PCS 7 projects:

Function	Description
Archiving and dearchiving	You can store (archive) all information of a project at a certain point in time in a compressed (archive) file. Dearchiving is the restoration of a project from a compressed (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 compile 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 languages

4

4.1 Configuration and User Interface Languages

OS language settings

The following language settings are of relevance as far as the OS is concerned:

- Languages for the operating system
  - Operating system language without a multilingual package
    If only one language is used, select this language for process control and for engineering.
  - Language of the operating system with multilingual package
    Select a multilingual operating system (default is English) and also install the additional Multilingual User Interface Packs if several languages are used.
  - Language of the operating system of PCS 7 bundle PCs
    The PCS 7 bundle PCs are supplied with a multilingual operating system. The default language is English; the multilingual packages which include German, French, Italian and Spanish are installed.

  Additional information pertaining to operating system installation, languages and language changes is available in the *Process Control System PCS 7; PC Configuration and Authorization* manual.
- Engineering language
  The regional language of the menus and dialogs, dialog boxes and help texts of PCS 7 is the engineering language.
  The corresponding settings are made in SIMATIC Manager and WinCC Explorer.
- Process control language
  This is the language which is used to display texts within the process control system.
  The corresponding settings are made in SIMATIC Manager and WinCC Explorer.

Overview of available languages

The language switchover depends on the PCS 7 installation.

Table 4- 1 European version on PCS 7

Language	Engineering language	Process control language
English	X	X
German	X	X
French	X	X
Italian	X	X
Spanish	X	X

Table 4- 2 Chinese version of PCS 7

Language	Engineering language	Process control language
English	X	X
Chinese	X	X

Overview of the Steps in Configuration

Configuration of the languages for configuration tasks and the user interface includes the following topics:

- Setting the languages in the SIMATIC Manager (Page 35)
- Setting the languages in the WinCC Explorer (Page 36)

4.2 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 the SIMATIC Manager
- Language for display devices
  You can select the language for the translation of operator-relevant texts. You can also set a default language in which all texts and messages are displayed.

Setting the configuration language

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 process control languages

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

1. Select the menu option
   Options > Language for Display Devices menu command in the SIMATIC Manager.
2. If you wish to add other languages to those installed in the project, select the language in the "Available languages" group and click the "-->" button.
3. If you wish to delete one of the languages installed in the project, select the language in the "Languages installed in the project" group and click the "<--" button.
4. If you wish to change the default language, select the language in the "Languages installed in the project" group and click "Default".
5. Click "OK".

Managing multilingual texts

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

There is further information available on this in the section "How to Manage Multilingual Texts (Page 99)".

4.3 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 the language for the translation of 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 **Options > Language…** .
2. Choose one of the languages shown in the list.
3. Click "OK".

Setting the process control language

1. In WinCC Explorer in the tree view mark the "computer" object and select the menu command **Edit > Object properties**.
2. Click "Properties".
3. Select the "Parameters" tab.
4. Choose the process control language from the "Runtime language setting" drop-down list.
5. Choose the process control language from the "Runtime default language" drop-down list.

   Note

   The runtime default language 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 "Runtime language setting".

6. Click "OK".

Configuring OS data in SIMATIC Manager

5

5.1 Configuring the hardware

5.1.1 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 "Structure 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 steps 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 and 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 destination 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	SIMATIC Manager

Hardware configuration for a reference OS

Creating and configuring the reference OS involves the following:

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

Further information

- Manual *Process Control System PCS 7; Engineering System*
- *Process Control System PCS 7; Fault-tolerant Process Control Systems* manual
- *Process Control System PCS 7; PC Configuration and Authorization* manual

5.1.2 Setting up the PC Stations

Settings on all PC stations

In order to configure, download, and test all automation systems (AS) and PC stations (such as OS and BATCH) from a central engineering station (ES) in a PCS 7 project, you must perform 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

Perform these settings first on the central engineering station.

Further information

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

5.1.3 Introduction to OS Configuration

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 will already have been inserted, if you activated the relevant option. You can insert additional operator stations as follows:

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

Overview of the Steps in Configuration

Creating and configuring an OS involves the following:

- Engineering and configuring the OS (Page 40)
- Setting the OS properties (Page 43)
- Creating the path for loading the target OS and specifying the standby OS (Page 44)

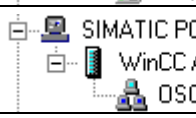
Optional:

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

5.1.4 How to engineer and 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 the SIMATIC Manager
OS server or OS single station system	WinCC application	
Reference OS single station	WinCC application ref	
Standby OS server or standby OS single station system	WinCC application (stby)	
OS client	WinCC application client	
Reference OS client	WinCC appl. Client ref	
Central archive server	WinCC CAS appl.	
Standby central archive server	WinCC CAS appl. (stby)	

Procedure

1. In the component view of SIMATIC Manager, select the project where you want to add the operator station.
2. Select the **Insert > Station > SIMATIC PC Station** command. A new SIMATIC PC station is inserted into 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 open HW Config by double-clicking the "Configuration" object in the detailed view.
   The hardware configuration of the SIMATIC PC station opens.
5. If the hardware catalog is not visible, select the **View > Catalog** command to open the hardware catalog.
6. Insert the requisite hardware component:
   - Under "SIMATIC PC Station > CP Industrial Ethernet" select the communications processor installed in the SIMATIC PC station and drag it into the PC station.
   - If you are using a standard network card, 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 card (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.
   - In the case of a network card which is connected to the plant bus via BCE, set the "Interval" to "30" in the "Send keep alive for connections" group of the "Options" tab. Enter the name in the "General" tab.

NOTICE

You must use the ISO protocol:

- For operator stations that are communicating with redundant automation systems
- For operator stations for which the time synchronization takes place with BCE

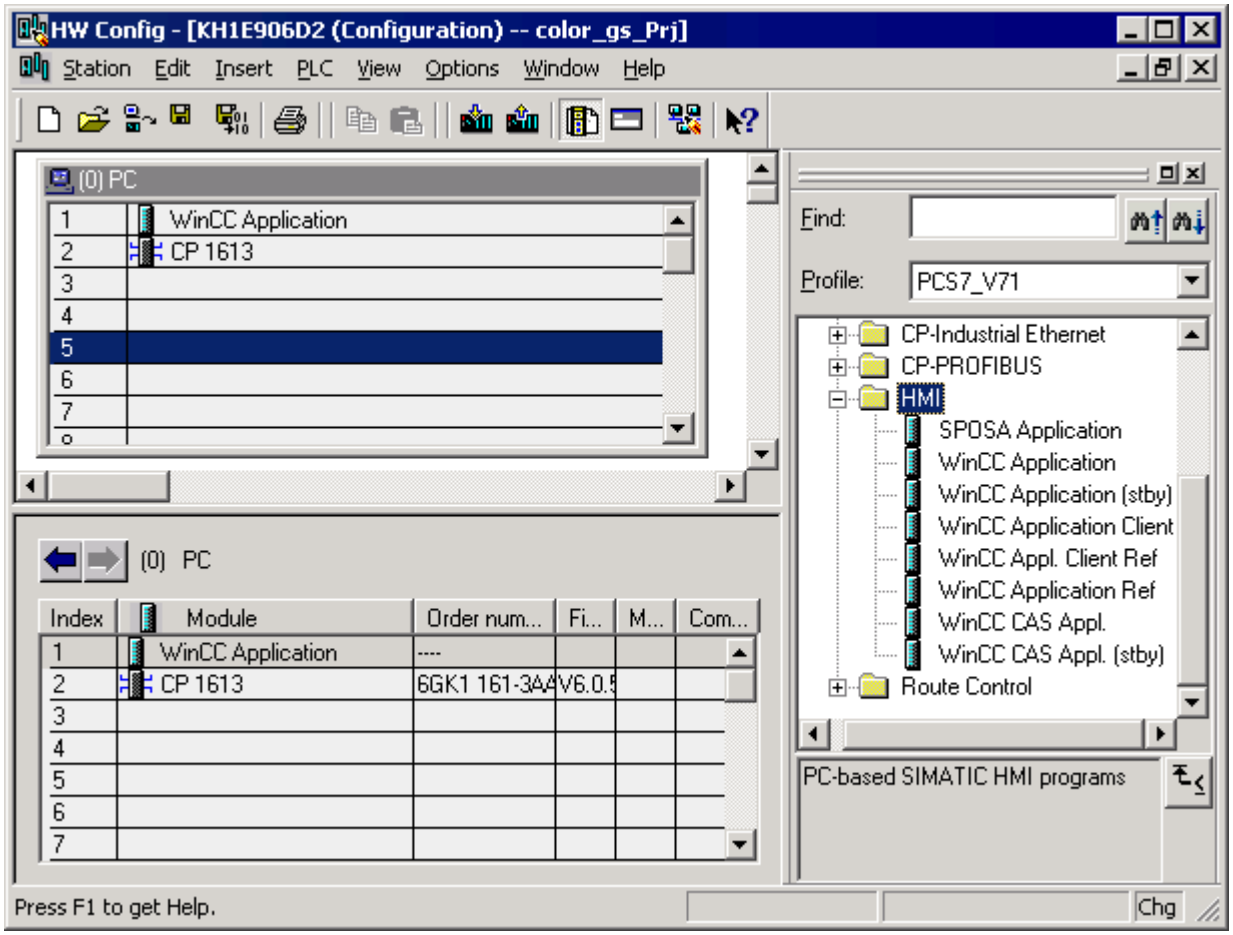
N.B. You must always use the same protocol for all the network modules which are connected to a plant bus.

For reasons of performance, avoid using the TCP/IP and ISO protocols simultaneously within a plant.

Note

- If you use the "ISO" log, set the MAC address.
- If you use the "TCP/IP" log, 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 there are one or more subnets in existence, mark the required 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 required WinCC application and drag it into the configuration table: Refer to the table in the introduction in this regard.



11. Select the **Station > Save** command.
    An OS displayed in the SIMATIC Manager is automatically created in the background. Other configurations can be defined in the WinCC Explorer for this OS.
12. Repeat steps 1 to 11 if you wish to install any additional operator stations.

5.1.5 How to Set the Properties of the OS

Introduction

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

- Name of PC station
- Name of OS

Procedure

1. In the SIMATIC Manager component view, select the object from the list below to which you want to assign a name or whose name you want to change:
   - SIMATIC PC station
   - OS
2. Select the **Edit > Object properties** command.
   The "Properties – SIMATIC PC Station" dialog box opens.
3. Enter the relevant name in the "Name" input box.
   Assign short, descriptive names which return brief information about the function of the PC station with the overall system.
4. Enter the additional information in the following input boxes as needed:
   - "Author"
   - "Comment"
5. Click "OK".
   The name of the PC station or OS is updated in the tree view.

5.1.6 How to Specify the Path for Loading the Destination 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	All: • Specify the destination OS (path to destination computer) Redundant OS server: • Assign the standby OS With a reference OS client and reference OS single station system: • Assign the base OS

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 destination and standby operator stations using basic Windows functions.

Procedure

1. In the SIMATIC Manager component view, below the SIMATIC PC station, select the OS for which you want to specify a path to the destination 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" input box and enter the path to the target OS.
   The target OS computer is the computer on which you wish to run the project.

NOTICE
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 a corresponding 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 wish to have archive tags created automatically with the corresponding system archive, enable the "Create/update archive tags" checkbox.
7. If you use a central archive server in your project and want to swap out data to the central archive server, enable the "Export to central archive server" checkbox.

   Note

   You can only enable this checkbox if you have inserted a central archive server in your project.

   You can find information about archiving and the central archive server in the section "Plant Configuration with a Central Archive Server (Page 245)".
8. Click "OK".
   The settings are complete.

5.1.7 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 the SIMATIC Manager create a number of SIMATIC PC stations (reference OS) of the type "WinCC Application Ref" equal to the number of single station systems of the same type that you want.
   Create the hardware of the reference OS in the same way as the hardware of the base OS.
   You can find additional information about this in the section "How to engineer and configure an OS (Page 40)".
2. In SIMATIC Manager, select the reference OS.
3. Select the menu command **Edit > Object Properties**.
4. Select the "OS ref" tab. Options for OS reference objects".
5. Select the base OS from the drop-down list.
6. Enter the path for the target OS computer.
   For more information, refer to the section titled "How to define the standby OS and the path for downloading the target OS (Page 44)".
7. Click "OK".

5.1.8 How to Configure a Reference OS for an OS client

Requirement

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

Procedure

1. Create a number of SIMATIC PC stations (reference OS) of the type "WinCC Appl. Client Ref" equal to the number of OS clients of the same type that you want.
   Create the hardware of the reference OS in the same way as the hardware of the base OS.
   You can find additional information about this in the section "How to engineer and configure an OS (Page 40)".
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.
   For more information, refer to the section titled "How to define the standby OS and the path for downloading the target OS (Page 44)".
7. Click "OK".

5.2 Configuring the communication paths

5.2.1 Configuring Network Connections for an OS

Introduction

The communications connections for PC stations are configured in NetPro. All operator stations must have already been created in SIMATIC Manager.

You must configure the following connections:

- OS – AS
- ES – AS

Note

To avoid configuration errors when configuring connections, always start with the OS.

5.2.2 How to Configure an OS Network Connection

Requirement

All the 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 SIMATIC Manager component view, select the project that is to have the network inserted.
2. Select the **Options > Configure networks** command.
   NetPro opens and shows all SIMATIC station 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 you wish to appear on the OS, as the connection partner in the tree view.

4. Select the requisite connection from the "Connection" drop-down list.
   - If you wish to create a connection with a "single" station, select the "S7 connection".
   - If you wish to create a connection with an H-station, select "S7 connection fault-tolerant".
5. If necessary, enable the "Display properties before inserting" checkbox.
   This enables you to define settings or changes on 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 the other operator stations.

Configuring the ES - AS connection

Configure this connection so as to enable you to test the complete functionality of your configuration from the engineering station (ES).

1. In NetPro, select the ES 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 as the connection partner in the tree view.
   The corresponding data appears in the lower pane of the dialog box.
4. Select the requisite 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".

NOTICE
Ensure that the symbolic names of each connection (OS - AS, ES - AS) are identical. This is the only way in which you can simulate the OS on the engineering station for the purposes of testing all the functions following completion of the configuration.

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 in the current project > Selected stations**.

Further information

- Online Help on the dialog boxes

5.2.3 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
  - 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 the 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 **Edit > Open object** command.
   The "HW Config - [Name of PC station] (configuration) - - V7.1" dialog box opens.
3. On the OS in the Windows start menu select the **Start > Component configurator** command.
4. Compare the list entries in HW Config on the ES and in the component configurator 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 component configurator on the OS.
5. Make any necessary corrections by dragging the list entry in the component configurator 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 component configurator on the OS in the "Status" column. The symbol must denote the status "Component is ready for service"  .
   If this symbol is not displayed, find further information in the online help of the dialog box.

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
  - OS server

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

1. Select in HW Config 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 keep alive 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 **Station > Save and Compile** command.
7. Once the compilation process has been completed, select the **Station > Exit** command. 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
  - OS server

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

1. In the Windows start menu select the **Start > SIMATIC > SIMATIC NET > Configure PC station** command.
   The "Configure PC Station" configuration console opens.
2. In the tree view under "Modules" select the network module with which you want 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

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. On the ES in the component view of the SIMATIC Manager 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. On the ES in the component view of the SIMATIC Manager 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 component configurator on the OS in the "Status" column.
   The symbol must denote the status "Component is ready for service" .
   If the "Configuration inconsistent" icon is shown on account of a change in the IP address, for example, the OS computer has to be restarted.
   If neither of these two symbols is displayed, find further information in the online help of the dialog box.

5.3 Global and Specific Settings

5.3.1 Overview of Global and Specific Settings

Introduction

In addition to the hardware configuration, other settings are required in SIMATIC Manager to configure the PCS 7 OS. These settings are made in two places:

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

Both options are presented in the description of the various settings.

5.3.2 Global Setting Options

Purpose of the global settings

Global settings apply to the entire project. These settings are used to 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)	Use the "Included in HID" setting to specify that the HID is automatically formed from the names of the hierarchy folders.
OS Area Identifier	Use the "OS area" setting to define the selected level as the OS area and to accept it in the area identifier. The definition of an OS area is necessary for area-specific messages in process mode.
Basing the Picture hierarchy on the plant hierarchy	The picture hierarchy from the plant view is transferred to the PCS 7 OS Picture Tree Manager.

5.3.3 Specific Setting Options

Purpose of specific settings

The specific settings made in the "System attributes for operator control and monitoring" tab of the object properties are important for process control by the plant operator. You can use these attributes to modify the global settings, particularly for individual hierarchy folders.

Setting options

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

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

5.3.4 Defining the plant designation

5.3.4.1 Higher Level Designations

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 consists 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 object properties for "system attributes for operator control and monitoring".

Note

To ensure that designations are consistent throughout the entire project, during configuration use a suitable name for the hierarchy folder in the plant view.

Make sure that the number of characters in the hierarchy folder name does not exceed the number of characters specified for the HID. Names that have more characters than the specified number are only partially displayed in the HID.

Specific setting – "system attributes for operator control and monitoring"

In the "System attributes for operator control and monitoring" 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.

5.3.4.2 How to Specify Settings for the Higher Level Designation

Introduction

You have two options for setting 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 corresponds to the system.
2. Select the **Options > Plant Hierarchy > Settings** command.
3. Enter the number of hierarchy levels in your project in the input box marked "Number of hierarchy levels".
4. Enter a numerical value in the input box in the "Max. number of characters" column. This numerical value determines the maximum length of the name of the hierarchy folder. The more hierarchy levels you have in your project and the more levels you will to insert in the creation of the higher-level designation (HLD), the lower the maximum number of characters that you should choose. This will enable you to retain a clear overview of the work in the project.
5. In the column "HLD forming", enable the checkboxes which you wish to include in the HLD.
6. If you wish to keep the names of individual levels apart within the HLD, enable the required checkboxes in the column "With separators".
   See the principle structure of the HLD in the "Preview" box.
7. Click "OK".

Defining specific settings – "Control and monitoring attributes"

1. In the SIMATIC Manager plant view, select the hierarchy folder for which you wish to define a specific setting.
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 isn't part of the HLD, disable the "Name of the hierarchy folder is part of the HLD" checkbox.
   - If the hierarchy folder is to be part of the HLD, enable the "Name of the hierarchy folder is part of the HLD" checkbox.
5. Click "OK".
   Depending on which which setting you choose, the name of the hierarchy folder is removed from the HLD or added to it.

5.3.5 Defining the OS area identifier

5.3.5.1 OS Area Identifier

OS area identifier for OS areas

The OS areas are derived from the system structure you created in SIMATIC Manager. A system unit in SIMATIC Manager corresponds with 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 "Operator control and monitoring attributes" tab.
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 a large plant, operators are assigned different OS areas. This means that during process mode they can view and operate only those OS areas for which they have rights. Even when the message list is opened, messages are displayed for only those OS areas for which they are authorized. 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.

5.3.5.2 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 corresponds to the system.
2. Select the **Options > Plant Hierarchy > Settings** command.
3. In the "OS Area" column, click the radio 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 **Edit > Object Properties** command, and then select the "Control and Monitoring Attributes" tab.
3. Enter the new name in the "OS area identifier" box.
4. Click "OK".
   The OS area identifier applies to all lower-level objects in the hierarchy.

NOTICE
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.

5.3.6 Effect of Picture Hierarchy on the Picture Tree Manager

5.3.6.1 Relationship between Picture Hierarchy and Picture Tree Manager

Picture tree in the plant view

According to your plant configuration, you insert pictures in the plant hierarchy in order to display the process to the plant operator. You can insert one picture per hierarchy folder. Inserting pictures in the plant hierarchy results in a picture hierarchy that serves as an important aspect when managing process pictures. Once the OS is compiled, the Picture Tree Manager has the same hierarchy as the plant hierarchy.

Plant view and picture hierarchy in the Picture Tree Manager

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

NOTICE
The display of the hierarchy levels in the Picture Tree Manager starts at the hierarchy level that was defined as the OS area. The Picture Tree Manager shows only those hierarchy folders that actually contain a picture.

Control and monitoring attributes and picture names

During process mode, the plant operator sees the picture names in the picture hierarchy of the OS. You can assign separate picture names for individual hierarchy folders that are then transferred to the Picture Tree Manager when you compile the OS. The default setting for the picture names corresponds to the name of the hierarchy folder. You only have to make settings if you want to assign a name other than the default setting.

5.3.6.2 How to Define the Transfer of the Picture Hierarchy

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder that corresponds to the system.
2. Select the **Options > Plant Hierarchy > Settings** command.
3. Activate the "Derive picture hierarchy from the plant hierarchy" check box.
   This transfers the picture hierarchy from the plant hierarchy to the Picture Tree Manager when you compile the OS.
4. Click "OK".

NOTICE
If you have selected this option and then modify the picture hierarchy directly in the Picture Tree Manager, the changes are overwritten when the OS is recompiled.

5.3.6.3 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 to which you want to assign a special 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 **Edit > Object Properties** command.
3. Select the "System attributes for operator control and monitoring" 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" input box.
5. Click "OK".

NOTICE
If you manually assign a different name for the OS 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.

5.3.7 Updating the OS Area Identifier and Name for the OS

Updates in the OS

If you make changes to the following objects in the SIMATIC Manager (plant view or project object view), these changes are automatically applied in 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

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. • No operator inputs can be performed on the WebNavigator client due to missing operator authorization.

Settings for the consistency of the configuration data

You need to make the following settings to ensure the consistency of the configuration data:

- Settings in the plant hierarchy:
  Activate the "Derive picture hierarchy from the plant hierarchy" check box.

  For further information on this subject, refer to the chapter "How to Define the Adoption of the Picture Hierarchy (Page 62)".
- In the object properties of the hierarchy folder:
  The "No modification when renaming the hierarchy folder" check box is **deactivated** (default)

5.4 Additional Tasks for OS Configuration

5.4.1 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
- Enter multilingual unit and operator texts for faceplates
- Adapt 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.

Additional information is available in the *Process Control System PCS 7; Engineering System* manual.

5.4.2 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.

Select the **View > Process Object View** command in SIMATIC Manager to open the process object view. For the PCS 7 OS, the following tabs are required:

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

Additional information

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

5.4.3 Setting the AS-OS assignment

5.4.3.1 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 CFC and SFC charts which are 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 hierarchy are stored in the folder of the assigned OS.

5.4.3.2 How to Make the AS-OS Assignment

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder required for AS-OS assignment.
2. Select the **Edit > Object Properties** command.
3. Select the "AS-OS assignment" tab.
4. From the "Assigned AS" list, select the S7 program that you want to assign to the selected hierarchy folder.
5. If the lower-level objects have a different assignment and you want to have the same assignment for all lower-level objects, check the "Pass on selected assignment to all lower-level objects" checkbox.

   Note

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

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

   Note

   This assignment can only be performed for the hierarchy folder which 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 all the lower-level objects" checkbox is displayed. This checkbox is enabled as a default and cannot be disabled because all the lower-level OS-related objects in an OS area must have the same OS assignment.

7. Click "OK".
   The AS-OS assignment is performed, and the lower-level objects are passed on or not passed on depending on your setting.

5.4.3.3 Pictures in the Plant Hierarchy

Introduction

Pictures enable you to visualize the plants and the plant units, thus making it easier for plant operators to control and monitor the process from 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.

5.4.3.4 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 that is to have a picture inserted.
2. Select the **Insert > Technological Objects > Picture** command.
   - 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 perform the OS assignment straight away.
   - 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. Mark the picture in the detail view and select the menu command **Edit > Rename**.
4. Enter as short a unique name as possible and press Enter.
   The name of the picture is applied.

NOTICE
Make sure that the names of the pictures do not start with two underscore characters. If you wish to use a WebNavigator Client for process control and monitoring, the WebNavigator Client is unable to assign the pictures uniquely to the different OS servers.

5.4.4 Function and Creation of Block Icons

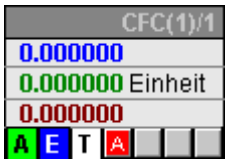
5.4.4.1 Function and Creation of Block Icons

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 controlled and monitored from CFC charts are displayed as block icons.

Example of a block icon

For example, you can view the process value (PV), setpoint (SP) and manipulated variable (OUT) for a closed-loop 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 dynamically updates the ready-made block icons in the selected process pictures. This function can be used to update block icons whenever you make changes to CFC charts, for instance.

Starting off with a block icon in a process picture, the plant operator can open the corresponding faceplate while the process is in operation; the faceplate provides him with access to wide-ranging, detailed information and facilitates block control.

There is further information available about this in the section "Correlation between Faceplates and Block Icons (Page 167)".

Multiple icons for a block

Some blocks require a number of versions of icon, for example a valve can have a block icon depicting it mounted in a vertical position, as well as one depicting it in a horizontal position. Use a parameter which is entered in the properties for the block instance to define which icon is created in your process picture. This parameter is the "type" attribute for the block icon.

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

- @@PCS7Typicals or @PCS7Typicals for blocks from the PCS 7 standard library
- @PCS7TypicalsAPL for blocks from 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 for this attribute, e.g. "2", as the parameter in the block instance.

There is further information available about this in the section "Block Icons and the File @@PCS7Typicals (Page 168)".

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 the SIMATIC Manager for process pictures, the "Create/Update Block Icons" function creates the block icons for these process pictures. There is further information available on this in the section "How to Create and Update Block Icons (Page 74)".

The plant hierarchy does not apply between different multiprojects. 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.

5.4.5 Creating block icons

5.4.5.1 Procedure for Creating Block Icons

Sequence

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 the CFC charts stored on the hierarchy levels that you specified when you called the function.

NOTICE
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.

- 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 are obtained from the blocks listed above and saved in a temporary file. These data are 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.

5.4.5.2 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 default setting is "Derive block icons from the plant hierarchy" 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 generated by PCS 7.
2. Select the **Edit > Object Properties** command.
3. Select the "Block icons" tab.
4. Select the "Derive block icons from the plant hierarchy" check box.
5. Click "OK".
6. Repeat steps 2 to 5 for all pictures where you want block icons to be created automatically.

Making settings in the process object view

1. Open the process object view in the SIMATIC Manager.
2. In the tree view, select the project folder or any hierarchy folder with the pictures for which you want make the setting for creating block icons.
3. Select the "General" tab.
4. Click in the "Type"column heading.
   All objects are sorted and all pictures are displayed in ascending order.
5. Go to the "Block icons" column.
6. Select the check box for each of the pictures for which you want to create block icons.
7. Close the process object view.

You can find information about how block icons are actually generated in the section "How to Create and Update Block Icons (Page 74)".

5.4.5.3 How to Specify the Type of Block Icon

Procedure

1. Open the plant view in the SIMATIC Manager.
2. Double-click the required CFC chart.
   The CFC chart opens.
3. Mark 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" 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:
   - @@PCS7Typicals.pdl for blocks from the PCS 7 standard library
   - @PCS7TypicalsAPL.pdl for blocks from the PCS 7 advanced process library

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

   Further information is available in the section "Block icons and the file @@ PCS 7 Typicals (Page 168)".

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.

5.4.5.4 How to Create and Update Block Icons

Introduction

You can generate the block icons as follows:

- By using 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 **Options > Plant Hierarchy > Create/Update Block Icons** command.
   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 "Included lower hierarchy levels" drop-down list select the number of lower hierarchy levels which should be taken into account in the creation of block icons.
5. 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 variables are created in the PCS 7 OS. Only then will the variable interconnections in the process pictures of the PCS 7 OS be corrected automatically when blocks or charts are changed or renamed.

5.4.6 Adapt the unit and operator texts

5.4.6.1 Unit and Operator Texts

Units and operator texts in faceplates

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

You can find detailed information about faceplates in the section "Using Faceplates (Page 166)".

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.

There is further information available on this in the section "How to Change Unit and Operator Texts in Foreign Languages".

Unit and operator texts in the block types

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

- "Unit" and "Identifier": These texts are used to denote analog connections.
- "Text 0" and "Text 1": These texts are used to denote statuses of binary connections.

5.4.6.2 Adapting Unit and Operator Texts

Adapting Unit and Operator Texts

If you want to adapt texts for unit and operator texts, proceed as follows:

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

The following actions require a different procedure:

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

Adapting the texts for a block type

If you want to adapt the texts for a block type, you only have to change the unit or operator texts once in the project library. Then, you can create block instances in CFC charts from the block types in the project library. You do not have to adapt each individual instance.

CAUTION
Be sure to create a separate project library. If you want to adapt block types, copy these block types into your project library. Always change the unit or operator texts for a block type at the start of configuration. If you have already created CFC charts in the project, change the unit and operator texts in the individual block instances.

Adapting texts for block instances

If you have already created block instances in your project, you have to edit these as an additional step. Block instances can be conveniently edited in the process object view.

5.4.6.3 How to Edit Texts for a Block Type

NOTICE
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	What?
1	Determining the connection requirements
2	Changing the unit and operator texts in the "LAD/FBD/STL" editor

Step 1 – Determining the connection requirements

Since the "LAD/FBD/STL" editor does not tell you which connections have been assigned unit and operator texts, the following preparations have to be done:

1. Open any view in SIMATIC Manager: component view, plant view or process object view.
2. Create a CFC chart.
   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 wish to change, into this CFC chart.
5. Mark the block in the CFC chart and select the menu command **Edit > Object Properties**.
6. Open the "Connections" tab.
7. Take note of all the connections which are entered in the columns "Identifier", "Text 0" and "Text 1".
   Then edit these connections 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 **Options > Language for Display Texts** command.
3. Select the desired display language as the default language and then click "OK".

CAUTION
N.B. Whenever you compile the OS again, always set the same "Language for Display Texts" that you had specified in step 3.

4. Open the project library and select the folder "[Name of the project library]/[Name of the S7 program]/Blocks".
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 a connection which you had noted 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.

5.4.6.4 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 the SIMATIC Manager.
2. Select the "Parameters" tab.
   The data are updated.
3. In the "Filter by column" list, select "Block type".
4. In the "Filter text" field enter the name of the block type, e.g. "meas_mon".
   The data are 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.

5.4.7 Defining archive tags

5.4.7.1 Archive tags

Specifying process values for archiving

You decide whether or not a process value is archived using an attribute of the block I/O. This is possible only if the block I/O can be controlled and monitored by the operator. 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 are not archived. This is the default setting.
Archiving	The data are 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 central archive server in your system. Initially, the data are archived locally on the OS server as defined by the "Archiving" setting. The data are archived on the central archive server and subsequently stored in a long-term archive. The data from the long-term archive can be swapped out to external data media, for example, an external server or DVD. If process values in process mode are displayed in a trend, 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 central archive server. This assumes you have configured and activated a central archive server.

You can find additional information about archiving and the archive server in the section "Archiving in PCS 7 (Page 231)".

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.
  Additional information on the process object view is available in the *Process Control System PCS 7; Engineering System* manual.
- In the CFC editor, block's object properties, "Connections" tab

5.4.7.2 How to Identify Tags for Archiving

Identifying tags in the process object view

1. Open the process object view in the SIMATIC Manager.
2. Select the folder to which you saved the required CFC charts from the tree view.
   The corresponding data are output to the detail view.
3. Select the "Parameters" tab.
   The data is updated.
4. Switch to the "Archive" column.
   All archive-related block connections are entered with the default value "No archiving".
   You cannot make any entries in the input boxes of all the other block connections.
5. Click the input box on the required block connection.
6. Select the desired archiving type from the drop-down list box
7. Perform this setting for all the connections that you wish to archive.

Identifying tags in the block's object properties

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

5.4.8 Configuring messages

5.4.8.1 Message Configuration

Introduction

Messages are important for the operator when controlling the process. 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 configuration as part 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.
You want to modify a message text for a block type in order to create instances,	Change the block type directly.

NOTICE
Create a separate 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.

5.4.8.2 How to Configure User-specific Messages

Procedure

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

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

5. If you wish to change the alarm texts from an individual block instance, proceed as follows:
   - In the tree view, select the hierarchy folder in which the required CFC chart is saved.
   - Double-click the CFC chart in the detail view.
   - Mark the block, whose message attributes or texts you wish to change, in this CFC chart.
     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 alarm texts from 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 alarm text in the "Event" column.
9. If the plant operator wishes to acknowledge a message, enable the message's checkbox in the "Single acknowledgement" column.

10. Save your entries.
    - If you have changed any of the block instances, click "Save".
    - If you have changed a block in any of the project libraries, click "OK".

Note

If you also wish to change the alarm 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.

5.4.9 Using 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 by the name 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:

Where?	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 commentary, and the title line displays the plants designation as a default entry.

5.4.10 Expanding the Event Text of a Message

5.4.10.1 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. This event text is prefixed with the keyword: "$$BlockComment$$". If this keyword is present, the entry is read out of the "Comments" box and displayed along with the event text in the message in process mode.

5.4.10.2 How to Supplement Block Comments

Procedure

1. Open the plant view in the SIMATIC Manager.
2. Double-click the CFC chart which contains the block instances you want to adapt.
   The CFC chart opens.
3. Mark 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 "Commentary" input box. 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 commentary.

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 commentary" column.

5.4.10.3 How to Delete the Supplementary Information of the Standard Event Text

Introduction

If you do not require additional information for the event text and also want to avoid displaying the default text, make this setting once for all block types.

NOTICE
Always store the block type in your project library before adapting it. Do not adapt block types if you have already created block instances.

Procedure

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

5.4.11 Specifying message priorities

5.4.11.1 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 these settings 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 separately 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 a "CPU-oriented unique" message number range.

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 *PCS 7 Process Control System, OS Process Control* manual.

5.4.11.2 How to Specify a Message Priority

Specifying the message priority for a block type

NOTICE
Create a separate project library at the start of configuration. Then specify the message priority in a block type at the start of configuration.

1. In SIMATIC Manager, open your project library.
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 **Special Object Properties > Message...**
   The "PCS7 Message Configuration - [name of project library]\[Name of S7 program]\[Name of the block folder]\[Name of the block]" dialog box 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. Mark the block, whose message priority you wish to change, in this CFC chart.
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 program saves the priorities for 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.

5.5 Compiling OS data

5.5.1 Compiling the OS

Introduction

You must compile the OS when you have finished configuring all of the data in SIMATIC Manager and are just about 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
You want to compile an individual OS	Select the OS in the SIMATIC Manager component view, and select the menu command **Compile** in the shortcut menu (right-click).
You want to compile multiple operator stations	Select the required project from the component view in SIMATIC Manager, and then select the **Options > 'Compile Multiple OSs' wizard > Start...** command.
You want to compile and download multiple operator stations	Select the multiproject or the project from the component view in SIMATIC Manager, and then select the **PLC > Compile and Download Objects** command. In the "Compile and Download Objects" dialog box, you can select the check boxes for the required operator stations, make the compilation settings and start the compile and download operation.

NOTICE
If you are working within a multiproject, make sure to merge all projects of the multiproject again before performing a complete compilation. Also ensure that the names of the S7 programs of the multiproject are unique in the multiproject.

5.5.2 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 permissions.
- Tags, messages and texts that arise or are configured when CFC charts are created.
  These objects must be compiled in order for you to access them during OS configuration.
- Archive tags that were selected as archive-relevant in the properties of the block I/O
- Structure types created through the use of certain block types in CFC charts
- SFC charts displayed for process mode.
  This enables the plant operator to monitor the process in the form of SFC charts in process mode.
- Structure for storing process pictures in the plant hierarchy, which is mapped onto WinCC in the form of the Picture Tree
- 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]

5.5.3 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.

5.5.4 How to set the compilation mode

Procedure

1. Select 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 **Options > 'Compile Multiple OSs' wizard > Compilation mode…** . command. The "Compilation mode" dialog box opens.
4. Enable the appropriate checkbox. The following options are available:
   - "Area-oriented": If you wish to assign the "OS area of the PH to an OS server" during OS compilation.
   - "AS-oriented": If you wish to assign the "one or more S7 programs to an OS server" during OS compilation.

NOTICE
A complete compilation is required after changing the compilation mode.

5. Click "OK".

5.5.5 How to Compile an Individual OS

Requirement

- The correct "Display language" is set.
  It is necessary to check the language if you have modified unit or operator texts that relate to block types in the project library.

Procedure

1. In SIMATIC Manager, open the component view.
2. Select the OS you wish to compile in the tree view.
3. Open the shortcut menu (right-click) and select the **Compile** command.
   The "Compile OS" wizard opens, which will take you through the compilation process step-by-step.
4. Perform the following steps, as described in the section "How to Compile Multiple Operator Stations (Page 95)".

5.5.6 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 that relate to block types in the project library.
- The PCS 7 project is opened in the SIMATIC Manager in one of the following views: component view, plant view or process object view.
- A PCS 7 project is marked in the tree view.
- Compilation mode is set. You can find further information about this in the chapter "How to Set Compilation Mode" (Page 94).

Procedure - AS-oriented compilation

1. Select the menu command **Options > Compile Multiple OSs' wizard' > Start...** .
   The wizard is opened; 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 wish to assign to which operator stations?" is displayed.
3. Mark 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 wish to compile with which S7 programs?" appears, and all the checkboxes are enabled as the default.
   If necessary, disable the checkboxes for the required OS or S7 programs which you do not wish to include in the compilation process.
6. Mark 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 is opened.
8. Select the required network connection.
9. Click "OK".
10. Click "Next".
    The step "Select the compilation data and scope of compilation" is displayed. In this step you specify which data is to be compiled.
    You can find further information about this in the Online Help for the "Wizard: Compiling Multiple OSs" dialog box.
    - If you wish to be able to display SFC charts in process mode, enable the "SFC visualization" checkbox.
    - From the drop down list box, select the "Minimum acquisition cycle of the archive tags:" drop down list box.
    - In addition, specify the scope of the compilation data: "Complete OS" or "Changes". You must always compile the complete OS during the first compilation. Following changes, you can enable the "Changes" checkbox.
11. Click "Next".
12. In the "Check the selected options" step, check the settings which 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 is opened; it will guide you step-by-step through the compilation process.
2. In the "Introduction" step, click "Next".
   The step "Which areas do you wish to assign to which operator stations?" is displayed.
3. Click a box in the "OS assignment" column.
4. From the drop down list box, select the OS which you wish to assign to the area which is named in the same line in the "Area" column.
5. Click "Next >".
   The step "Select the network connection for the S7 programs associated with the areas" is displayed.
6. Mark the S7 program for which you wish to define the network connection.
7. Click the "Connection" button.
   The "Select network connection" dialog box is opened.
8. Select the required network connection.
9. Click "OK".
   Follow this procedure for all the other S7 programs.
10. Click "Next".
    The step "Select the compilation data and scope of compilation" is displayed. In this step you specify which data is to be compiled.
    You can find further information about this in the online help for the "Wizard: Compiling Multiple OSs" dialog box.
    - If you wish to be able to display SFC charts in process mode, enable the "SFC visualization" checkbox.
    - Select the project-specific setting from the "Minimum acquisition cycle of the archive tags:" drop down list box.
    - In addition, specify the scope of the compilation data: "Complete OS" or "Changes". You must always compile the complete OS during the first compilation. Following changes, you can enable the "Changes" checkbox.
11. Click "Next".
12. In the "Check the selected options" step, check the settings which 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.

5.5.7 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 loading the reference OS.
- The correct "Display language" is set.
  It is necessary to check the language if you have modified unit or operator texts that relate to block types in the project library.
- Compilation mode is set.

Procedure

1. Open any view in the SIMATIC Manager: component view, plant view or process object view.
2. Mark a project in tree view.
3. Select the menu command **Target system > Compile and Download Objects...**.
   The "Compile and Download Objects" dialog box opens.
4. In the "Selection table" group select the OS which you wish 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 the section "How to Compile Multiple Operator Stations" (Page 95).
6. Click "Start".
7. Close the "Compile and Download Objects - Notepad" protocol.
8. Click "Close".

Further information

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

5.6 Managing multilingual texts

5.6.1 How to Manage Multilingual Texts

Introduction

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

Requirement

All languages are installed as required.
Further information is available in the section "Configuration and User Interface Languages (Page 33)".

Procedure

1. In SIMATIC Manager, open the component view.
2. Mark the project in 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 requisite changes to the CSV file.

Note

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

6. After inputting the changes, select the menu command **Options > Manage Multilingual Texts > Import...** and import the amended CSV file.
7. Compile the OS.
   There is further information available on this in the section "Compiling the OS Data".
8. Download the OS.
   There is further information available on this in the section "Downloading a Project and Configuration Changes".

Further information

- Online Help on the dialog boxes
- Manual *Process Control System PCS 7; Engineering System*

Configuring the OS Data in WinCC Explorer

6

6.1 Working with 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 **Edit > Open Object** from the menu.

Note concerning the plant structure

CAUTION
In WinCC, avoid any modifications that will affect the plant structure you have created in SIMATIC Manager. SIMATIC Manager is the only program that can be used to create and update the plant structure. Otherwise, there is a risk of overwriting or failing to update when compiling the OS data.

6.2 Editors in WinCC Explorer

Introduction

Various editors are available in WinCC Explorer on 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 the WinCC Explorer in the PCS 7 environment

The WinCC Explorer offers you a variety of editors, some of which can be used intensively 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 which 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 controllable and observable PCS 7 block. You can insert and dynamically update other 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 which is used to archive measured values. The parameters for the system archive can be changed in Tag Logging. You can create new archives individually and assign the process values, which you wish to archive, to these archives. In so doing, you can define a process of archiving which is tailored precisely to your needs. The archived values can also be displayed in process mode.
Picture Tree Manager	In the Picture Tree Manager editor, you can calculate or update the hierarchy of the group displays.

Editor	Description
User Administrator	In the User Administrator editor, you can define the higher-level user groups and individual users for whom you can define certain rights. These rights are defined for the OS areas which were specified by you in the Plant Hierarchy in the SIMATIC Manager.
Block List editor	In the Block List editor you can view all the blocks which you inserted into CFC charts in the 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 picture block is automatically called in the "loop-in-alarm" function.

Additional help in the WinCC Explorer

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

6.3 Properties of OS

6.3.1 Overview of the OS Properties

Introduction

Specific properties must be set for each individual OS.

Setting	Meaning
Project properties (Page 104)	The project property settings apply to the entire OS.
Computer properties (Page 108)	The computer property settings apply to the OS you have opened via SIMATIC Manager.

6.3.2 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	Use this setting 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 establish whether a WinCC project in the WinCC ServiceMode is to be operated as a service. WinCC Runtime can also be enabled in ServiceMode if no interactive user has been logged in to the computer.
Hotkeys (key combinations)	You can define hotkeys for the following functions: • Log on • Log off • Hard copy These functions are used by plant operators in process mode.

Tab	Settings / meaning
User interface and design	You can define the appearance of the user interface in process mode. We recommend that you install Design WinCC 3D or WinCC Classic. 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 self-generated objects and adapt these if necessary.
Options	You can unlock a project on the ES for enabling in Runtime. You establish whether the online help can be called up in Runtime.

Further information

- Online help for *WinCC Information System*.

6.3.3 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".

Further information

- Online Help for *WinCC Information System*

6.3.4 How to define hot keys

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 "Hot Keys" tab.
4. Select an action from the "Actions" list.
5. In the "Already Assigned" input field, enter the keyboard shortcut you want to use to perform this action in process mode.
   This new keyboard shortcut is displayed.
6. Click "Assign".
   The keyboard shortcut is applied.
7. Click "OK".

Additional information

- Online Help for *WinCC Information System*

6.3.5 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. If you want to make changes to the "main color palette", click "Edit".
5. If you want to change the "active design", click "Edit".
   All available designs are provided for selection in the "Designs" group. The preview shows how selected objects will appear.
   You have the option of creating independent designs.
   For further information, refer to chapter "Creating the project properties (Page 104)".
6. Click "OK".

Additional information

- Online Help for *WinCC Information System*

6.3.6 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.

For additional information, refer to the Online Help for the *WinCC Information System*.

Language setting and keyboard shortcuts – "Parameters" tab

The "Parameters" tab allows you to disable certain common Windows hotkeys. This prevents the operator in process mode from starting additional software applications that could adversely affect the performance of the OS. On this tab you enter various settings for the engineering phase and for actual operation:

If...	… then
you are still in the engineering phase,	do not enter any settings in this tab.
the project is going into actual operation,	disable all Windows hotkeys that the operator may not use. Only enter this setting once the engineering phase has been completed.

For additional information, refer to the Online Help for the *WinCC Information System*.

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

On the "Graphics-Runtime" tab you can define all settings for display in process mode. Usually, you do not have to edit these tab settings.

You can enter further display settings in the OS Project Editor.

When operating in test mode, you can activate the "maximize" and "minimize" window attributes, for example. This allows you to quickly change from the runtime view to other applications when running the system in test mode.

NOTICE
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 buffer for process pictures
- Appearance of the mouse pointer during certain actions of the operator

6.3.7 How to Work in the "Computer Properties" Dialog Box

Procedure

1. Select the "Computer" object in WinCC Explorer, and the select the command **Edit > Properties** command.
   The "Properties Computer List" dialog box opens. In the PCS 7 environment you are shown exactly the computer that you selected in the SIMATIC Manager and from which you opened the WinCC Explorer.
2. Mark 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 for *WinCC Information System*

6.4 Working with the OS project editor

6.4.1 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 monitoring and controlling 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 context 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 (loss of support for online DeltaLoading)" check box or the "Message configuration only" check box is activated in the "General" tab. You can establish 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 the SIMATIC Manager. For further information, refer to the chapter "Message priorities (Page 89)".

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 operating messages Assignment of messages without defined area allocation: 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 for the active process. You have to program these settings separately on 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 response as known in PCS 7 V6.1 SP1). – Selecting pictures of protected areas by means of 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 control is not possible in PCS 7 faceplates. Operator input in the process pictures depend on configured user authorization levels. – Selecting pictures of protected areas by means of 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 control is not possible in PCS 7 faceplates. Operator input in the process pictures depend on configured user authorization levels. For additional information, refer to the *WinCC Information System* Online Help.
Runtime window	• Definition of the maximum number of windows which can be opened when calling faceplates and trend displays. • Definition of the maximum number of faceplates which 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
General information	• OS Project Editor settings 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 documentation of the current project configuration • Execute the export/import of the current configuration settings in OS Project Editor as a convenient way of integrating other Operator Stations in the project

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.

The default settings which were automatically activated in the course of ES engineering configuration are displayed when you initially open the OS Project Editor. 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

6.4.2 How to Activate or Deactivate Individual Process Control Messages and Operating Messages of the OS

Introduction

The default process control messages and operating messages for the OS are available in the OS Project Editor for use within the context of 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" check box.

   Note

   Do not activate the "Complete configuration" check box.

5. Select the "Message configuration" tab.
6. Activate or deactivate the check boxes of the required messages.
7. Click "OK".

Additional information

- Online Help for *WinCC Information System*

Setting user rights

7

7.1 Overview of User Permissions

User permissions in process mode

User permissions are important in process mode. You also assign user rights to specific operators for using specific functions in process mode. User rights for message acknowledgment and process control input are not granted to all operators, for example.

NOTICE
To ensure that 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 the section "How to Make Alarm System Settings in the OS Project Editor (Page 211)".

Operators logging on in process mode by entering their logon name and password in order to monitor and control the process are authenticated and granted access only to the corresponding plant areas and functions.

"User Administrator" Editor

User rights are administered in the "User Administrator" Editor of WinCC Explorer. Use this editor to define the users, the user groups and the necessary permissions.

Additional information relating to the "User Administrator" Editor and user rights is available in the *WinCC Information System* Online Help.

Defining the reaction to missing user rights

Rules for picture selection in OS areas by users who do not have the necessary permissions are defined in the OS Project Editor.

Additional information is available in the section "Overview of OS Project Editor (Page 110)" and in the *WinCC Information System* Online Help.

User permissions for Web applications

If you are using a WebNavigator Client that allows plant operators access to control and monitoring functions on the Internet or Intranet, you must set up the respective user rights and settings for the web access.

Detailed information on use of Web Clients and OS Web Servers is available in the *Process Control System PCS 7; OS Web Option* manual.

7.2 User Permissions per OS Area

Plant hierarchy and user permissions

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. You also use this plant hierarchy to define the OS areas that are to have specific user permissions assigned, 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 Picture Tree Manager and the OS areas which are available in the User Administrator: The second hierarchy level in Picture Tree Manager is made available in the User Administrator as OS areas for which you can set user rights.

NOTICE
Avoid making subsequent modifications in the Picture Tree Manager. Subsequent modifications result in differences between the 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 if the OS is recompiled.

7.3 Setting user rights

7.3.1 User Groups and User Permissions

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

Color	Meaning
white	not authorized
red	Authorization for the corresponding OS area
brown / gray	Authorization is automatically issued by "enabling" the higher-level authorization setting.

The "enable" column is a higher-level setting for all the OS areas. If you enable the checkbox for one of the functions in this column by double-clicking it, all the other OS areas are automatically enabled.

User group

You can create different user groups and assign certain user rights 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 rights, 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. Only 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, simply apply the settings for that person's 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
  To create user groups/users and assign rights
- SIMATIC logon,
  Enabling the "SIMATIC Logon" checkbox:
  To create user groups and assign rights

For further information, refer to the Online Help:

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

7.3.2 How to Set User Permissions

The basic procedure for setting user permissions is presented below. Additional information is available in the *WinCC Information System* Online Help.

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" editor opens.
3. Check whether all plants/units from the Plant Hierarchy are available to you for setting of user rights.
4. Create user groups.
   For additional information, refer to the *WinCC Information System* Online Help.
5. Select the required user group in the navigation window.
6. Double-click the box of the OS area and of the function for which you want to assign a user right.
   The field is marked red.
7. Set the parameters for automatic logout and "login by smart card only".
8. Create users within a user group:
   - Define the login and password.
   - Activate the "Copy group settings" check box.
9. If necessary, define settings that are only applicable to this user.
10. Close the "User Administrator" editor.

Additional information

Additional information relating to settings in the "User Administrator" editor is available in the *WinCC Information System* Online Help.

7.4 Special user rights in editors

7.4.1 User Permissions in the Different 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 Alarm Control or WinCC Online Trend Control.

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 permissions for read and write access to this archive.

For further information, refer to the chapter "Additional archives in the "Tag Logging" editor (Page 241)".

Graphics Designer

User rights have the following effect in the Graphics Designer:

- User objects: The attribute "Authorization" is defined in the object properties.
- Alarm Control: A toolbar with a range of buttons appears in the Alarm Control 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.
- Online Trend Control: Online Trend Control gives the operator a variety of options for controlling operations. You can define authorizations in the object properties.
- etc.

7.5 Using a Chip Card

7.5.1 Smart card

Introduction

The chip card for user permission expands the functionality of the User Administrator.

Function of a chip card in process mode

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

With a logon name and corresponding password, the functionality of the chip-card reader can be used together with the logon function in an operator station.

Using chip cards

- You can use the chip card in conjunction with the WinCC User Administrator (Page 122) (without SIMATIC Logon).
- You can use the chip card in conjunction with the SIMATIC Logon (Page 123) service.

Additional information

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

7.5.2 How to write a chip card with the WinCC User Administrator (without SIMATIC Logon)

Introduction

The following shows you the principle procedure for writing a chip card with the WinCC User Administrator.

Requirements

- Read- and write-capable chip card readers
  - The chip-card reader is connected to a serial interface (e.g. COM1). We recommend that you use a chip-card reader with the operating system TCOS 2.0
    or
  - The chip-card reader is connected to a USB interface (as of WinCC V7.0 SP1 / PCS 7 V7.1).
- You will find information on the type of chip-card reader in the manual titled *Process Control System PCS 7; PC Configuration and Authorization.*
- The "chip card" option is installed (WinCC options).
- The chip card reader interface has been configured.
  - In the control panel of the operating system, double click on "WinCC Chip card Terminal".
    You will need Windows administrator rights for the configuration dialog.
  - In the "WinCC Chip card Terminal Configuration" dialog box, enable the "Terminal active" checkbox.
  - From the "Connection" drop down list box, select the required interface and then click "OK". Your settings are applied.
- There is a chip card in the chip-card reader.

Procedure

1. Select **Start > Settings > Control Panel > WinCC Chip Card Terminal** in Windows.
   This activates the chip card function.
   The corresponding menu command is enabled in the WinCC "User Administrator" editor.
2. Open the WinCC "User Administrator" editor.
3. Select the **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 chip card.

Additional information

- Online Help for *WinCC Information System*

7.5.3 How to write a chip card with SIMATIC Logon

Introduction

The following shows you the principle procedure for writing a chip card with the SIMATIC Logon service.

Requirements

- A read and write-capable chip-card reader is connected.
  - The chip-card reader is connected to a serial interface (e.g. COM1). We recommend that you use a chip-card reader with the operating system TCOS 2.0
    or
  - The chip-card reader is connected to a USB interface.
- You will find information on the type of chip-card reader in the manual titled *Process Control System PCS 7; PC Configuration and Authorization*
- The SIMATIC Logon service is installed.
- The interface of the chip-card reader has been configured in the SIMATIC Logon.
  - Select the menu command **Start > SIMATIC > SIMATIC Logon > Configure SIMATIC Logon**.
    The "Configure SIMATIC Logon" dialog box opens.
  - Configure the chip-card reader in the "Logon device" tab.
- The user name and password are setup on the various PCs (Logon stations) or in a central Windows domain.
- There is a chip card in the chip-card reader.

Procedure

1. Select the **Start > SIMATIC > SIMATIC Logon > Edit Chip Card** command in Windows.
   The "SIMATIC Logon Service - Edit Chip Card" dialog box opens.
2. Go to the "Logon to:" drop down list box and select and select:
   - Logon station (for workgroups, for example)
   - Domain
3. Go to the "Enter user name:" input field to enter the user.
4. Go to the "Password:" input field to enter the password
5. Go to the "Confirm password:" input field to enter the password again.
6. Click "Write data to Chip Card".
   The "SIMATIC Logon Service – Chip-card Reader" dialog box opens.
7. Click "OK".

Additional information

- Online help of *SIMATIC Logon*

Creating Process Images - Basics

8

8.1 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 control and monitor the process.

Plant operators can see the exact status of the plant using the process pictures, 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 using the process pictures.

Requirements for configuration of process pictures

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

- The process pictures must have been inserted in the plant hierarchy.
- The AS-OS assignment must have been completed.
- If necessary: The block icons have been created.
- The OS is compiled.

NOTICE
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. This includes such pictures as those required for configuring the status displays. Make sure that the length of a picture name does not exceed 24 characters.

8.2 Graphics Designer Overview

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
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 permissions for these pictures.

Additional information

For additional information, refer to the Online Help for the *WinCC Information System*.

8.3 Different 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 of working with drawing software, you will know how to work with these objects. For additional information, refer to the Online Help for the *WinCC Information System*.
Dynamic object	A dynamic object is updated via a connection to a tag or via certain functions. This means that the process values shown are always up-to-date in runtime. Input/output fields or status displays are examples of dynamic standard objects.

8.4 Types of Dynamic Updating

Dynamism options

There are several options for dynamic updating of objects inserted in a process picture:

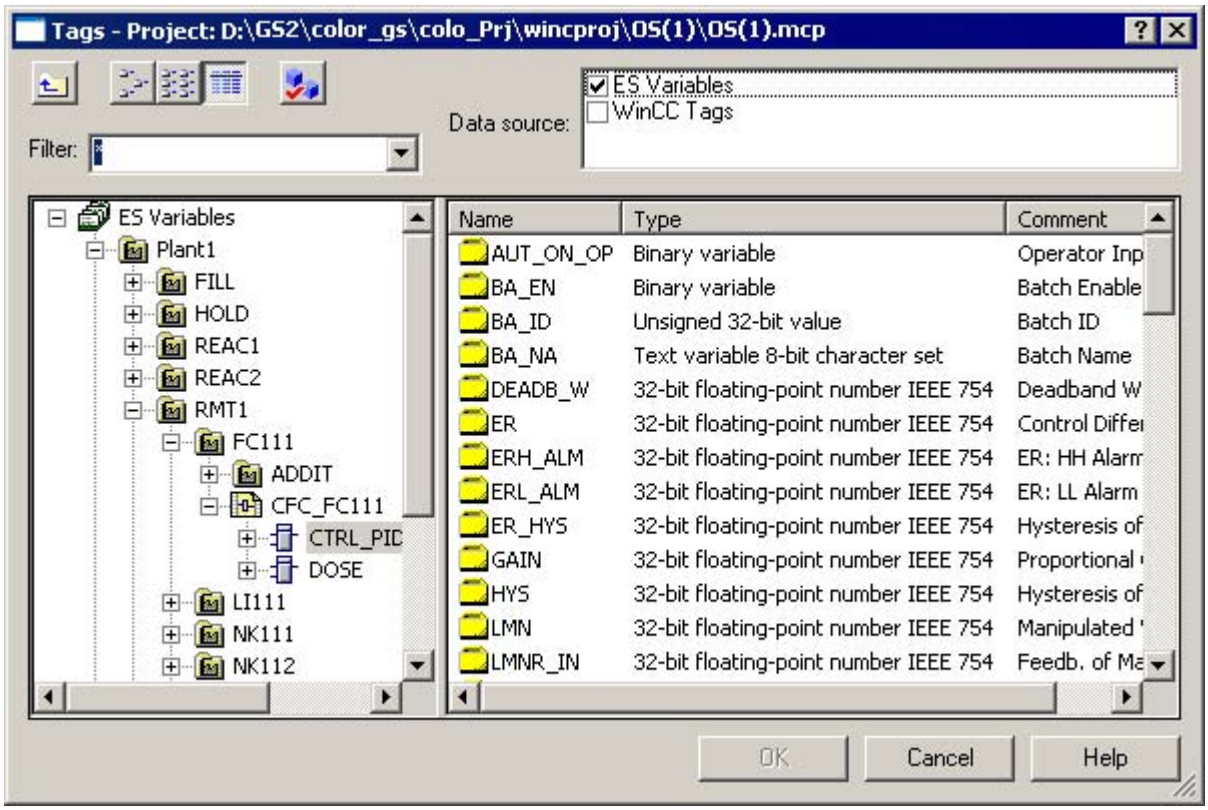
Option	Description
Tag connection	Tag interconnections are the simplest way of creating dynamic objects: Simply interconnect objects, for example, with the I/O of a block instance of a CFC chart. The current value of this connection is always shown in process mode.
Dynamic dialog box	You can formulate the dynamic updates using tags, functions and arithmetic operations in an expression. You can define specific value ranges. You can find further information about this topic in the *WinCC Information System* Online Help under "Dynamic Updating of an Action".
Direct link	A link is established between objects. Parameters only have to be assigned for the source object; then 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 which is programmed in ANSI C. This function is activated 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 (CPU-wide) validity. There is further information available on C actions in the *WinCC Information System* Online Help.
VBS action	A VBS action is created by linking an event, such as a change in a binary tag, to a function which is programmed in Visual Basic. This function is activated 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 (CPU-wide) validity. There is further information available on VBS actions in the *WinCC Information System* Online Help.

NOTICE
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 times in runtime. Move cyclic computing tasks into the AS and don't execute them on the OS.

8.5 Tag Connection and Tag Selection Dialog Box

Tag selection dialog box

Use the tag selection dialog when interconnecting an object with a tag in Graphics Designer. The tag selection dialog is a convenient way of creating dynamic functions for objects from Graphics Designer. 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.

Displaying the tag set-up

The tag selection dialog allows you to link objects, e.g. input/output fields or faceplates that you inserted in a process picture in the Graphics Designer, with the corresponding connection of a block instance in the CFC chart. In process mode these objects read the current values of the connection 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 the 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 the SIMATIC Manager. All other folders are hidden. If you connect an object with an ES tag, this tag is automatically included in the WinCC tag set-up, 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 set-up is managed 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

In the "Filter:" input box you can enter a search condition for the tag name. When you quit the input box by pressing the Tab key, you are only shown the tags that match the search criterion.

Further information about the tag selection dialog box is available in the *WinCC Information System* Online Help, which you can open by clicking "Help".

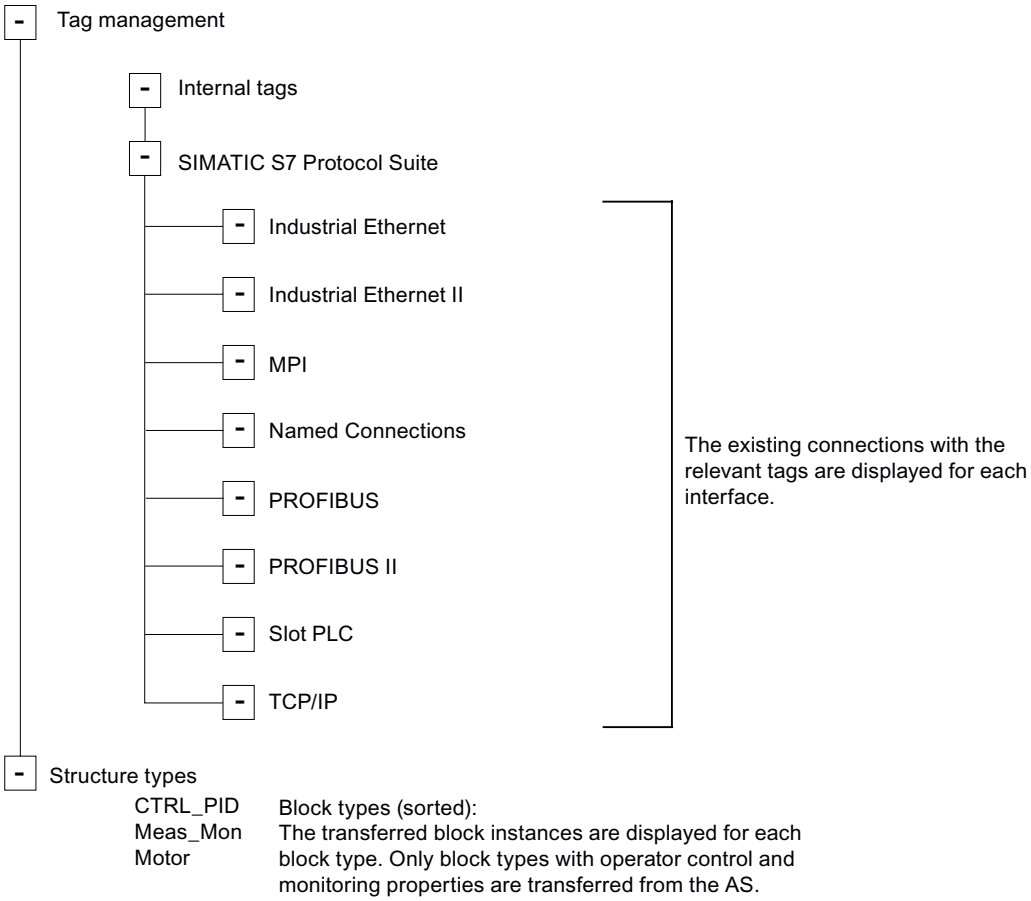
8.6 Configuring and Storing Tags in WinCC

Displaying tag management

Tags can also be seen directly using WinCC Explorer by selecting "Tag management" in the tree view. All channels, logical connections, process tags, internal tags and tag groups of WinCC are organized in the tag management. Tags from SIMATIC Manager are stored in the WinCC tag management.

PCS 7 and tags in WinCC

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



8.7 Tag name

Length of tag names

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]::[HLD]

- Assign the server prefix in the SIMATIC Manager ("PC station properties > Computer name").
- The HLD (Page 55) comprises the name of the folder in the hierarchy path, the chart name and the block name. Include the separators within the HLD.
  For instance, SERVER01::SUBSYSTEM1/MOTOR1

  Note

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

Further information

There is further information available on the length of the tag name in the *Process Control System PCS 7; Engineering System* manual, under "Rules for Naming in the PH".

8.8 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 the status display to display any number of binary states for an object, such as the states of a valve: "open" or "closed".
Bar graph	A bar graph display can be used to show values in relation to one another, for example, how the current value relates to an upper and lower tolerance.
Control	A control can be used to show the curve characteristic of certain 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 "Smart Objects" section of the *WinCC Information System* Online Help.

8.9 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, used-created objects

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

Object	Function
Faceplate (Page 166)	A faceplate is a dynamized object which represents a certain block type. By connecting to a structure tag, all the tags contained in a faceplate are automatically connected to the corresponding block parameters and updated dynamically.
Block icons (Page 167)	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, giving 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 176)	Create a user object by compiling individual objects. The advantage of a user object is that you can select which of the many properties, that each object "brings", you actually need to connect to tags.
User object templates (Page 186)	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.

8.10 Configuring dynamic objects

8.10.1 Overview of Configuration Tasks for Dynamic Objects

Overview of the Steps in Configuration

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

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

Step	What?
1	Open the process picture in the Graphics Designer (Page 135)
2	Inserting the dynamic object (Page 136)
3	Configuring the dynamic object (Page 137)
4	Defining the object properties (Page 136)

Further information

- Online Help for *WinCC Information System*

8.10.2 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 **Edit > Open Object** command. This opens WinCC Explorer; the required picture is opened in Graphics Designer in the next step.
Locate WinCC Explorer...	1. Select the "Graphics Designer" object in the tree view. All the existing pictures are displayed in the detail window. 2. Double-click the required picture in the detail view. The required picture is opened in the Graphics Designer.

8.10.3 How to Insert a Dynamic Object

Procedure

1. Open a picture in the Graphics Designer.
2. If the "Object palette" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Select the "Objects" check box.
4. Click "OK".
   The object palette opens.
5. Select the required object in the tree view for the "Smart Objects" object palette.
6. Click the drawing object.
   The mouse pointer is transformed according to the object selected.
7. Holding the mouse button down, drag a rectangle corresponding to the size you want your object to be.

8.10.4 How to Specify the Object Properties

Procedure

1. Open the process picture in the Graphics Designer and select the object on the workspace.
2. Select the **View > Properties** command.
   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.

8.10.5 How to Configure a Dynamic Object

Introduction

When you insert a dynamic object, the configuration dialog box automatically opens. You can open the configuration dialog box again and change the configuration settings at any time.

Setting parameters in the configuration dialog box

The dialog box that opens depends on the type of dynamic object you have inserted in step 2. Set the required parameters in this dialog box:

If ...	... then ...
You have inserted an application window	The "Window Contents" dialog box opens. Select what is to be displayed in the application window.
Picture window	No additional dialog box is opened.
Control	The "Insert Control" dialog box opens. Select the required control in the selection list.
You have inserted an OLE object	The "Insert Object" dialog box of Windows opens. There are two options: • Select the application you want to use to create the OLE object. • Select an existing file.
You have inserted an input/output field	The "I/O Field Configuration" dialog box opens. Click the button next to the "Tag" box and select a tag from the tag selection dialog box. In addition, specify the update cycle, the field type and formatting parameters.
Bar graph	The "Bar Graph Configuration" dialog box opens. Click the button next to the "Tag" box and select a tag from the tag selection dialog box. In addition, specify the update cycle, limits and formatting parameters.
You have inserted a 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" box and select a tag from the tag selection dialog box. Select a picture and also select the update cycle from the drop-down list box.
You have inserted a text list	The "Text List Configuration" dialog box opens. Click the button next to the "Tag" box and select a tag from the tag selection dialog box. Select the update cycle, the field type and formatting parameters from the drop-down list box.
3D bar graph	No additional dialog box is opened. Set the following values in the "Properties" dialog box in an additional step: • Maximum value • Minimum value • Process input/output

If …	… then ...
Group display	You can find additional information about inserting and configuring a group display in the section "Overview of the Group Display (Page 150)".
Extended status display	You can additional information about inserting and configuring an extended status display in the section "Overview of the Extended Status Display (Page 141)".

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

Reopening the configuration dialog box

If you want to change the configuration settings at a later point in time, reopen the configuration dialog box.

Proceed as follows:

1. Open the process picture in the Graphics Designer.
2. Select **Configuration dialog…** from the shortcut menu of the object to be configured. The configuration dialog box opens.
3. Change the configuration settings.
4. Click "OK".

8.11 Configuring a status display

8.11.1 Configuring a status display

8.11.1.1 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 states but practically any number of different states.

The object status display is created by linking 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 properties adopted by a status display in process mode are defined in the Graphics Designer.

8.11.1.2 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.

Configuring a status display with standard pictures

The following is an overview of the configuration tasks.

Step	What?
1	Dragging the "status display" object from the object palette onto the workspace
2	In the "Configuration" dialog box: interconnect the status display with the corresponding tag
3	Dragging the standard pictures to the respective states.

Configuring the status display with custom pictures

The following is an overview of the configuration tasks.

Step	What?
1	Creating the pictures for representing each state and exporting them as an EMF file
2	Dragging the "status display" object from the object palette onto the workspace
3	In the "Configuration" dialog box: interconnect the status display with the corresponding tag, and the states with the corresponding pictures

8.11.2 Configuring an extended status display

8.11.2.1 Overview of the Extended Display

Extended status display

By comparison to the standard status display, the extended status display offers several advantage: It simultaneously returns the alarm and operating states so that the plant operator can quickly see the alarms, warnings and errors in addition to the operating status.

Setting the parameters

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: Horizontal and vertical view of a valve.

The steps are presented below using the horizontal/vertical valve representation as an example:

Step	What?
1	Configure the status display for the horizontal valve representation: • Define all operating and alarm states. • Assign associated bitmaps.
2	Export the configuration to an XML file.
3	Execute the "Find/Replace" function: Replace all instances of the bitmap name showing the valve in horizontal position with the bitmap name showing the valve in vertical position.
4	Save the XML file with a descriptive name.
5	Import the settings from the modified XML file for the vertical valve representation.

8.11.2.2 Working with the Extended Status Display

Operating and alarm states

You can display a maximum of four different binary signals representing 16 different operating statuses in the extended status display. The four signals are bit-coded in the 32-bit tag of "VSTATUS" of the block type.

You can logically combine the operating states and alarm states. You must define different priorities for these 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

All settings are defined in a configuration dialog box. A number of combinations are possible depending on the binary statuses and alarm statuses selected. You can then assign the required bitmap, which is displayed in the process picture in process mode, to each combination.

Information in the 'block type' Online Help

The Online Help for each block type contains the following information, which you require in order to configure the extended status display:

- The assignment of an operating status to a specific bit within the "VSTATUS" tag: All the binary statuses which can be displayed in the extended status display are saved in this particular "VSTATUS" tag.
- The alarm statuses which this block type can adopt as standard.

Overview of the configuration steps

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

Step	Content
1	Determine the bit number from VSTATUS (Page 143)
2	Make preparations for the extended status display (Page 144)
3	Insert the extended status display (Page 145)
4	Configure the extended status display (Page 145)
5	Link the tags (Page 146)

8.11.2.3 How to Determine the Bit Number from VSTATUS

Introduction

When configuring the extended status display, you need the bit number of the block I/O you want to display. The bit number is stored in the "VSTATUS" tag. The information can be found in the online help for the block.

Procedure

1. Open a CFC chart in SIMATIC Manager.
2. Select the block for which you want to insert an extended status display.
3. Press <F1>.
   The online help for the block opens.

Result

The configuration of the VSTATUS 32-bit status word can be found in the "VSTATUS for [block name]" section of the Online Help.

8.11.2.4 How to Prepare the Extended Status Display

Introduction

The task of determining the states is described using the "Valve" block as an example.

Procedure

1. Specify the I/Os that are to be shown in the status display. In this example, the following I/Os are specified::
   - QOPEN
   - QCLOSE
   - QOPENING
   - QCLOSING
2. Create a table where you enter all possible states.
3. Determine the relevant index on the basis of the states and assign the pictures.

Result

The valve table is then as shown below.
Based on this table, configure the extended status display in the index list at the corresponding "Properties of the extended status display" dialog box, "Assign picture" tab. Further information is available in the *WinCC Information System* Online Help.

Bit 0 QOPEN 2 high 0=1	Bit 1 QCLOSE 2 high 1=2	Bit 2 QOPENING 2 high 2=4	Bit 3 QCLOSING 2 high 3=8	Index	Basic picture	Flashing picture
0	0	0	0	0	undefined	–
1	0	0	0	1	@VVE_opened	–
0	1	0	0	2	@VVE_closed	–
1	1	0	0	3	@VVE_error	–
0	0	1	0	4	@VVE_closed	@VVE_opened
1	0	1	0	5	@VVE_error	–
0	1	1	0	6	@VVE_error	–
1	1	1	0	7	@VVE_error	–
0	0	0	1	8	@VVE_opened	@VVE_closed
1	0	0	1	9	@VVE_error	–
0	1	0	1	10	@VVE_error	–
1	1	0	1	11	@VVE_error	–
0	0	1	1	12	@VVE_error	–
1	0	1	1	13	@VVE_error	–
0	1	1	1	14	@VVE_error	–
1	1	1	1	15	@VVE_error	–

8.11.2.5 How to Insert an Extended Status Display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Object palette" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Select the "Objects" check box.
   The object palette opens.
4. In the object palette, select the "Status display (extended)" object under "Smart objects".
5. Move the mouse pointer to the drawing area.
   The mouse pointer is transformed into a status cursor.
6. Hold down the mouse button and draw a rectangle of the size of the extended status display.
   The "Properties of the extended status display" opens..

8.11.2.6 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 wish to make later changes to the configuration, open the shortcut menu for the selected status display and select the **Configuration dialog box...** command.
     The "Properties of the extended status display" dialog box opens.
2. In the "Bit selection for status value processing" group, select the desired status words from the drop down list box.
3. Enter the status word bit to be used in the relevant "Bit no." input box.
4. In the "Evaluation of group value" group activate the "Use group value for display" check box if you want to display an alarm evaluation in the representation of the status display. In the "Used bits" list, show the bits that you use for representation of the alarm evaluation.
5. Select the "Assign pictures" tab.
   All the combinations that are theoretically possible are shown in the list, depending on your settings in the "General" tab.
6. Select the combination from the list which you wish to visualize in process mode.
7. Double-click the required picture in the list of pictures.
   The picture is assigned to the combination and appears in the "Basic picture" column.
8. If you also wish to define a flashing picture, double-click the required picture in the list.
   The picture is assigned to the combination as a flashing picture and appears in the "Flashing picture" column.
9. Repeat steps 5 through 8 for all the combinations for which you wish to specify pictures.
10. Click "OK".

8.11.2.7 How to Make the Tag Connection

Procedure

1. Select **Properties** from the shortcut menu of the extended status display.
   The "Object properties" dialog box opens.
2. Define the following settings for the "Others" property:
   - For the purposes of the "collective value" attribute, configure the link to the "EventState" tag for the required block instance.
   - For the purposes of the "status" attribute, configure the link to the "VSTATUS" tag for the required block instance.

   Note

   Select the "WinCC tags" data source for the "EventState" tag in the tag selection dialog box.
3. Click the title bar and select the command **Close** in the shortcut menu.

8.12 Configuring an Extended Analog Display

8.12.1 Working with the Extended Analog Display

What is shown 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 status of this input/output.

Overview of the Steps in Configuration

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

Step	Content
1	Inserting the extended analog display (Page 147)
2	Configuring the extended analog display (Page 148)
3	Connecting the tags (Page 148)

8.12.2 How to Insert an Extended Analog Display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Object palette" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Activate the "Objects" check box.
   The object pallet opens.
4. In the object palette, select the "Analog display (extended)" object under "Smart objects".
5. Move the mouse pointer to the drawing area.
   The mouse pointer becomes a small status display cursor.
6. Hold down the mouse button and draw a rectangle of the size of the extended analog display.
   The "Properties of the extended analog display" configuration dialog opens.

8.12.3 How to Configure an Extended Analog Display

Procedure

1. Open the "Properties of the extended analog display" configuration dialog box.
   - If you have just inserted the extended analog display, the configuration dialog box will already be open.
   - If you wish to make later changes to the configuration, open the shortcut menu and select the **Configuration dialog box...** command.
     The "Properties of the extended analog display" dialog box opens.
2. Assign the required colors to the different alarm statuses.
3. Click "OK".

8.12.4 How to Make the Tag Connection for the Extended Analog Display

Procedure

1. Select **Properties** from the shortcut menu of the extended status display.
   The "Object properties" dialog box opens.
2. Define the following settings for the "Others" property:
   - For the purposes of the "Group Value" attribute, configure the link to the "Event State" tag for the required block instance.
   - For the purposes of the "Value" attribute, configure the link to the tag which represents the corresponding analog value.
3. Click the title bar and select the command **Close** in the shortcut menu.

8.13 Configuring an input/output box

8.13.1 Working with Input/Output Fields

Introduction

You can use input/output fields to input or output values. Input/output fields can handle different data formats, such as binary, decimal, string, and hexadecimal.

Types of input/output fields

The "IO Field" object can be set in any of the following ways:

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

8.13.2 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 tasks.
You can find a detailed description of the configuration tasks in *Process Control System PCS 7; Getting Started - Part 1*.

Overview of the configuration steps

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

Step	What?
1	Drag the "I/O field" object from the object palette to the drawing area.
2	In the "Configuration" dialog box, Interconnect the relevant tag
3	Specify the relevant field type
4	If necessary, enter a static text as further clarification of the input/output field.

8.14 Configuring group displays

8.14.1 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 picture blocks.

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 pictures that belong to this area. The group displays in the overview area are always displayed.

The group displays in the overview area are always displayed as standard. This does not require configuration.

Updating group displays

Group displays are updated:

- When the project is downloaded.
- When saving the data in the WinCC Editor "Picture Tree Manager" and the "Recalculate entire group display hierarchy when saving" check box is set.
  Use this update when simulating process mode in SIMATIC Manager on the engineering station.
- When starting the Project Editor with the "Create/update group displays" check box activated

Options for the dynamic updating of a group display

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

- Connection between the group display and a measuring point (Page 158)
  Connect the group display to a measuring point so that the plant operator receives messages from the assigned measuring point in process mode.
- Connection between the group display and a picture (Page 160)
  Connect the group display to a picture so that messages from the picture are displayed in process mode.
- Picture selection via the group display (Page 163)
  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 is generated. This function can be used to update both a group display and other picture objects.

8.14.2 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 received and not acknowledged
	2	• W (WH, WL): – Warning High, Warning Low – black text on a yellow background – flashing if received and not acknowledged • T (TH, TL): – Tolerance High, Tolerance Low – white text on a blue background – flashing if received and not acknowledged If a warning message and a tolerance message exist simultaneously, the warning message has higher priority is displayed.
Process control alarm	3	• S: – AS process control, OS process control error – yellow text on a black background – flashing if received and not acknowledged • F: – AS process control error – yellow text on a black background – flashing if received and not acknowledged • MR: – Maintenance request – yellow text on a black background – flashing if received and not acknowledged

Message type	Field in the group display	Class
Operator control display	4	• O (OR): – Operator request – white text on a dark magenta background – not flashing if received
Lock messages	5	• X: – Messages locked – white text on a gray background – not flashing if received

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

Additional information

- Online Help for *WinCC Information System*

8.14.3 Configuring a group display

8.14.3.1 Group Display Configuration Options

Configuration 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 are known as message types. This term will be used below.
- Assignment of the message types to the individual command buttons of the group display. Up to eight command buttons can be configured for a group display. The default group display indicates five buttons.
  The message types are assigned to a command button using the bit number from the "EventState" tag. 16 different message types, which can alls be visualized, can be saved in the "Event State" tags. The individual bits of these tags are preconfigured as standard as indicated below and assigned to the bit numbers in the group display.

The bit configuration in the "Event State" tags

Bit in the "Event State" tags	Associated message type	Bit number
31 15 – Acknowledge bit	AH, high high alarm	1
30 14 – Acknowledge bit	AL, low low alarm	2
29 13 – Acknowledge bit	WH, high alarm	3
28 12 – Acknowledge bit	WL, low alarm	4
27	TH, tolerance high	5
26	TL, tolerance low	6
25 9 – acknowledge bit	S, process control message (system)	7
24 8 – acknowledge bit	F, process control message (failure)	8
23 7 – acknowledge bit	MR, preventive maintenance	9
22 6 – acknowledge bit	PM, process message	10
21 5 - acknowledge bit	PM, process message	11
20	OR, operator request	12
19	OM, operator message	13
18	AS, AS status message	14

Bit in the "Event State" tags	Associated message type	Bit number
17	OS, OS status message	15
16	X, 'out of service' message	16

M - preventive maintenance

SA – AS status

SO – OS status

Standard assignment of the message types to the bits in the "Event State" tags

The group display is based on the group value from the 32-bit "Event State" tags. This is the default for a group display:

Button in the group display	Bits in the "Event State" tags	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

8.14.3.2 How to Insert a Group Display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Object palette" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Enable the "Objects" checkbox.
   The object palette is opened.
4. Select the "group display" object in the object palette under "Smart objects".
5. Use the mouse to navigate to the drawing area.
   The mouse pointer changes into the group display cursor.
6. Holding the mouse, drag open a rectangle large enough to accommodate your group display.
7. Configure the group display.

   You can find information about this in the section "How to Configure a Group Display (Page 157)".
8. 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 Measuring Point" wizard.
     You can find information about this in the section "Connecting the Group Display to a Measuring Point (Page 158)".
   - If you wish to connect the group display to a picture, start the "Connect a Group Display to a Picture" wizard.
     You can find information about this in the section "Connecting the Group Display to a Picture (Page 160)".
9. Select the group display and then select the **View > Properties** menu command.
   The "Properties" dialog box opens.
10. Specify the parameters for the group display.

Further information

For further information, refer to the Online Help for the *WinCC Information System*.

8.14.3.3 How to Configure a Group Display

Requirement

The group display has been inserted in the process picture.

Procedure

1. Select the group display, and then select the **View > Properties** command.
   The "Object Properties" dialog box opens.
2. Select the property "Group display > Geometry" in the tree view.
3. Enter the value in the "Statics" column required for specifying the size of the group display over the corresponding attributes.

   Note

   If you enter "yes" for the attribute "Same size", all the boxes are set at identical sizes spread across the default total width.

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

4. Select the property "Group display > Message types" in the tree view.
5. Double-click the attribute "Message types".
   A list is shown with all the available message types.

   You can find further information in the section "Configuration Options for a Group Display (Page 154)".
6. Select the message type which you wish to configure and click "OK".
7. Perform the corresponding settings for display in process mode.
8. Follow this procedure for all the message types which you wish to show in process mode.
9. Select the property "Group display > Assignment" in the tree view.
10. Double-click the attribute "Message types for button [serial number of the button]".
    The "text input" dialog box is opened.
11. Use the bit to select the message type which you wish to assign to the button.
12. Click "OK".

    Note

    If you wish to assign multiple events to a button, enter the different bit numbers in order, 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 which is farthest to the left is visualized.

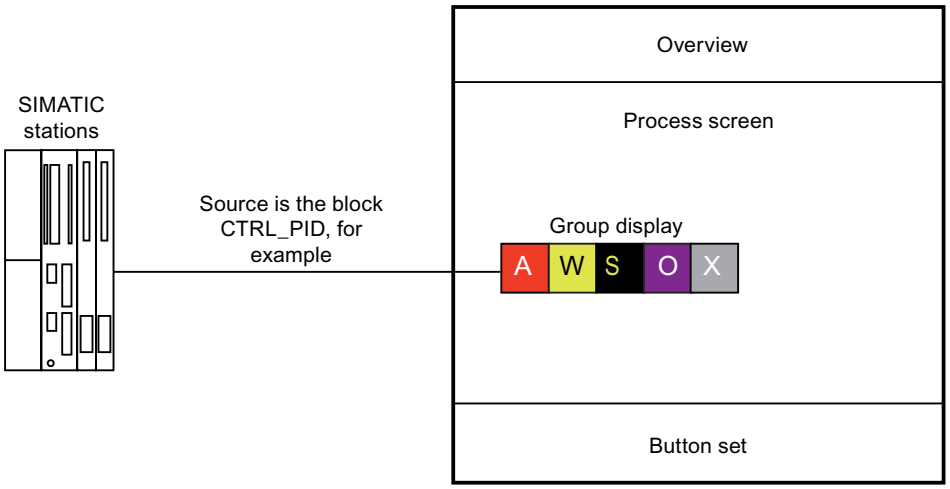
    You can find additional information about this in the section "Group Display Configuration Options (Page 154)".
13. Click the title bar and select the command **Close** in the shortcut menu.

8.14.4 Interconnecting the group display to a process tag

8.14.4.1 Interconnecting the group display to a process tag

Connection of Group Display to a Process Tag

If you connect a group display to a block using a direct connection, 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".



Use the "Connect group display to PCS 7 process tag" dynamic wizard to make the interconnection.

8.14.4.2 How to interconnect a Group Display to 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" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Enable the "Dynamic Wizard" checkbox.
4. Select the required group display in the process picture.
5. Select the "Standard dynamics" tab in the toolbar.
6. Double-click the entry "Connect group display to PCS 7 process tag".
   The wizard is opened.
7. Click the "Next" button in the first step of the wizard.
   The "Set options" step is opened.
8. In the "Set options" step, click the "Browse" button next to the input box.
   The tag selection dialog box opens.
9. Select the required block in the "List of all tags" and click "OK".
   The required block is copied and the tag selection dialog box is closed.

   Note

   If there are many tags in your project, it is absolutely essential to use the filter function. For additional information, refer to the Online Help for the *WinCC Information System*.

10. Click "Next".
    The "Done!" step is opened.
11. Check your settings.
12. Click "Finish".
    The group display is connected to the block.

8.14.5 Interconnecting group displays with pictures

8.14.5.1 Interconnecting group displays with pictures

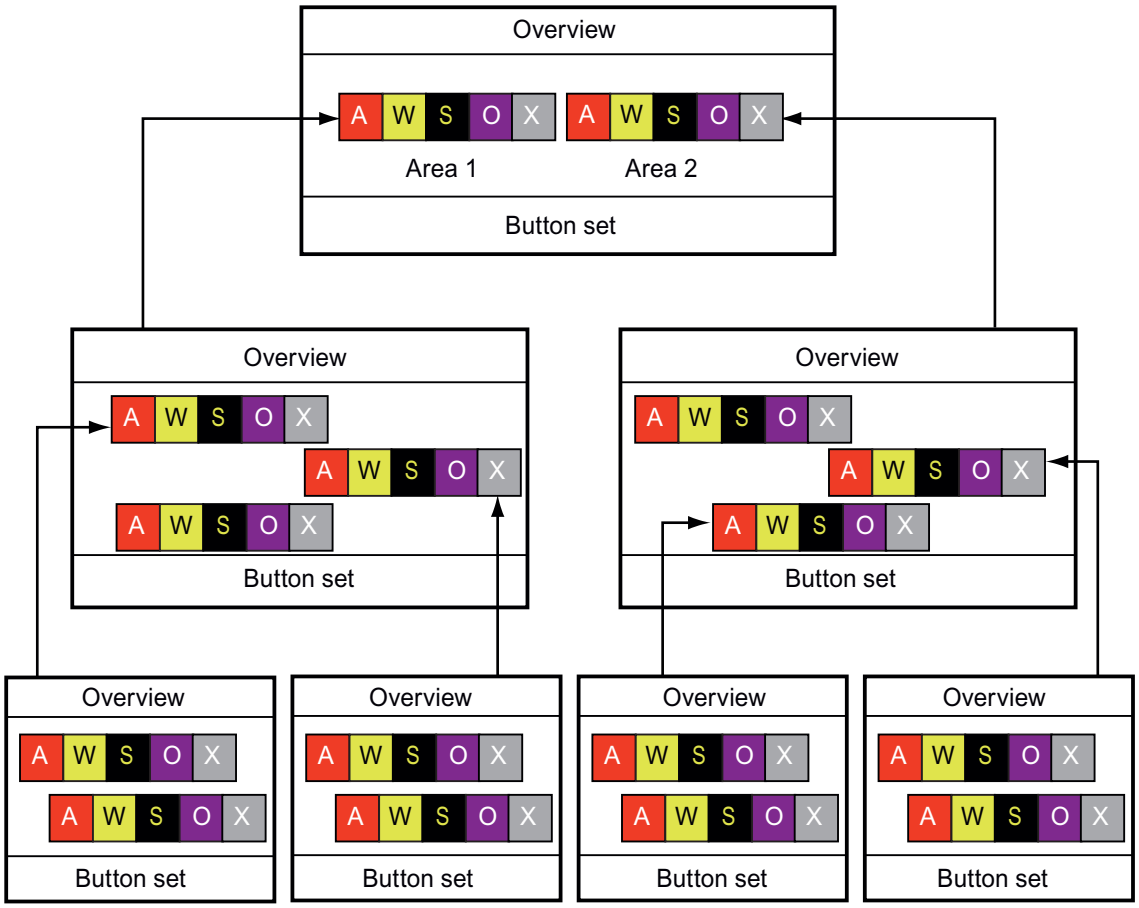
Introduction

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, which leads the operator to pictures in which danger states are displayed, e.g. alarms. The picture hierarchy is derived from the plant hierarchy and is 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 "Connect a Group Display to a Picture" Dynamic Wizard.
- Carry out creation automatically

Creating the group display hierarchy using the Dynamic Wizard

The group display must be configured in every picture according to the picture hierarchy.

Configure the interconnection to the picture using the "Connect a Group Display to a Picture" Dynamic Wizard.

You can configure an action with the "Picture selection via the group display" Dynamic Wizard. Then, for example, if there is an incoming message during process control you can switch with a mouse-click directly to the picture in which the message is generated.

Creating the group display hierarchy automatically

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. This is positioned automatically in the top left corner of a process picture.

Additional information

For additional information, refer to the *WinCC Information System* Online Help.

8.14.5.2 How to automatically create a group display hierarchy for pictures

Requirement

The WinCC project is opened.

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.

Further information

For further information, refer to the Online Help for the *WinCC Information System*.

8.14.5.3 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" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Enable the "Dynamic Wizard" checkbox.
4. Select the required group display in the process picture.
5. Select the "Standard dynamics" tab in the toolbar.
6. Double-click the entry "Connect group display to picture".
   The wizard is opened.
7. Click the "Next" button in the first step of the wizard.
   The "Set options" step is opened.
8. Click "Browse" next to the input box in the "Set options" step.
   The "Picture browser" dialog box opens.
9. Select the required project and click "OK".
   The picture is applied.
10. Click "Next".
    The "Done!" step is opened.

11. Check your settings.
12. Click "Finish".
    The group display is connected to the picture.
13. Finally, define the event, e.g. a right-click of the mouse, which is to be used to call up the picture.
    There is further information available on this in the section "How to Define the Type of Picture Selection (Page 163)".

8.14.5.4 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 linked to a picture.

Procedure

1. Open the process picture in the Graphics Designer.
2. If the "Dynamic Wizard" toolbar is not visible, select the menu command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Select the "Dynamic Wizard" check box.
4. In the process picture, select the required group display.
5. In the toolbar, select the "Picture Functions" tab.
6. Double-click "Picture selection using the group display".
   The wizard opens.
7. Click "Next" in the first step of the wizard.
   This opens the "Select Trigger" step.
8. Select an operator action to be used open the picture in the group display and click "Next".
   The "Done!" step opens.
9. Check your settings and click "Finish" if no corrections are necessary.
   The group display is interconnected with the operator action.

Creating process pictures - advanced

9

9.1 Overview of Additional Options for Creating Process Pictures

Additional options

In addition to simple standard objects, PCS 7 offers the following objects for creating process pictures and customizing settings of complex plant structures:

Object	Description
Faceplate	Faceplates visualize specific values of the respective technological block in the automation system in process mode. Block icons are used to call faceplates in process mode.
Alarm message	You can view messages directly in the process picture via a standard object in the Graphics Designer.
User object	A user object is an object in the Graphics Designer that you can create from individual standard objects.
User object template	A user object template is an extension of user 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.

9.2 Function and Use of Block Icons and Faceplates

9.2.1 Using Faceplates

Introduction

Faceplates visualize specific values of the respective 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. To display these tags, 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

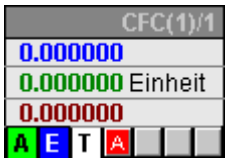
Rule:
Name of the project folder: …\Program Files\Siemens\STEP7\S7Proj\[Project name]
Name of the project folder: The project folder "[Project name]_Prj" is limited to 8 characters.

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".

9.2.2 Relationship between Faceplates and Block Icons

Standard block icons

For each technological block, PCS 7 provides you with a corresponding block icon. 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 user objects.



Using block icons

There are two options for using block icons:

- 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.
- You can insert additional block icons into a process picture yourself because the measuring points are arranged in the plant hierarchy in such a way that they are not covered by the automatic function.
  In this case you should use the block icons from the template file:
  - For blocks from the PCS 7 standard library from the template file "@template.pdl"
  - For blocks from the PCS 7 advanced process library from the template file "@TemplateAPL.pdl"

  Use the functions "copy" and "paste" to insert the block icons into the process picture. Then establish a connection by dragging these block icons to a measuring point.

You can find the background information for the "Create/Update Block Icons" function in the section "Procedure for Creating Block Icons (Page 71)".

9.2.3 Block Icons and the @PCS7TypicalsAPL.pdl file

File *@PCS7TypicalsAPL.pdl*

The file *@PCS7TypicalsAPL.pdl* contains all the defaults for the block icons. If you execute the "Create/Update Block Icons" function, PCS 7 automatically uses block icons from this file. The file is installed as standard during the installation of PCS 7.

Changes in the *@PCS7TypicalsAPL.pdl* file

If you wish to amend the standard block icons or create your own block icons, use the 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, use your own block icons for this.

CAUTION
Under no circumstances should you amend the original file, as changes to the original file will be overwritten during updates. Essentially create a new file starting with the fixed name component *@PCS7Typicals.pdl* . You can specify the rest of the file name yourself. If you want to amend existing block icons, copy the desired block icon to the *@PCS7TypicalsAPL.pdl* file in the new file and adapt it there. You can create up to 10 different template files for the block icons.

Different versions of block icons

There can be several versions of block icons for one measuring point. 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 there the value "@VlvL/2". 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.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.

Further information

Refer to chapter *"Configuring Block Icons"* in the online help for Advanced Process Library for further information on configuring block icons.

9.2.4 Block Icons and the @TemplateAPL.pdl file

File *@TemplateAPL.pdl*

The *@TemplateAPL.pdl* file invariably contains the same block icons as the file *@PCS7TypicalsAPL.pdl* with one important difference: The "type" attribute has different values in each of the two files.

Manually inserting block icons

If you wish to manually insert additional block icons in a process picture, and these are not automatically derived from the plant hierarchy, you must use the file *@TemplateAPL.pdl*.

If, for example, you want to show an additional measuring point in a process picture. This block icon will be deleted the next time the function "Create/Update Block Icons..." is carried out, as the measuring point is not located at the required position in the plant hierarchy. Only by using a block icon from the *@TemplateAPL.pdl* file can you prevent this block icon from being deleted.

NOTICE
If you have amended the block icon in the *@TemplateAPL.pdl* file, before you carry out a software update of PCS 7 you must create a backup copy, as this file will be overwritten.

9.2.5 Display Types of Faceplates

Introduction

When you connect any object from the object palette of the Graphics Designer, 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 display > Working area This display fills the entire working area. It is not possible to move the faceplate or change its size. The faceplate is deselected by opening a new process picture using a command button in the overview area. • Loop display > Process window The information is displayed 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 information is displayed in a separate window that the plant operator can move and close. In contrast to the loop display, only one view is active in the group display. The plant operator can open another view by selecting it from a drop-down list box. The plant operator can switch from the group display to the loop display in the process window by clicking a command button in the group display.

9.2.6 Editing Faceplates - Faceplate Designer

Editing faceplates

You can edit existing faceplates to customize them for your exact requirements. You can also create entirely new faceplates.

Faceplates are PDL files that you can modify or create from scratch in the WinCC Graphics Designer in combination with the Faceplate Designer.

The Faceplate Designer provides support for creating faceplates. You can find detailed information about creating faceplates with the Faceplate Designer in the programming guide *Process Control System PCS 7; Programming Guide for Blocks*, under the topic “Configuring Faceplates“.

Additional information

For additional information, refer to the Online Help for the *WinCC Information System*.

9.2.7 Overview of Block Icon and Faceplate Configuration Tasks

Introduction

If you want to manually insert block icons in 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	What?
1	Inserting a block icon (Page 172)
2	Connecting a block icon to a process tag (Page 172)

Option 2

In exceptional cases, you can use the following procedure:

Step	What?
1	Connecting any object to a faceplate (Page 173)

9.2.8 How to Insert a Block Icon

Procedure

1. Open the process picture in the Graphics Designer.
2. Also open the @Template.pdl picture.
   This picture provides various technological block icons for use as templates..
3. Select the required block icon in this picture, and then select the **Edit > Copy** command.
4. Change to your process picture and select the **Edit > Paste** command.
   The block icon is inserted into the process picture. This block icon is not yet linked to a process tag.

9.2.9 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. Select the menu command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Select the "Tags" check box.
4. In the process picture, select the required block icon.
5. Navigate to the CFC chart containing the required process tag in the tree view below "ES Tags".

   Note

   In the detailed window, you will see only the process tags that match the selected block icon.

6. Drag-and-drop the required block from the detail view onto the corresponding block symbol.
   The block symbol is automatically interconnected with all necessary tags of the process tag.
7. Repeat steps 3 to 5 for all other block icons.
8. Save and close the process picture and close the @Template.pdl file.

9.2.10 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" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
4. Enable the "Dynamic Wizard" checkbox.
5. Click "OK".
6. Select the "Picture functions" tab in the Dynamic Wizard.
7. Double-click in the list on "Picture selection via process tag".
   The "Welcome to the Dynamic Wizard" dialog box opens.
8. Click the "Next" button in the first step of the wizard.
   The "Select trigger" step is opened.
9. Choose the desired trigger.
   In this way you define the event through which the operator can open the faceplate at runtime.
10. Click "Next".
    The "Set options" step is opened.
11. In the "Set options" step mark the desired tag structure type in the list and click "Next".
    The next "Set options" step is opened.
12. Click the "Browse" button next to the input box.
    The tag selection dialog box opens, showing you the process tags corresponding to the previously selected structure type.
13. Select the required process tag in the detail view and click "OK".
    The process tag is copied and the tag selection dialog box is closed.
14. Activate the check box of the desired display type.
    You can find additional information about this in the section "Faceplate display types (Page 170)".
15. Click "Next".
    The "Done!" step is opened.
16. Check your settings and click "Finish".
    The picture object is connected to the desired process tag.

9.3 Displaying alarm messages

9.3.1 Using an Alarm Control message window

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 alarm system (Page 207)"

9.3.2 How to insert an Alarm Control

Procedure

1. In the Graphics Designer, open the process picture in which you would like to integrate a message window.
2. If the "Object palette" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Enable the "Objects" checkbox.
4. Click "OK".
   The object palette is opened.
5. In the toolbar, select the "Controls" tab.
6. Open the ActiveX Controls folder.
7. Select the WinCC Alarm Control.
8. Move the mouse pointer to the drawing area.
   The mouse pointer changes according to the selected object.
9. Hold down the mouse button and draw a rectangle matching the size of your object.
   The "Properties of WinCC Alarm Control" dialog box opens.
10. Set the WinCC Alarm Control properties.
    Information about the individual input boxes and check boxes is available in the *WinCC Information System* Online Help.

11. Click "OK".
    The "Properties of WinCC Alarm Control" dialog box closes.
12. Select the **View > Properties** command to define the properties and events.
    The "Object properties" dialog box opens.
    Additional information about the individual input boxes and check boxes is available in the *WinCC Information System* Online Help.
13. Define the properties and events.
    Additional information about the individual input boxes and check boxes is available in the *WinCC Information System* Online Help.
14. Close the "Object properties" dialog box.

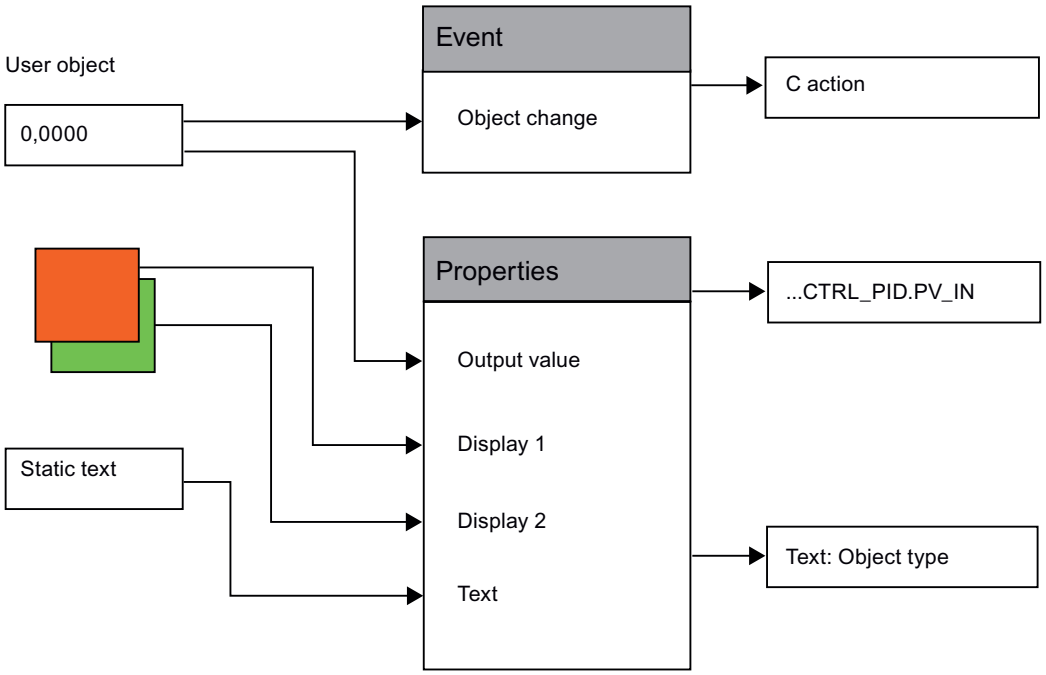
9.4 Creating and implementing user objects

9.4.1 Creating and implementing user objects

User Objects

A user object is a dynamic object consisting of single 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 single objects. You specify the properties **once** for all attributes that remain constant. You can then always implement the user object without having to configure single objects and assemble them as an object for each application.

For each single object, only those properties of the user object that might need to be changed are made visible. You can assigned these properties with variables and make them dynamic. Thus, only selected properties are visible for each object, which simplifies linkage of objects to tags. The properties can also be accessed by other WinCC applications, such as scripts.



User object applications

The creation of custom user objects is useful in the following situations:

- You wish to display information about particular technological blocks in process mode which cannot be provided by standard faceplates.
- You have created your own block type by compiling a CFC chart in the CFC editor.

Storing user objects for multiple applications

You store user objects in a library to facilitate implementation of multiple applications. User objects taken from a library are copies of the original. In this way, you can make subsequent, specific changes and adjustments to each copy – if necessary – and they will not be overwritten when the original is modified.

Note

Clicking the user object to display a faceplate is not a default option.

9.4.2 Advantages of User Objects as Compared to Single Objects

Advantages of user objects

Creating a user object has the following advantages as compared to using single objects:

- When you work with user 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 user object copies, rather than on each single object.
- You can modify user objects and supplement them with additional objects at any time.
- You can configure user 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.

Further information

- Online Help for *WinCC Information System*

9.4.3 Overview of Configuration Tasks for User Objects

Overview of the Steps in Configuration

Creating user objects involves the following steps:

Step	Content
1	Creating a user object from individual objects (Page 179)
2	Configuring a user object (Page 180)
3	Configuring user object properties (Page 182)
4	Storing a user object in a library so that it can be reused (Page 183)
5	Inserting and instancing a user object in the process picture (Page 184)
6	When changes are made: Edit the user object (Page 185)

9.4.4 How to Generate a User Object

Procedure

1. Open a process picture in the Graphics Designer.
2. Insert a single object that you want to integrate into the user object, for example, a group display, a status display or static text.
3. Click "Cancel" in any open configuration dialog box.
   The program closes the configuration dialog box. You will not connect the tag until later.
4. Select the object, and then select the **View > Properties** command.
   The "Object Properties" dialog box opens.
5. In the "Object name" attribute, enter a brief, self-explanatory name for the single object.
6. Define all static properties such as colors or font attributes.
   Assign dynamic properties to the user object in a separate step.
7. Click the title bar and select the menu command **Close** in the shortcut menu.
8. Repeat steps 2 to 7 for all remaining single objects.
9. Position the single objects as they are to appear in the user object.
10. Drag a frame around all the single objects.
    All objects are selected.
11. Select the **Edit > User Object > Create** command.
    The "User Object" configuration dialog box opens. In this dialog box, you select all properties that apply to the entire user object.

9.4.5 How to Configure a User Object

Procedure

1. Open the configuration dialog box for the user object.
   - If you have created a new user object, the configuration dialog box is automatically opened.
   - If you wish to make later changes to the configuration, select the **Edit > Configuration dialog box...** command.
2. Enter a meaningful name for the user object in the "Object type" input box.
3. Should you wish 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 **Topic Selection**.
   - Go to the "All topics" list and select the topic which you will like to add to the "Selected topics" list.
   - Click the arrow button.
     The topic is copied over.
   - Click "OK".
4. In the "Objects" list, select the object from which you wish to copy properties for the user object.
   The "Properties" list contains all the properties which are always available for the selected object.
5. Drag the required property to the "Selected properties" list under "User-defined".
   The property is inserted along with the corresponding object name. A particular value can later be assigned to this property.

Note

If you prefix an "@" character to 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 further information about scripts in the section "Global Script function (Page 377)".

NOTICE

If you use a "group display" in the user object, the following have to be defined as properties for the user objects:

- "Group value"
- "Relevant to group"

This is the only way of recording and acknowledging states.

6. Repeat steps 4 and 5 until you have defined all the properties for this new user object.
7. Select the "Event" tab.

8. Go to the "Objects" list and select the object for which you wish to specify an event.
   All the events which are essentially available for use for the object in question are shown in the "Event" list.
9. Now drag the required event to the relevant entry in the "Selected events" list, e.g. drag the event "mouse click" to the "mouse" entry.
   You can link this event to a script, for example, later on.
10. Repeat steps 7 through 9 if you wish to define further events.

NOTICE
Make sure not to define events simultaneously for the entire user object and for individual objects. This can lead to overlaps in the execution of the event in process mode.

11. Click "OK".

9.4.6 How to Configure the Properties

Introduction

Once you have specified the properties for the user object in the configuration dialog box, enter the values for these properties. You define only the dynamic properties in the configuration dialog box. You have already defined the static properties for the single objects.

Procedure

1. Select the user object.
2. Select the **View > Properties** command.
   The "Object properties" dialog box opens.
3. In the tree view, select "User Object".
4. Switch to the detailed window and enter a descriptive name for the user object in the "Object name" attribute.
5. Select the "User-Defined" entry from the tree view.
   This entry contains all necessary properties you set in the user object configuration.
6. Change to the detail view and double-click the "Dynamic" column of the selected attribute.
   The program outputs a rectangle.
7. Enter the tag to be associated with the attribute. Enter the tag name in a generally valid format: Tag name with leading dot, for example, ".PV_OUT".
8. Press ENTER to confirm your entries.
   The tag is entered in the "Dynamic" column and the color of the "light bulb" icon turns green.
9. Repeat steps 5 to 8 to link tags to all the other attributes.

Note

Connect the "Group value" attribute with "[name of block].EventState".

Enter "yes" for the "Group value" attribute.

9.4.7 How to Store a User Object

Procedure

1. Open the Graphics Designer.
2. Select the **View > Library** command.
   The program opens the libraries.
3. If you want to create a large number of user objects, select "Project library" in the tree view and click "New Directory". A new folder is created.
4. Select the new directory. Select the menu command **Rename** in the shortcut menu and enter a meaningful name for the library.
5. Select the user object to be written to the library from the process picture, and then select the **Edit > Copy** command.
6. Switch to the library and, in the tree view, select the directory in which you want to place the user object.
7. Click "Paste" on the library toolbar.
   The program writes the user object to the library.
8. Open the shortcut menu (right-click) of the user object and select the menu command **Rename**.
9. Enter a descriptive name for the user object. Use the same object name that you used in the user object properties. This ensures consistency in the management of user objects.

9.4.8 How to Insert a User Object

Requirement

The "project library" contains the user object.

Overview of the Steps in Configuration

You insert the user object in two steps:

Step	What?
1	Inserting the user object in the process picture
2	Connecting the user object to an actual block

Step 1: Inserting a user object

1. Open Graphics Designer.
2. Select the **View > Library** command.
   The program opens the libraries.
3. In the tree view select the directory in which you saved your user objects.
4. In the detail view select the user 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 **Edit > Insert**.
   The user object is inserted in the process picture.

Step 2: Connecting user object with block

1. If the "Dynamic Wizard" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
2. Enable the "Dynamic Wizard" checkbox.
3. Select the "Standard dynamics" tab in the toolbar.
4. Double-click the entry "Connect prototype with a structure or rename existing".
   The wizard is opened.
5. Click the "Next" button in the first step of the wizard.
   The "Set options" step is opened.
6. In the "Set options" step click the "Browse" button next to the "Structure instance name" input box.
   The tag selection dialog box opens.

7. In the detail view select the required block and click "OK".
   The required block is copied and the tag selection dialog box is closed.

   Note

   If there are many tags, use the filter function in this dialog box. For further information, refer to the Online Help for the *WinCC Information System*.

8. Click "Next".
   The "Done!" step is opened.
9. Check your settings and click "Finish".
   In one step, the attributes of all properties are connected to an actual block.

9.4.9 How to Edit a User Object

Introduction

If you wish to insert a user object at a later point in time, proceed as follows.

Procedure

1. Open the process picture in the Graphics Designer and select the user object.
2. Select the **Edit > User Object > Edit...** command.
   You can select the object separately.

CAUTION
Do not delete the user object under any circumstances as this would cause all configurations to be lost.

3. Click in a free area of the drawing page.
   The program deletes all markings.
4. Select the single object you wish to edit.
5. Select the **View > Properties** command.
   The "Object properties" dialog box opens.
6. Modify the required properties.
7. Select all object using the frame function of the mouse.
   This highlights all objects selected.
8. Select the **Edit > User Object > Finish Editing....** command.
   Editing is now completed.

9.5 Working with user object templates

9.5.1 Using and Creating User Object Templates

User object templates

If you have created user objects, you can use them to create user object templates. When you copy user objects from the user object template in process pictures, instances are generated. The instances can be updated **centrally**.

Comparison of user objects and user object templates

The following table presents a comparison of user objects and user object templates. You decide whether to use a user object or a user object template depending on your requirements for an object.

User Objects	User object templates
When you use a user object from a library, you create a copy of the user object. You cannot subsequently interchange these objects.	When you use a user object template, you create an instance. You can make master changes to the template and then transfer these changes to all objects that are based on the template.
You can only change individual user objects and only directly in the process picture.	You can edit the properties of a user template quickly and conveniently in an external program, such as MS Excel.

Requirements for master changes

The following requirements must be satisfied for you to use the master change function:

- Each object that is based on a user object template has a type identifier. For this reason, you define a "type" property in the properties of the user object template, which is carried over to the instance of the user object template. The wizard uses this property to uniquely identify these objects.
- The user object templates are stored in a template file. This template file can be identified by its name syntax:
  @[TemplateFileName].pdl.

9.5.2 Properties in User Object Templates

Properties in User Object Templates

You need to define a variety of properties in user object templates. To do so, you first insert picture objects to which you then assign particular properties. The picture objects can then be used as a user object template. The "IO Field" smart object is best suited for this purpose, because it is language-independent and you only have to configure one language.

Property	Requirement	Purpose
type	When all functions of the Graphic Object Update wizard are to be used	Used for identification purposes when you work with individual wizards of the Graphic Object Update Wizard
servername	When a faceplate is to be called	Designates the faceplate that can be called from this user object with a mouse click
tag name	When a faceplate is to be called	Assigns the instance name to be used to call the faceplate – this corresponds to the so-called tag prefix
tag/ NameOfTag	Not mandatory and not supported by default	Used to enter static text as a type of object header or name – this text is visible in the process picture and can be imported or exported and edited in a CSV file

9.5.3 User 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:

- "Export picture objects (Page 188)"
- "Import picture objects (Page 188)"
- "Updating the picture objects (Page 191)"
- "Changing the link to the tag (Page 192)"

9.5.4 Wizards for Importing and Exporting 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 user 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 user objects in a process picture from a CSV file. In this process, **all** user objects in the process picture and the template file are first deleted.
You normally execute this function if you previously started the "Export Picture Objects" wizard and you edited the export data in the CSV file.
The OS tag names of the import file are not checked to ensure that they are valid or that they exist in the WinCC tag set-up.

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 user object satisfies the following requirements:	... then the following actions are carried out during the import process:
• Present in the template file • Present in the process picture • Present in the CSV file	... all user objects in the process picture are initially deleted ... all user objects are then reimported from the CSV file into the process picture
• Present in the process picture • Present in the template file • Not present in the CSV file	... all user objects in the process picture are initially deleted ... all user objects are then reimported from the CSV file. Note that in this process, user 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 those user objects which are actually present in the template file are deleted. If there are user objects in the process picture which are not present in the template file, the import function is closed with an error message.

NOTICE
Before executing the import function, be sure to make a backup copy of the process picture to avoid accidentally deleting user objects from your process picture.

CAUTION
As block icons are designed as user objects, they can be affected by the import function.

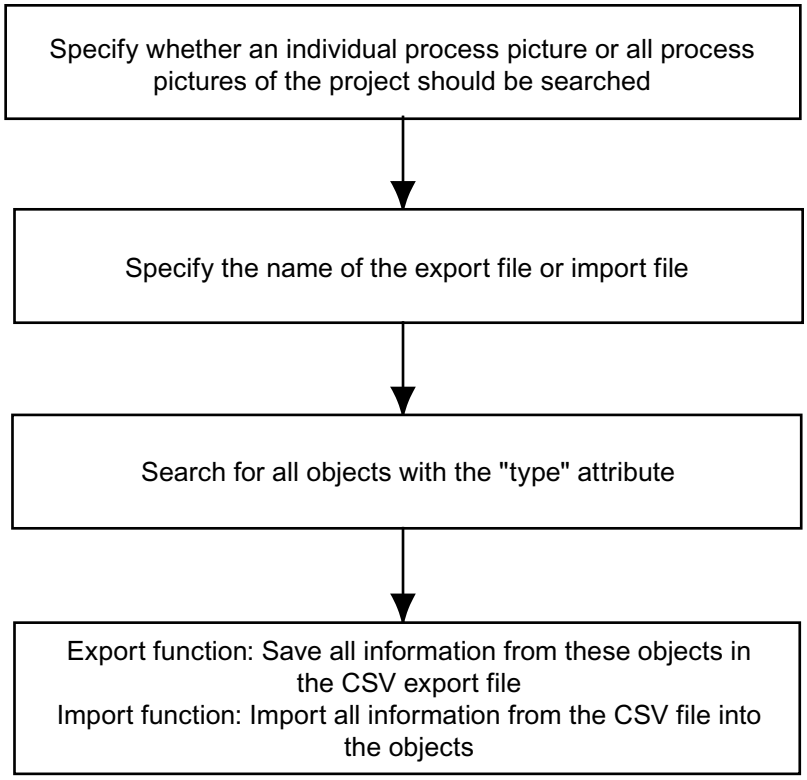
Additional information

Additional information about the import/export file and the configuration file is available in the *WinCC Information System* Online Help.

9.5.5 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.

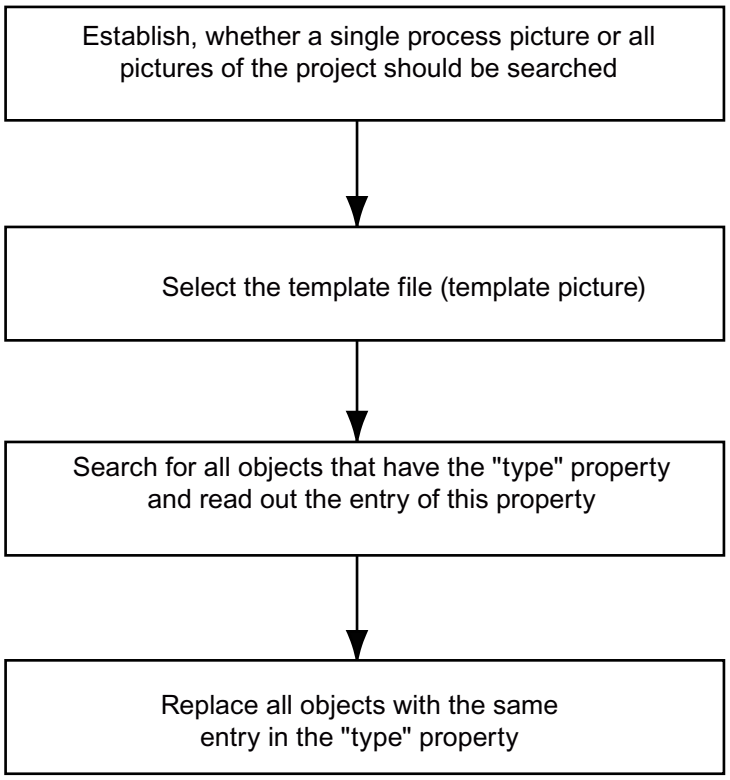
9.5.6 Wizard for Updating Picture Objects

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 user object following a change to the central template.

Flow chart



9.5.7 Wizard for Modifying a Tag Connection

Change a Tag Connection" wizard

The "Change a Tag Connection" wizard is used to make subsequent modifications to individual tag connections of user object instances in process pictures, for example, an interconnection to another AS block instance.

This wizard enables you modify a dynamic link to a user object. In the process, the instance name in front of the period is replaced in the tag. Dynamics with internal tags are not affected.

9.5.8 How to Create a User Object Template

Setting properties

Configure the relevant properties and attributes in the user object template.

Table 9- 1 Properties and attributes of a user object template

Property > Attribute	Entry	can/must
Object name	type	must
Other > Display	no	must
Output/Input > Data format	String	must
Output/Input > Output value	[Entry for the "type" property] Generally speaking, you will have to enter the name of the relevant block.	must

If a faceplate is to be called from the user object, the following objects are required in the user object template.

Table 9- 2 Objects in the user object for calling a faceplate

Object	Property > Attribute	Entry	can/must
I/O field1	Object name	Tag name	must
	Other > Display	no	must
	Output/Input > Data format	String	must
I/O field2	Object name	Server name	must
	Other > Display	no	must
	Output/Input > Data format	String	must
I/O field3	Object name	Name of tag	can
	Other > Display	yes	can
	Output/Input > Data format	String	must

Procedure

Note

To create a user 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.

1. Open a new picture in the Graphics Designer.
2. Insert the "I/O field" object and define the properties outlined which are described in the table "Properties and attributes of a user object template" above.
   This I/O field is used to store specific information which is required to call the different wizards for processing changes:
3. Should you wish to call a faceplate from this user object, insert the objects in accordance with the table "Objects in the user object for calling a faceplate" above and configure the specified properties and attributes.
4. Insert all the other objects **without** a fixed tag link, e.g. group displays or I/O fields.
5. Mark the individual objects and select the menu command **Edit > Create user object**.
   The user object is created.
6. Add the topic "User-defined" to the selected properties and rename it "General".
   You can also enter any other name.
7. Enter the name of the relevant block, e.g. "Valve", in the "Object type" field of the configuration dialog box.
8. Execute the properties for the following objects in the configuration dialog box and define the settings for the attribute name and the name of the property:
   - "Type" object:
     Set the property name under property "output value", attribute "type" to "type".
   - "Tag_name" object
     Set the property name under property "output value", attribute "tag name" to "tag name".
   - "Name_of_tag" object
     Set the property name under property "output value", attribute "tag" to "tag".
   - "Server_name" object
     Set the property name under property "output value", attribute "server name" to "server name".
9. Execute the properties of the other objects that you require for the user object template, e.g. "group value", "relevant to group" or "output value".
10. Click "OK".
    The procedure is the same as the procedure for creating a user object.
11. Select the menu command **View > Properties**.
    The "Object properties" dialog box opens.

12. Specify the following object properties:
    - Select the name of the object in the directory window and enter the name of the block in the "object name" attribute.
    - If you have not set the properties in step 2 yet, enter the name of the relevant block under property "General" / attribute "type".
    - Enter all the other user-defined properties in accordance with the project requirements.
13. Create further user-object templates.
14. Save the file under a new meaningful name: Prefix the file name with the character "@". The file is saved and characterized as a template file by the character "@".

9.5.9 How to Work with the Graphic Object Update Wizard

Introduction

The wizards included in 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 9- 3 Overview of wizards

If you …	… then use the wizard
wish to update picture objects,	"Updating picture objects" Specify the template file in the wizard where you have saved the updated user object template. As a result, the user object template can be replaced in a picture by the updated template.
wish to swap interconnections,	"Swapping user object interconnections" In the wizard, specify the new structure type which is to be used for interconnecting the user object templates in the picture.
wish to export picture objects,	"Export picture objects" 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 names" option: This splits the tag name in accordance with the plant hierarchy, giving you a greater overview and better editing options.
wish to import picture objects,	"Import picture objects" Specify the following in the wizard: • Name of the import file • Name of the template file in which the user object templates are saved. Bear in mind that the import file only contains data from objects which 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 wish to execute one of the following functions:
   - Update user object
   - Export/import information from/to this user object template
   - Exchange user object interconnection
3. If the "Dynamic Wizard" toolbar is hidden select the command **View > Toolbars** command.
   The "Toolbars" dialog box opens.
4. Enable the "Dynamic Wizard" checkbox.
5. Select the "Picture functions" tab in the toolbar.
6. Double-click the required wizard. The table above contains a description of the wizards.
7. Click "Finish".
   The wizard is closed.

9.6 Using picture windows

9.6.1 Picture window

Introduction

Picture windows are a type of "container" inside a process picture. A picture window can accommodate a picture, for example, one you 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 interconnection in this picture: That is, the tags are visualized by a generally valid name such as ".PV_IN" and are not assigned a 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.

Further information

For further information, refer to the Online Help for the *WinCC Information System*.

9.6.2 How to Use a Picture Window

Setting properties

For picture windows, configure the following properties:

Property	Attributes	What?
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
Other	• Display	yes - this ensures that the picture window is always visible
	• Picture name	Name of the picture which is to appear in the picture window, e.g. "controller.pdl"
	• Tag prefix	Instance name of the tags up to the point, e.g. "RMT1/FC111/CTRL_PID"

Overview of the configuration steps

When using a picture window, proceed in two steps:

Step	What?
1	Create 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 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 user object: This involves inserting the user 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 "Object palette" toolbar is hidden, select the **View > Toolbars** menu command.
   The "Toolbars" dialog box opens.
3. Enable the "Objects" checkbox.
   The object palette is opened.
4. If necessary, select the "Standard" tab in the object palette.
5. Select the "Picture window" object in the "Smart objects" entry.
6. Use the mouse to navigate to the drawing area. Pressing the mouse button in, drag open a rectangle.
7. Select the **View > Properties** command.
   The "Object properties" dialog box > "Properties" tab opens.
8. Define the settings for the properties and attributes in accordance with the table above.
9. Click the title bar and select the command **Close** in the shortcut menu.

9.7 Working with cross-reference lists

9.7.1 General Information - 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 points of use for specific objects, such as tags and pictures, in a cross-reference list.
- You can delete a tag at a point of use by switching directly to that point of use from the cross-reference list.
- You can modify the name of one or more tags via the "Linking" 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 *WinCC Information System* Online Help.

9.7.2 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 nonexistent 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 continuous function chart in the plant hierarchy with block instances that you have interconnected in the process picture.
- You have inserted a dynamic object or a user object, for example, in a process picture, but you have not yet interconnected it to a tag.

Overview of the Steps in Configuration

Follow the steps below when working with cross-reference lists in the PCS 7 environment:

Step	What?
1	Creating a cross-reference list (Page 203)
2	Switching to a location (Page 204)
3	Making corrections (Page 204)

9.7.3 Comparison of Process Object View and Cross-reference Lists

Introduction

Depending on the type of work you wish to accomplish, the "Picture Object" 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 nonexistent tags.
- This WinCC function enables you to make corrections to the interconnections.

Process object view, "Picture Object" tab

You use "Picture Object" 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.

9.7.4 How to Generate a Cross-reference List

Procedure

1. Open WinCC Explorer.
2. In the WinCC Explorer tree view, select the "CrossReference" editor.
3. Select the **Open** command from the shortcut menu.
   The "Cross Ref" dialog box opens.
4. Select the **File > New** menu command.
5. If data management has not been created yet or is not up-to-date in the cross reference, a message is shown to indicate this.
   Click "Update".
   The update is started and the progress of the process is shown.
   Following completion of the update, the "Edit filter" dialog box is opened.
6. Define your filter settings:
   - Select the entry "Tags" from the drop-down list in the "Search for" group.
   - Enable the "Used non-existent (not selectable)" checkbox in the "Search for" group.
   - Enable all the checkboxes in the "Search in" group.
7. Click the "Start search" button.
   The data window is opened and shows all the tags which correspond to the filter criterion setting.
   The cross-reference list also contains all the tags which are of no consequence to you. These tags are characterized by an "@" prefix before the tag name.
   Further information about the data window and about the individual columns is available in the *WinCC Information System* Online Help.
8. Select **File > Save** to save the cross-reference list that you have created.
   The "Save As" dialog box opens.
9. Enter a descriptive name.
   The file appears in the WinCC Explorer detail window.
   You can open the file again at any time and also edit the filter conditions.

9.7.5 How to Switch 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 **Edit > Go To** and search for the relevant location.
   - If you have marked an entry in the "Containing Element" column and execute the command, the Graphics Designer with the relevant process picture is opened.
   - If you have marked an entry in the "Object" column and execute the command, the Graphics Designer with the relevant process picture is opened, and the sought-after object is automatically marked within the process picture.
4. If necessary, make the requisite corrections.

9.7.6 How to Make Corrections

Introduction

You can correct faulty tag connections in the following editors:

- In the Graphics Designer, you can correct the tag connection using the tag selection dialog box.
- In the "Cross Reference" editor, you can use the "Linking" function, which is described below.

Procedure

1. Open the cross-reference list in the "Cross Reference" editor.
2. Select the required "Containing Element" or the "Object" for which you wish to correct the interconnection.
3. Select the **Edit > Rewire** command.
   The "Rewire" dialog box opens.
4. Click "Browse" next to the "Replace by" input box.
   The tag selection dialog box opens.
5. Select the required tag and click "OK".
   The program accepts the tag and closes the tag selection dialog.
6. Click "Replace".
   The tag interconnection is modified.
7. Click "Close".
   The program closes the "Rewire" dialog box. When the cross-reference list is updated, the tag will no longer be displayed as "Used, not existing".

9.8 Function of the Picture Tree Manager

9.8.1 Function of the Picture Tree Manager

Picture Tree Manager and plant hierarchy

After you compile the OS, the Picture Tree Manager displays the structure of the plant hierarchy. In order for this to be possible, you must have already selected this option in the plant hierarchy settings of SIMATIC Manager. Picture Tree Manager returns the hierarchy levels you created in SIMATIC Manager under the same names. Picture Tree Manager returns the hierarchy level named "Plant1" which you created in SIMATIC Manager, for example. Picture Tree Manager also shows which picture is contained in this hierarchy folder.

At the bottom of the Picture Tree Manager, you will find all of the pictures that are not inserted in the plant hierarchy. 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 of the process picture.

Requirements

Certain requirements must be satisfied for the plant hierarchy structure to be displayed in the Picture Tree Manager:

- The Picture Tree Manager only displays hierarchy folders in which you have inserted a picture.
- A picture must always be inserted in the top hierarchy folder; otherwise, the hierarchy folders below will not be displayed.

When inserting pictures, bear in mind that you can insert only one picture per hierarchy folder.

CAUTION
Avoid any direct changes in the WinCC Picture Tree Manager, for example, do not insert additional hierarchy levels or containers, or rename pictures. The data visualized in Picture Tree Manager are derived from the configuration data of SIMATIC Manager. Subsequent changes can be overwritten when you recompile the OS, if you have selected the "Derive picture hierarchy from the plant hierarchy" check box.

Picture Tree Manager and user permissions

The hierarchy levels of the Picture Tree Manager are also available when you assign user permissions. You must make or change user permissions settings in the following cases:

- If you create new areas in the plant hierarchy of SIMATIC Manager or the Picture Tree Manager
- If you change the hierarchy in the plant hierarchy of SIMATIC Manager or the Picture Tree Manager

You must set new user permission for these new areas. Specify user permissions both on the OS server and on the OS client after importing server packages.

9.8.2 Calculating the Group Display Hierarchy

Calculating the Group Display Hierarchy

If you insert group displays into the 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	**Options > Recalculate entire group display hierarchy when saving**
You wish to update the group display hierarchy after changes,	**Options > Save Delta**

If no messages are displayed in the overview area in process mode, proceed as follows: Close the WinCC Explorer and reopen it.

On downloading or delta loading, the group display hierarchy is recalculated irrespective of the activated options.

Settings in the alarm system

10

10.1 Overview of the Alarm System

Introduction to the alarm system

The PCS 7 alarm system (alarm logging) is responsible for the following message processing functions in process mode:

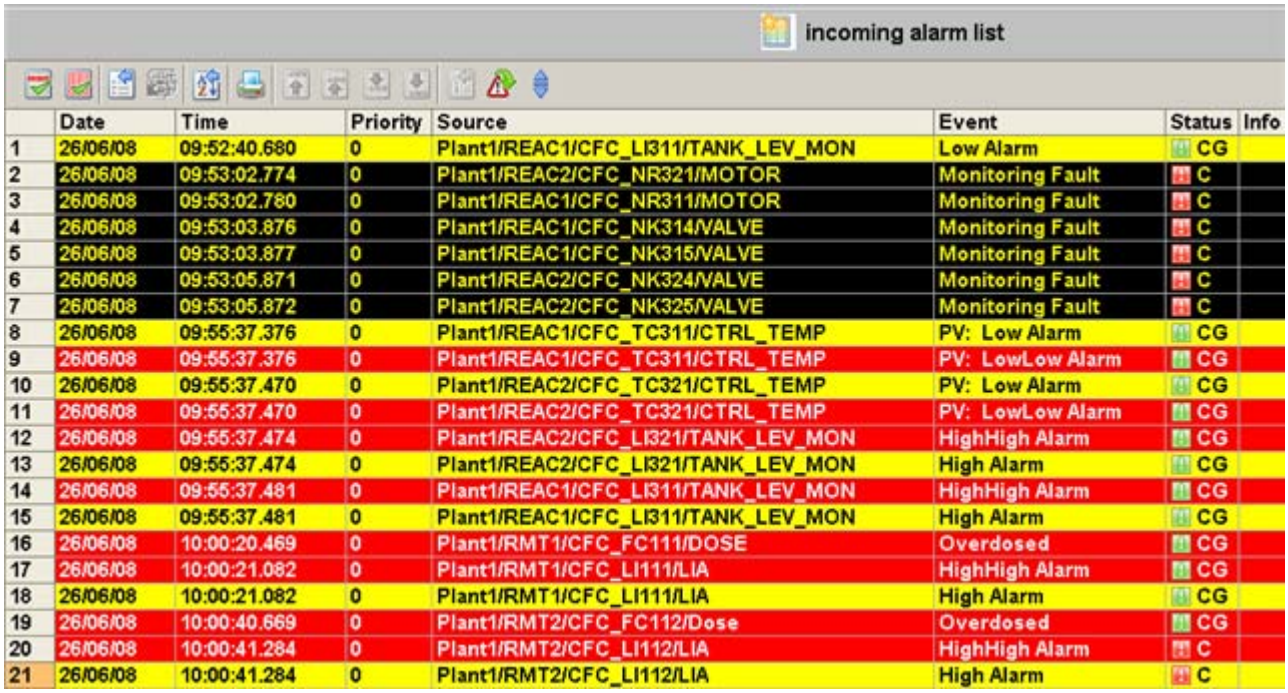
- Receiving messages from processes
- Processing messages and displaying them in message lists in process mode
- Acknowledgments by the operator
- Archiving

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 alarm 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 alarm 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 alarm list	Display of all unacknowledged event messages
Acknowledged alarm list	Display of all acknowledged event messages which are still pending in the process
Outgoing alarm list	Display of all the event messages which are marked as "gone" and have not been acknowledged.
Operation list	Display of all the operator input messages
Process alarm list	Display of all the process alarm messages, e.g. failure of a rack
History	Display of all event messages
Hidden List	Display of all event messages which are hidden manually by the operator or automatically
List of messages to hide	Display of all event messages which are hidden when they occur

Information units for a message

An individual message comprises different items of information. These individual items of information are characterized as message blocks which can be divided into three areas:

Message block	Description
System block	System blocks contain system data which is assigned by Alarm Logging. They include details such as date, time or identifier for logging. The contents of the system blocks are specified.
Process value block	Process value blocks contain values which 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 which help towards general information and understanding, e.g. explanations of event messages, error location or cause of the alarm. You can adapt the contents of user text blocks individually.

Configuration of the alarm system

Define the settings for the alarm system in WinCC Explorer in the following editors:

- in the OS project editor (Page 210)
- in the "Alarm Logging" editor (Page 212)
- in the Graphics Designer (Page 213) editor

Data which you have configured in the SIMATIC Manager is copied to the WinCC Explorer when the OS is compiled.

10.2 Settings in the OS project editor

10.2.1 Settings for the Alarm System in the OS Project Editor

Introduction

Basic settings for the alarm system are made automatically in the OS project editor of the SIMATIC Manager for representing the message system in the process control when an OS is created. Accept these default settings.

Settings for PCS 7 projects in the "Message Display" tab

The following settings should be set for PCS 7:

- Activate the "Acknowledgeable messages in separate list" check box to enable the plant operator in process mode to acknowledge only the messages of the OS areas where he is authorized.
- Activate the "Show button for hiding manually" check box to release the "Smart Alarm Hiding" function (manual hiding and showing of messages) for process control by operators.
  Enter the manual hiding period in the WinCC project of the OS Server.
- Activate 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.

Further information is available in the section "How to Make Alarm System Settings in the OS Project Editor (Page 211)".

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 messages"

You can make settings in the following groups of the "Message Configuration" tab:

Activate the "Complete configuration" check box 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 messages"

You can find additional information about the settings in the OS project editor in the "Message Configuration" tab in the *WinCC Information System* Online Help.

10.2.2 How to Make Alarm 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 **Open** command.
   The OS Project Editor opens.
3. Select the "Message display" tab.
4. Select, for example, the "Acknowledgeable messages in separate list" check box in the "Message filter" group.
5. Configure the following settings in the "Smart Alarm Hiding" group if using the "Smart Alarm Hiding (Page 228)" function, for example:
   - Activate the "Show button for manual hiding" check box. This activates the "Hide/show message" toolbar icon in the message lists of the process control system.
   - Enter the manual hiding period 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 *WinCC Information System* Online Help.

10.3 Settings in the Alarm Logging editor

10.3.1 Settings for the Alarm 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.

Additional information about configuring messages in SIMATIC Manager is available in the section "Message Configuration (Page 82)".

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 the SIMATIC Manager and transferred to the OS during the compiling of the OS.

Changing the default settings for the alarm system in the "Alarm Logging" editor

If you wish to make changes to the default settings, the "Alarm Logging" editor provides the following options:

- Layout settings of message blocks:
  At this instance you can add detailed definitions to the basic settings you made 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 in this dialog. The colors for the message classes are set.
- Group messages:
  Use this dialog to arrange the messages in groups.

Additional information

For additional information, refer to the Online Help for the *WinCC Information System*.

10.4 Settings for message lists

10.4.1 Message List Settings 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.

Sorting criteria in message lists

The message priorities you assigned in the ES to the block types and instances can be used as sorting criteria in the message lists.
Further information about defining message priorities is available 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
Outgoing alarm list	@AlarmGone.pdl
History list	@AlarmJournal.pdl
Incoming alarm list	@AlarmNew.pdl
Acknowledged alarm list	@AlarmOld.pdl
Operation list	@AlarmOperation.pdl
Process alarm list	@AlarmProcess.pdl
One-line message in overview area	@AlarmOneLine.pdl
Incoming alarm list, quitable	@AlarmNewOp.pdl
Outgoing alarm list, quitable	@AlarmGoneOp.pdl
Acknowledged alarm list, quitable	@AlarmOldOp.pdl
Hidden List	@AlarmHidden.pdl
List of messages to be hidden	@AlarmHiding.pdl
Highest priority messages	@AlarmEmergency.pdl

10.4.2 How to Define 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 Alarm Control" dialog box opens.
3. Open the "Message Lists" tab.
4. Click "Sort".
   The program opens the "Sort" dialog box.
5. Select "Sort by:" from the drop-down list: for example, the entry "Priority".

   Note

   The "Priority" entry is only displayed the message number range is assigned unambiguously to the CPU.

   If you want to specify other sort criteria, you can make additional selections.

6. Click "Ascending Order".
   The message of highest priority is visualized 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 **File > Save** command.
   The program saves the modified file.

10.5 Using and Configuring the Horn

10.5.1 Function of the Horn

Introduction

In addition to a visual representation of messages and alarms, certain messages might require an acoustic representation.

The "Horn" function

The OS offers the "Horn" function with the following options:

- You can connect a signal module to a PCI interface in the operator station.
  - You can control three optical or acoustical transducers using the signal module. Assign the tags to the signal generators in the WinCC "Horn" Editor of WinCC. Further information is available in the section "How to configure a signal horn". (Page 221)
  - The transducer is acknowledged/rest via software control or by an external acknowledgment at signal module.
  - A group signal at the signal module is also available. The group signal is triggered when one of the three transducers 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" (Page 217) editor.

Additional information

Additional information about the "Horn" function is available in the *WinCC Information System* Online Help.

10.5.2 Functioning of Signal Tags

Introduction

An incoming message activates a signal tag that triggers an acoustic or optical signal on the assigned transducer.

The "Horn (Page 217)" 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 permission 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.

10.5.3 Acknowledging Signals

Introduction

The horn can be acknowledged by the plant operator in process mode separately for a PC station or coordinated for several PC stations using the "Acknowledge Horn" horn acknowledgment button, without acknowledging the associated message. The horn is acknowledged with check of premissions.
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 transmitters 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

- Online Help for *WinCC Information System*

10.5.4 Settings in the 'Horn' Editor

Settings in the 'Horn' Editor

The "Horn" editor contains two tabs on which you can configure the horn:

- "Message assignment (Page 217)" tab: Assign message properties to a signal tag.
- "Signal assignment (Page 220)" tab: Assign the signal tag to a physical output of the signal module and/or a WAV file.

10.5.5 Settings in the "Message Assignment" Tab

Introduction

In the "Message Assignment" tab, you create the signal tags to be connected to the properties of messages, which serve as filters. You also define the access rights for the individual signal tags for which the signal tag are triggered.

On the "Message Assignment" tab you can enter settings in the following groups:

- Set tag
- Authorization check
- Define message properties as filter criterion for signal tags

Set tag

In the "Set tag" group: Specify the message status for which the signal tag is set and the horn is triggered.

Authorization check in the "Authorization check" group

In the "Authorization check" group: you can deactivate the default authorization check "Authorization for area". If you deactivate the default authorization check, only the configured trigger permission 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.

Define the authorization levels in the "User Administrator" editor of WinCC.
Further information on authorization levels is available in the *WinCC Information System* Online Help.

Authorization check in the "Authorization" column of the table

You can select a variety of permissions to activate the signal tags:

- Default
  check of the "Authorization for area" permission
- Any other authorization defined in the WinCC "User Administrator",
  validation of the defined authorization and of the "Authorization for area".

Message properties as filter criteria

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 box
Priority	Specify the desired message priority that should activate the tag. Enter a number from 0 to 16. Further information is available in the section "Message priorities (Page 89)".
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.
Tag	See section "Signal Tags"

Signal tags

The signal tags are WinCC internal tags, which control the physical outputs of the horn.

The program sets the status "1" at the associated signal tag when a message with matching priority is received.

The same signal tag can be controlled by different message properties.

Example entry

You can see an example of a minimal configuration for message assignments in the following table:

Message Class (Message Class)	Priority	Origin	Area	Event	Permission	Tag
Alarm					<default>	alarm_horn
Tolerance					<default>	tolerance_horn
Process control message					<default>	system_horn

Chatter messages

Chatter messages are messages which come and go constantly at short notice and are thus able to generate an unwelcome surge of messages. This is often due to chattering contact in the system.

In the "Set Tag" group, you can activate the "Not on receipt of an unacknowledged message" check box to suppress these chatter messages. When this radio button is selected, these messages are triggered only once. They can be retriggered only after acknowledgment.

Additional information

Online Help for *WinCC Information System*

10.5.6 Settings in the "Signal Assignment" Tab

Introduction

You configure the "Signal Assignment" tab in the WinCC project of the PC station (OS client, OS server), where the signal module and/or WAV file is triggered.

You can make settings in the following groups of the "Signal Assignment" tab:

- Horn acknowledgment characteristics
- Play sounds
- Tag, Signal Module, Sounds

Horn acknowledgment characteristics

Define the signal acknowledgment characteristics in this dialog.
Further information is available in the section "Acknowledging Signals (Page 216)".

Play sounds

This is where you specify the play characteristics of the sounds for a variety of pending messages.

Tag, signal module, sounds

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.

Example entry

Signal Tag (Tag)	Signal Module	Sound "(WAV File)"
horn_1	Output 1	alarm.wav
horn_2	Output 2	warning.wav
horn_3	Output 3	tolerance.wav

Further information

Online Help for *WinCC Information System*

10.5.7 How to Configure a Horn

Procedure

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.
3. Open the "Message Assignment" tab.
4. Double-click on the respective table cell to configure the message properties. One of the following configuration options is displayed depending on the cell selected:
   - A drop-down list for the table columns "Message class", "Area", "Authorization"
   - A selection list for the table columns "Origin" and "Tag"
   - An input box for the table columns "Priority" and "Events"

   Further information about programming message properties is available in the section Settings in the Message Assignment Tab (Page 217)".
5. In the "Set Tag" group, click "Not for arrival of an unacknowledged message" to suppress chatter messages.
6. Click "Apply".
   The program saves your entries in this tab.
7. Open the "Signal Assignment" tab.
8. Specify the horn acknowledgment :
   - If you wish to perform local acknowledgment, activate the "Local only" check box.
   - Activate the "Multiple acknowledgment in the following group:" check box to acknowledge a group of horns.
     Enter a name in the input box.
     Enter the same group name in all relevant PC stations' WinCC projects.
9. Specify the assignment of the signal tag to the signal modules and/or sound files:
   - "Tag":
     Right-click "Browse" to open the tag selection dialog box.
     Select a tag which is to trigger an acoustic or optical signal at the associated signal generator.
   - "Signal module":
     Select the desired output of the signal module from the drop-down list.
   - "Sound":
     Requirement: The soundcard is installed.
     Click the "Browse" button to open the tag selection dialog box.
     Select the required WAV file.
   - "Arrow buttons":
     Specify the order of the signal tags using the arrow buttons.
10. Click "OK".

Further information

- "Settings in the "Message Assignment" Tab (Page 217)" section
- "Settings in the "Signal Assignment" Tab (Page 220)" section
- Online Help for *WinCC Information System*

10.5.8 Example Configurations

Overview of example configurations

The following example shows you how horns can be used:

- OS client with signal generator (Page 223)
- OS client with multiple acknowledgment in a group (Page 224)
- OS server with signal generator (Page 225)

10.5.9 OS Client with Transducer

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 transducer.
- OS server has no transducer.

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. Always activate the "Local only" check box in the "Signal Assignment" tab.
3. Click "OK".

Behavior in the process control

The transducers of the individual OS clients are triggered by a message independent of one another. Each OS client acknowledges its transducer. Its own signal tag is reset and the signal is deactivated.

10.5.10 OS Clients with Multiple Acknowledgment in a Group

Introduction

The following example describes the configuration of two OS clients with a transducer in an OS multi-user system in a group.

Requirements

- Each OS client is in a separate room.
- Each OS client has a transducer.
- OS server has no transducer.

Prompt

The transducers 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. Activate the "Multiple acknowledgment in the following group" check box in each case in the "Signal Assignment" tab.
3. Enter the same group name each time in the input box, for example, "GROUP1".
4. Click "OK".

Behavior in the process control

The transducers of the individual OS clients are triggered by a message independent of one another. When the transducer is acknowledged on one OS client, the transducer 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 which triggers the transducer 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 transducer on OS client 2.

10.5.11 OS Server with Transducer

Introduction

The following example describes the configuration of OS servers with transducers in an OS multi-user system.

Requirements

- The OS server has a transducer.
- OS clients have no transducer.

Prompt

When an OS client receives a message, the message is displayed independent of the other OS clients. The transducer on the OS server is triggered. The transducer can be acknowledged on every OS.

Procedure

1. Configure the message assignment at each OS client using the WinCC "Horn" editor. Enter the signal tag with a server prefix as this tag also has to be created on the OS server.
2. Activate the "Multiple acknowledgment in the following group" check box in each case in the "Signal Assignment" tab.
3. Enter the same group name each time in the input box, for example, "GROUP1".
4. Click "OK".
5. Configure the signal assignment on the OS server in the WinCC "Horn" editor.
6. Enter the same group name each time in the input box, for example, "GROUP1".
7. Click "OK".

Behavior in the process control

The transducer of the OS server is triggered by the message on the OS client. Each OS client and OS server can acknowledge the transducer. 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 which triggers the transducer, 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 transducer on OS client 2.

10.6 Disabling and hiding messages

10.6.1 Disabling and Enabling Messages

Disabling and enabling messages for blocks and OS areas

Locking messages for individual interrupt-capable blocks and all interrupt-capable blocks in an OS area is used when the plant operator wants to lock all messages of an interrupt-capable block or all messages of all interrupt-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 configuration tasks have to be performed before you can disable and enable 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.

10.6.2 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
  Further information is available in the section "Hiding and showing messages in process mode manually (Page 228)".
- Automatic hiding and showing of messages in process mode
  Further information is available 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 "Hidden" list.
- Hidden active messages can be shown again in the incoming list, outgoing list and acknowledged list by enabling this function in the "Hidden List".
- Inactive hidden messages can be visualized by means of the "List of messages to hide".
- 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 on the process picture and faceplate group displays.
- The program generates an entry in the operator log to indicate that a message is hidden in the process control.
  The program responds likewise when a message is shown.

10.6.3 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
- Hidden List
- 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 visualized again within the active process 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:
  - "Hidden List"
  - "List of message to be hidden", and then clicking "Show/hide messages".

Further information

- Section "How to set up the alarm system in the OS Project Editor (Page 211)"
- *Process Control System PCS 7; OS Process Control* manual
- Manual *Process Control System PCS 7; Engineering System*

Configuring the archiving functions 11

11.1 Archiving in PCS 7

Introduction

In a PCS 7 system, you can archive various types of data that are produced in process mode. This data includes measured values and messages.

Archiving process values

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 the section "Defining Archive Tags (Page 80)".

Sequence of archiving

By default, archiving is performed locally on the various OS servers.

If you also use a central archive server, additional archiving routines are performed centrally on this central archive server.

The local archives of OS servers are configured as recirculating 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.

The OS server retries to swap the data at a later time if the CAS is briefly unavailable. This functionality is available without data loss as long as the recirculating archive contains data.

As an additional tool for archiving data from PCS 7, you can also use StoragePlus. This software package requires a separate license.

Additional information

You can find additional information about StoragePlus in the corresponding online help.

Simple and quick creation and processing of process value archives

You can conveniently create and manage process value archives using the WinCC Archive Configuration Tool.

You can find more information about this in the section "WinCC Archive Configuration Tool (Page 375)".

11.2 Editors for 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 System Archive. 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 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.

Further information

- is available in the section: "Additional Archives in the "Tag Logging" (Page 241) editor
- Online Help for *WinCC Information System*

11.3 Parameters for Archive Configuration

Configuring archives on an OS server

To understand the archives, the following terms are important:

- Segment: The individual 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 entire archive. You can find additional information about calculation in the section: "Calculation of storage space and the number of single segments (Page 240)"

Parameter	Meaning
Max. size	• Recommended size of a single segment: maximum of 700 MB • 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

In the case of non-redundant OS servers, please note:
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 on the central archive server

If you also use a central archive server for archiving, you need to make further settings for the additional archiving routines on the central archive server.

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 central archive server.

You can find a detailed description of the rules in the section "Rules for Archive Configuration (Page 250)".

Additional information

- Online Help for *WinCC Information System*

11.4 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 central archive server, 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.

Further information

For further information, refer to the Online Help for the *WinCC Information System*.

11.5 How to configure the archives in the "Tag Logging" editor

Requirement

The "Tag Logging" editor is open.

Procedure

1. Select the "Archive configuration" object from the tree view.
   The detail view returns the TagLogging Fast and TagLogging Slow archive types.

   Note

   Configure the two types of archives one after the other.

2. Select an archive type from the detail view, and then select the **Edit > Properties** command.
   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 central archive server, you don't have to make any entries in the "Backup configuration" tab.
   Check compliance with the following requirement and proceed to step 7.
   Requirement:
   The checkbox "Export to the central archive server" is enabled in the SIMATIC Manager in the "Properties - OS – [Name of OS]" dialog box.
   - For OS servers: in the "Target OS" tab
   - For redundant OS servers: in the "Target OS and Standby OS" tab.
6. If you don't use a central archive server and you wish to back up your archive data, configure as follows:
   - 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 will automatically be backed up in 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 are completed for your archive.

11.6 How to configure the message archive in the "Alarm Logging" editor

Requirement

The "Alarm Logging" editor is open.

Procedure

1. Select the "Archive configuration" object from the tree view.
   The detail view returns the "Message archive" type.
2. In the detailed window, select the "message archive" entry and then select the command **Edit > Properties** command.
   The "AlarmLogging" dialog box opens.
3. Perform steps 3 to 6 as described in the section "How to Configure the Archives in the "Tag Logging" editor (Page 236)".
4. Click "OK".
   The settings for the message archive are complete.

11.7 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 archive values on a central archive server without having to resort to archives in other locations, you must 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.: 64GB

Space required for OS protocols

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.

There is further information available in the *WinCC Information System* Online Help.

Space required for batch reports

For further information, refer to the SIMATIC BATCH Readme file.

You can open the Readme file after installing SIMATIC BATCH with the menu command **Start > SIMATIC > Product Notes > <Language*> > SIMATIC BATCH - Readme**.

* Select the required language for **<Language>**.

11.8 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:
  - Storage requirement [bytes/day] = x * 15 bytes/value * 86400 s
    where:
    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 = Storage 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:
  - Storage requirement [bytes/day] = y * 32 bytes/value * 86400 s
    where:
    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 = Storage 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:
  - Storage requirement [bytes/day] = z * 4096 bytes/value * 86400 s
    where:
    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 = Storage requirement [bytes/day] / configured max. size of a single segment

11.9 Configuring additional archives in Tag Logging

11.9.1 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 central archive server, 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*
- Manual *Process Control System PCS 7; Engineering System*

11.9.2 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 Tasks

Creating additional archives involves the following:

Step	What?
1	Specifying a new archive (Page 242)
2	Specifying the archive properties (Page 243)
3	Specifying the tag properties (Page 244)

11.9.3 How to Define a New Archive

Procedure

1. In the WinCC Explorer tree view, select the "Tag Logging" editor.
2. Select the **Open** command from the shortcut menu.
   The "Tag Logging" editor opens.
3. In the tree view, select "Archives".
4. Select the **Archive Wizard** command from the shortcut menu.
   The "Create Archive" wizard opens.
5. On the start page of the wizard, click "Next".
6. In step 1, make the following entries:
   - Enter the name of the archive in the "Archive Name" box.
   - Select the radio button for the required archive type.
7. Click "Continue".
8. Click "Select…" in step 2.
   The tag selection dialog box opens.
9. Select the tag.
   You can select a group of tags using the group selection function of the <Ctrl> key.
10. Click "OK".
    The tag selection dialog box closes and all selected tags are entered in the field.
11. If you want to insert additional tags, click "Select" again and select the additional tags.
12. Click "Apply" after you selected all tags.
    The program generates the archive and outputs it to the detail view. All selected tags are displayed in the table.
13. Create additional archives as necessary. To do so, repeat steps 2 through 10.

11.9.4 How to Define Properties of an Archive

Requirements

- The "Tag Logging" editor is open.
- An archive has been created with the required tags.

Procedure

1. Select the relevant archive from the detail view. To define its properties, select the **Edit > Properties** command.
   - If you have selected a process value archive, the "Process Value Archive Properties" dialog box opens.
   - If you have selected a compressed archive, the "Compressed Archive Properties" dialog box opens.
2. Define the archive parameters.
   Further information is available in the WinCC Information System Online Help.
3. Select the "Memory Location" tab and define the memory location.
4. Click "OK".
   The dialog box closes and the "Tag Logging" editor appears.
5. Select the **File > Save** command.
   The program saves the archive settings.
6. Define the properties of any other archives you created. To do so, repeat steps 1 through 5.
7. Select the menu command **File > Exit**.

11.9.5 How to Specify the Tag Properties

Introduction

You define 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 the SIMATIC Manager.
2. Select the "Measured value archive" tab.
   The program updates the measured value archives and visualizes these in tabular format. You can edit all fields with a white background.
3. In the "Filter by column" list, select "Archive name".
4. In the "Display" box, enter the name of the archive for which you want to define the tag properties.
   The program updates the display according to the filter settings.
5. Set the following properties:
   - Tag comment
   - Long-term archiving
   - Tag supply
   - Archiving
   - Acquisition cycle
   - Archiving cycle factor
   - Archiving/display cycle
   - Save on error

Additional information

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

11.10 Use of a central archive server

11.10.1 Plant Configuration with Central Archive Server

Central archive server

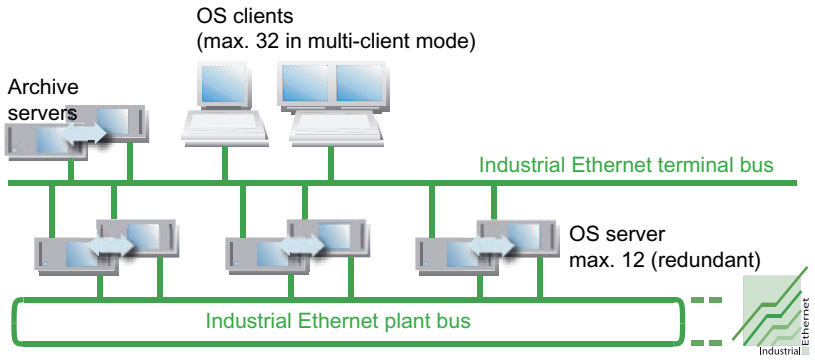
PCS 7 allows you to use a central archive server for long-term archiving. The central archive server can only be used for the central archiving of measured values, messages and logs.

There is only one central archive server within a multiproject. The central archive server is a node on the terminal bus and is not connected to the plant bus.

When a central archive server is used, data communication is needed between the central archive server and the OS servers whose data should be archived.

The central archive server can be installed in a redundant system in order to enhance availability.
Further information is available in the *Process Control System PCS 7; Fault-tolerant Process Control Systems* manual.

The following figure shows a plant configuration with a central archive server:



Using a central archive server

You can archive the following using a central archive server:

- Messages (Alarm Logging)
- Archive values (Tag Logging)
- OS reports (output as an EMF file)
- Batch logs of SIMATIC BATCH (output as PDF or XML file)

Exporting archives to external media

Segments can be exported to external media, e.g. CD, DVD.

For performance reasons, no backup devices may be used to archive data on PC stations in process mode.
We recommend that you only use backup devices to archive data (e.g. CD/DVD burners) on the engineering station.
The engineering station bundle includes CD/DVD burner software. This software can be installed afterwards.

Importing archives from external media

The data which is exported to external media can be read again on the central archive server on which it was exported.

Display of the archived data

- OS clients can display the following information from the central archive server:
  - Process values which are saved in the archives in the form of graphs or tables
  - the messages which are saved in the archives
- You can view OS reports and batch logs directly on the central archive server using the Storage Plus web viewer.

Central archive server's response to failure

- Failure of a non-redundant central archive server:

  In the event of a central archive server failure, the individual segments are archived further on the OS servers. Since the archive on the OS servers is designed as a recirculating archive, the data in the recirculating archive which have not yet been exported are copied from the OS servers to the central archive server following activation of the archive server.

NOTICE
If the central archive server fails for a longer period than the period of the recirculating archive, the data on the OS servers will be overwritten. The data can no longer be copied to the central archive server.

- Failure of a redundant central archive server:
  - 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

    Behavior is as described in the section "Failure of a non-redundant central archive server".

Installation and licensing

The central archive server is installed with the PCS 7 framework setup. The central archive server requires an additional license.
You can find information about the installation and the licenses in the *Process Control System PCS 7; PC Configuration and Authorization* manual.

Further information

- You can find further information about the server data in the section "Creating and Downloading Server Data (Page 347)".
- Manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*

11.10.2 Archiving of messages and archive values

Requirements

- The OS server and the central archive server are located in the same 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 entire archiving process for messages and archive values (configured in the "Alarm Logging" and "Tag Logging" WinCC editors) consists of the following:

- The process data are first stored locally in single segments on the OS servers. You set the parameters (for example, size and time period for the single segments and the entire archive) in the archive properties in the "Tag Logging" and "Alarm Logging" WinCC editors.
- When a single segment is full in the Tag Logging or Alarm Logging on the OS server, it is copied to the central archive server.
- Single segments of the OS servers are grouped in new single segments on the CAS (Central Archive Server), depending on the "size" and "archiving period" parameters. The single segments of the CAS are saved to a recirculating archive.
  When the data volume in the recirculating archive has reached one of the limits defined in the "size" and "archiving period" parameters, the program deletes the "oldest" single segment from the CAS. By configuring "CAS - Central archive server options" (backup configuration), you can arrange for single segments to be transferred to external data media or to another computer on the network automatically.

11.10.3 Archiving of OS reports

Introduction

The transfer of OS reports is controlled via a C script.

Requirements

- The OS reports are created on the OS server using the WinCC "Report" editor.
- Under the printer settings, EMF file format has been selected for outputting OS reports.

Transfer via C script

Transfer of the OS reports is controlled on the OS server by means of a C script. The C script is created by the user. The C script can be called cyclically and then cyclically checks if the report has been sent to the PRT_OUT folder of the project. The available EMF files are transferred to the central archive server and then deleted from the OS project.

Application	Where?	Template called via
Transfer of OS reports	Global Script" editor	Object "Standard functions" > Split Screen Manager > StoragePlus_ExportReports
Transfer of OS reports for redundant central archive servers	Global Script" editor	Object "Standard functions" > Split Screen Manager > StoragePlus_ExportReportsEx

11.10.4 Archiving of batch logs

Archiving of batch logs

Batch logs are transferred manually.

Further information

You can find further information about this in the section "How to archive batch logs (Page 256)".

11.10.5 Archiving on a redundant central archive server

Archiving process on a redundant archive server

If the plant configuration includes a redundant central archive server, the data will be archived in parallel.

11.10.6 Rules for Archive Configuration

Archive capacity requirements

The issue of how long the data are stored on the central archive server depends on the archive size, the amount of data and how often data are stored.

Further information on the determination of storage space is available in the section "Determining the Archive Storage Requirements (Page 238)".

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 central archive server.

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 central archive server:
  - 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 for 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 for a single segment" parameter
- The hard disk capacity determines the overall period and size of the segments.
  That is, more free hard disk space increases data storage capacity.
- When selecting the starting point for transferring single segments (e.g., in the case of daily transfer), try to select one that does not coincide with times when the OS server is subject to an increased data load such as when the OS is accessing trend data.

Central archive server rules:

- Set the time period for the single segments on the central archive server substantially longer than the time period for single segments on the OS servers:
- Set the size for the single segments on the central archive server substantially larger than the size for single segments on the OS server.
  We recommend a maximum size for a single segment of 1 GB.
- Do not set too many single segments for the central archive server.
  We recommend a maximum of 200 single segments.

Further information

You can find additional information about calculating the size of a single segment and calculating the maximum number of single segments in the section "Calculation of storage space and the number of single segments (Page 240)".

11.10.7 Overview of central archive server configuration

Overview of the Steps in Configuration

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

Tags with the Long-term archiving property are archived on the central archive server. You can find further information about this in the section "Archive tags (Page 80)".

What?	Where?
Setting up the PC stations (network adapters) for the ES	SIMATIC Shell, "Configure PC Station" configuration console
Inserting the central archive server into a project as a PC station	SIMATIC Manager
At a CAS: Insert the WinCC CAS application and hardware components that belong to the central archive server	HW Config
Setting the central archive server properties: • Naming the central archive server • Specifying the target OS (path to target computer) for the central archive server	SIMATIC Manager
Specifying the archive properties • Archive size and segments • Time point of the first segment switch	SIMATIC Manager
Setting the backup configuration	SIMATIC Manager
Activating or deactivating process control messages and operating messages	WinCC-Explorer > OS Project Editor
Enable the "Export to a central archive server" option on the OS servers from which data is to be exported to the central archive server.	SIMATIC Manager
Download the project to the central archive server	SIMATIC Manager
Enable the project on the central archive server	Central archive server

Further information

- Manual *Process Control System PCS 7; Engineering System*
- Manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*
- Manual *Process Control System PCS 7; PC Configuration and Authorization*

11.10.8 Configuring a redundant central archive server

You can install a redundant concentrator (central archive server) in order to enhance availability. Further information relating to the configuration of a redundant central archive server is available in the *Process Control System PCS 7; Fault-Tolerant Process Control Systems* manual.

11.10.9 How to Create and Configure a Central Archive Server

Requirement

- The OS servers have been compiled.

Procedure

1. In the SIMATIC Manager component view, select the project that is to have the central archive server inserted.
2. Select the **Insert > Station > SIMATIC PC Station** command. A new SIMATIC PC station is inserted into the selected project.
3. Select the SIMATIC PC station.
4. Select the menu command **Edit > Object Properties**.
5. Go to the "Name:" input field to enter a name.
6. Enter the Windows name of the station in the "Computer name" input box.
7. Click "OK".
8. 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.
9. If the hardware catalog is not visible, select the **View > Catalog** command to open the hardware catalog.
10. Drag-and-drop the WinCC application "WinCC CAS Appl." from the "SIMATIC PC Station > HMI..." folder of the hardware catalog to the configuration table.
11. Select **Station > Save and Compile** from the menu.
12. Close HW Config and change to SIMATIC Manager.

Additional information

Information relating to the installation of a redundant central archive server is available in the *Process Control System PCS 7; Fault-Tolerant Process Control Systems* manual.

11.10.10 How to set the central archive server properties

Procedure

1. In SIMATIC Manager, open the component view.
2. In the tree view, select the "[OS]" object underneath the central archive server's SIMATIC PC station.
3. Select the **Edit > Object properties** command.
   The "Properties – OS:[OS Name]" dialog box opens.
4. Select the "Target OS" tab and enter the target path for the central archive server.
5. Click "Apply".
6. Select the "CAS – Central archive server options" tab.
7. Select the relevant radio button in accordance with your archiving requirements:
   - All
   - TagLogging Fast
   - TagLogging Slow
   - AlarmLogging
   - Reports (OS reports and batch logs from SIMATIC BATCH)
8. Make the following settings in the "Archive size" group:
   - Enter the entire period of time shown for the length of the CAS cyclic buffer in the "Time for all segments" input box.
   - In the "Max. size for all segments" input box, enter the maximum time period for all segments combined. This imposes a limit in terms of the memory requirements.

     These settings will depend on the maximum amount of storage space that is available for your archives.
   - Enter the period of time a single segment is to be archived for in the "Time for a single segment" input box.
   - In the "Max. size of a single segment" input box, enter the maximum size for a single segment.

     Depending on which parameter is satisfied first, the single segment is closed and a new single segment created.
9. Specify the "Time of first segment change".
10. Click "OK".

Additional information

Information relating to the installation of a redundant central archive server is available in the *Process Control System PCS 7; Fault-Tolerant Process Control Systems* manual.

11.10.11 How to set the backup configuration for the central archive server

Introduction

You can back up the archives from the central archive server by means of the backup configuration option.

Procedure

1. In SIMATIC Manager, open the component view.
2. In the tree view, select the "[OS]" object underneath the archive server's SIMATIC PC station.
3. Select the **Edit > Object properties** command.
   The "Properties – OS:[OS Name]" dialog box opens.
4. Select the "CAS – Central archive server options" tab.
5. Define the following setting in the "Backup configuration" group:
   - Select "Only long-term data", if you only want to save the tags in the central archive server that have been assigned the "Long-term archiving" attribute.
     - Process object view > "Archive tags" tab > "Long-term archiving" column
     - CFC > Block properties > "Connections" tab.
   - Select "Activate signature" if you want to make use of the signature function.
   - Set the "Backup activated" checkbox to enable external backup of archive data. Enter the target path and an alternative path to the storage location in the "Backup configuration" group.
   - Select "Backup on both paths", if you want the alternative path to receive a backup when the destination path cannot be accessed.
6. Click "OK".

11.10.12 How to configure the OS project editor for the central archive server

The process control messages and operating messages from the system for the central archive server are available in the OS Project Editor for use within the context of archiving.

Procedure

1. In the WinCC Explorer tree view, select the OS Project Editor.
2. Activate the "Complete configuration (loss of support for online delta loading capability)" checkbox in the "General" tab following the same procedure as with an OS.
3. In the WinCC Explorer tree view, select the "Computer" object.
4. Select the menu command **Edit > Properties**.
   The "Computer List Properties" dialog box opens.
5. Click "Properties".
   The "Computer properties" dialog box opens.
6. Select the "Startup" tab.
7. Clear the "Graphics Runtime" check box.
8. Click "OK".
   The "Computer properties" dialog box closes.
9. Click "OK".
   The "Computer list properties" dialog box closes.

Further information

Section "Working with the OS Project Editor (Page 110)"

11.10.13 How to Restore Swapped-out Archive Data

Accessing data on external media

To access data you have already transferred to external storage media, you connect the archive data again locally to the database of the central archive server. You can do this, for example, with the administration console of the StoragePlus add-on package. The process data can be displayed there via normal database access actions, or the segments can be copied to the Common Archiving folder.

Note

If archive data exported to a redundant central archive server are imported to a partner server, these archive data are only available on the partner server to which the archive data were imported.

11.10.14 How to archive batch logs

Procedure

1. In SIMATIC BATCH Control Center, select the menu command **Options > Settings > Project settings (F8)**.
2. Go to the "Archive" tab and select the required technology in the "Technology" area.
3. If necessary, enter the user-specific login data in the "User details" area.
4. Click "Test" to check your settings.

Additional information

You can find additional information about this dialog box in the Online Help for *for this dialog box*.

11.10.15 Displaying process data on the OS client

Messages and process values

You can display messages and process values stored in the archives of the central archive server on the OS client.

Note

To display messages and process values on the OS clients, download the server data from the central archive server onto the OS clients.

You can find further information about downloading server data in the section "Creating and Downloading Server Data (Page 347)".

11.10.16 Displaying Process Data with the StoragePlus WebViewer

Introduction

You can display messages, process values and reports on the central archive server with the "StoragePlus WebViewer".

StoragePlus WebViewer

In the StoragePlus WebViewer, you define views for the databases of the central archive server. The data are published over the Internet Information Server and can then be viewed via Intranet. The StoragePlus WebViewer is automatically installed with the central archive server.

Opening the StoragePlus WebViewer

Open the StoragePlus WebViewer by selecting the **Start > SIMATIC > StoragePlus > StoragePlus WebViewer** command in Windows.

Additional information

You can find additional information about working with the StoragePlus WebViewer and the StoragePlus software package in the Online Help for the *StoragePlus information system*.

11.10.17 New installation of the central archive server

Display of existing archive data

To display existing archive data on the operator stations, copy the following configuration data from the original configuration:

- Name of the database
- Archiving path of the database
- Archiving path of the logs
- Path of the enable directory

11.11 Using the Report Designer

11.11.1 Overview of Reports with the Report Designer

Reports with the Report Designer

The Report Designer provides functions for creating and outputting reports. The Report Designer also provides several standard layouts. These standard layouts have an "@" sign in front of the name. You can customize the standard layouts and create new ones to fit your needs. The Report Designer provides the required editors.

OS reports are created in SIMATIC Manager in exactly the same way as for process pictures.

NOTICE
Always save your customized layouts under a new name.

11.11.2 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: any messages generated are 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 which message blocks from Alarm Logging should be printed.

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 linked to associated applications. 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 with the Graphics Designer: The object pallet contains static and dynamic objects which you insert into the layout. You link the dynamic objects to 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*.

11.11.3 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 wish to record. Once the line layout has been linked 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 command button configured for this purpose
- Output whenever a process tag is modified

Additional information

For additional information, refer to the Online Help for the *WinCC Information System*.

11.12 Archive values in process pictures

11.12.1 Overview of Displaying 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:

- Online Trend Control: Visualization of process values as a function of time
- Function Trend Control: Represents the correlation of two process values.

11.12.2 Trend Display and Trend Display Configuration in Process Mode

Trend display and trend display configuration

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.

Further information

You can find information about the trend display in process mode in the *Process Control System PCS 7; OS Process Control* manual.

11.13 Working with the Online Trend Control

11.13.1 Function of the Online Trend Control

Online Trend Control

In the Graphics Designer, you can use the dynamic "Online Trend Control" 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 Online Trend Control

The trend diagram is displayed as follows:

- The x-axis is automatically the time axis.
- The y-axis represents the values.
  You can visualize a common y-axis for all trends, or a separate y-axis for each trend.

11.13.2 Tag connection in Online Trend Control

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 Online Trend Control 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 Online Trend Control.

11.13.3 Configuration steps for the Online Trend Control

Overview of the configuration steps

Configuring the Online Trend Control involves the following:

Step	What?
1	Inserting an Online Trend Control in the Graphics Designer (Page 263)
2 (optional)	Properties of a tag are applied automatically. (Page 264)

11.13.4 How to insert an Online Trend Control

Procedure

1. Open the desired picture in the Graphics Designer.
2. If the "Object palette" toolbar is hidden select the command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Enable the "Objects" checkbox.
4. Click "OK".
   The object palette is opened.
5. In the toolbar, select the "Controls" tab.
6. Open the "ActiveX Controls" folder.
7. Select the "WinCC Online Trend Control".
8. Move the mouse pointer to the drawing area.
   The mouse pointer is transformed into a small control cursor.
9. Hold down the mouse button and draw a rectangle matching the size of your trend display.
   The "Properties of WinCC OnlineTrendControl" dialog box opens.
10. Set the WinCC OnlineTrend Control properties.
    Information about the individual input boxes and check boxes is available in the *WinCC Information System* Online Help.
11. Click "OK".
    The "Properties of WinCC OnlineTrendControl" dialog box closes.

11.13.5 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 are automatically copied from the corresponding PCS 7 block:

- a minimum value
- a maximum value
- the unit

Requirements

- The attribute "S7_trend" is assigned on the basis of the block type for the block connection which represents the tag.
  Further information is available in the *Process Control System PCS 7; Engineering System* manual.
- The connection names of the block connections representing the minimum and maximum values for the range of values of the tag are entered in the "Value" column for the attribute "S7_trend". The connection names are separated by commas.
- The unit is assigned to the block connection of the block instance.
  Further information is available in the *Process Control System PCS 7; Engineering System* manual.
- The OS is compiled.

Procedure

1. Perform the steps described in the section "How to insert an Online Trend Control (Page 263)".

Result

The following fields are configured automatically in the "Value Axes" tab.

- The "Label:" input field,
  which contains the unit of measurement.
- The "Automatic" check box.
  This check box is enabled.
- The entry fields "from:" and "to:"
  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.

Changing the contents of the "From:", "To:" and "Label" fields manually

If you wish to change the fields, clear the "Automatic" check box.

11.14 Working with the Function Trend Control

11.14.1 Function of the Function Trend Control f(x)

Function Trend Control

You can use the Function Trend Control to visualize two different process values. You can visualize these process values on the x and y coordinates and then map these, for example, to a "Pressure versus Temperature" trend. When you select process values to be represented on the x and y axes, it is important that the process values are measured at approximately the same time.

The function trend control can display at least eight different trends with a maximum of 10,000 value pairs.

Boundary conditions

You can only display cyclic-continuous tags in the Function Trend Control. 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.

Actual and ideal trend

You can configure an associated ideal trend for each trend displayed in the Function Trend Control. An ideal trend is a static curve representing the ideal characteristic of process values so that the user can quickly compare the actual values to the ideal values. Like the actual trend, the ideal trend displays a tag on the x-axis and a tag on the y-axis. Both tags must come from the same user archive.

Trend values are provided from the following archives:

Trend with Actual Values	Trend with Ideal Values
• User archive • Process value archive • Online tags	User archive

11.14.2 Tag connection in the Function Trend Control

Tag connection in the Function Trend Control

The properties of the Function Trend Control 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
User archive	Values from a user archive. These values can also be displayed in runtime. This requires you to first create the necessary user archives with the "User Archives" editor.

Note

The same types of tags must be used for the x and y-axes on a trend.

Note

You will need a license in order to use the "User Archive" editor.

11.14.3 Configuration steps for the Function Trend Control

Overview of the Steps in Configuration

Configuring the Function Trend Control involves the following:

Step	What?
1	Configuring the ideal trend (Page 267)
2	Inserting a Function Trend Control in the Graphics Designer (Page 268)

11.14.4 How to Configure an Ideal Trend

Introduction

If you wish to display an ideal trend for the Function Trend Control, you must first configure it. The values for an ideal trend are stored in a user archive.

You can import values for ideal trends from WinCC tags or AS tags.

Procedure

To import values for ideal trends from WinCC tags, proceed as follows:

1. In WinCC Explorer, open the "User Archives" editor.
2. Create a new user archive.
3. Enter a descriptive name.
   Use the online help of the dialog box to complete your configuration.
4. Define the following two fields:
   - Setpoint for the x-axis
   - Setpoint for the y-axis
5. Select the **Edit > Runtime Data** command.
   This activates the table field.
6. Enter the setpoints.
7. Save the user archive.

Further information

For additional information, refer to the "Options" section of the *WinCC Information System* Online Help.

11.14.5 How to insert a Function Trend Control

Procedure

1. Open the required picture in the Graphics Designer.
2. If the "Object Palette" toolbar is not visible, select the menu command **View > Toolbars**.
   The "Toolbars" dialog box opens.
3. Activate the "Objects" check box.
   The object pallet opens.
4. In the object palette, select the "Controls" tab.
5. Open the "ActiveX Controls" folder.
6. Select the "WinCC FunctionTrendControl".
7. Move the mouse pointer to the drawing area.
   The mouse pointer is transformed into a small control cursor.
8. Hold down the mouse button and draw a rectangle matching the size of your trend display.
   The "Properties of WinCC FunctionTrendControl" dialog box opens.
9. Set the WinCC Function Trend Control properties.
   Information about the individual input boxes and check boxes is available in the *WinCC Information System* Online Help.
10. Click "OK".
    The "Properties of WinCC Function Trend Control" dialog box closes.

12 Time-of-Day Synchronization

12.1 Setting the TOD Synchronization

12.1.1 Overview of Time Synchronization

Time-of-Day 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.

Process control messages show the start and failure of the "time master role".

Time master and time slave

You must configure the time-of-day synchronization for each operator station to ensure time-of-day synchronization.

In time-of-day synchronization, a distinction is made between the time-of-day master and time slave:

- Time-of-day master
  OS servers and SICLOCK are usually configured as time-of-day masters. A time master at the OS servers may be assigned an "active time master" and "passive time master" function: The active time master outputs the TOD message frames to the time slaves and to the passive time masters. If the active time-of-day master fails, a passive time-of-day master can function as an active time-of-day master at any time.
- Time slave
  OS clients and automation systems are configured as time slaves. The time slaves receive the time message frames and use them to set their internal clocks.

12.1.2 Time synchronization with alternative time masters

Introduction

You can perform time-of-day synchronization with multiple OS servers on a common plant bus. The automation systems must be configured for operation as time slaves.
All OS servers can be configured for operation as time master.

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. This server therefore takes over operation as active time master.
If this server fails a different OS server which is configured accordingly assumes the time master function.
An OS server which features an external time generator (DCF77/GPS) enforces the time master function.

The OS server (stby) cannot be the active time master for a redundant OS server.

You can also perform the time-of-day synchronization on a redundant plant bus.

Further information

- *Process Control System PCS 7; Fault-tolerant Process Control Systems* manual.

12.1.3 Operating with Local Standard Time and Coordinated Universal Time (UTC)

Introduction

In PCS 7, UTC is used internally as a rule within the system. Time information displayed to the operator in process mode can be converted from UTC to the respective local time.

This makes it possible to configure a system, for example, with the automation system in a different time zone than the operator station. If necessary, the plant operator can also switch back and forth between coordinated universal time display and local time display in runtime.

Mixed operation

Combined operation is not supported; in other words, all automation systems within a plant operate either with local time standard time (WinCC V5 compatibility mode) or UTC. For a plant configuration extending over several time zones, UTC is mandatory.

12.1.4 How to Set the Time System

Procedure

1. Select the "Archive configuration" object from the tree view.
   The detail view returns the "Message archive" type.
2. Select the "[Computer name]" object from the detail view, and then select the **Edit > Properties** command.
   The "Computer properties" dialog opens with active "General" tab.
3. Select the "Parameters" tab.
4. Activate "The PLC is set to coordinated universal time (UTC)" check box (default setting) in the "PLC clock setting" group.
5. In the "Time basis for time display during runtime" group, select the required time mode from the drop-down list box. The time zone is only important for display in process mode. Only UTC is used internally, in archives, for example.
   The following options are available for setting the time mode:
   - Select "Server time zone (migrated projects)" for the "Time for migrated projects" mode.
   - Select "Local time zone" for the "Local winter time" mode.
   - Select "Coordinated world time (UTC)" for the "UTC" mode.
6. In the "Central date and time format" group, select the required format. This format setting will affect how the date and time are displayed within the context of process control.
   The following options are available for setting the date/time mode:
   - Select "Configuration on the Components" (default) for the "Configured format".
   - Select "Force ISO8601 format on all components" for the "Format according to ISO8601".
7. Click "OK".

12.1.5 Time Synchronization with External Clocks

External clock

The following clocks are used for time synchronization with an external 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 clock (DCF77RS or GPSDEC) for high-precision time synchronization.

You can find additional information about the external clock in the *SICLOCK TM* Operating Instructions.

12.1.6 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. 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. Activate the "Use time reception service" check box.
5. Select the "Synchronization via system bus (master, slave)" check box.
6. Select the CP from the "Access point 1" drop-down list box.
   This drop-down list box displays all CPs that are available in the OS server. Select the CP for which you have activated time-of-day synchronization in the configuration console.
7. Click "Master".
8. When you use a redundant CP, select the required CP for the "Access point 2".
9. Click "Master".
10. Click "OK".

12.1.7 Time Synchronization via 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 "Accept time from 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 time from specific computers" option is important when setting the time synchronization of OS clients within a domain: The station names you enter in this dialog correspond with the names of the domain controllers on the Windows network.
  The domain controller sets the OS server time by default.
- The "Let time be set by external (third party) components" option is not applicable in the PCS 7 environment.

12.1.8 Time Synchronization via Plant Bus

Introduction

OS servers and automation systems are connected to the plant bus.

Requirements

Time synchronization via the plant bus requires one of the following interfaces:

- Communications processor CP 1613 or CP 1623
- Network adapter in combination with Industrial Ethernet (BCE) software

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 plant 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.

12.1.9 Time Synchronization in the Workgroup

Introduction

You can synchronize the OS servers and automation systems in a workgroup via an external clock.

Behavior of the OS servers

All OS servers become passive time masters. They are synchronized by the SICLOCK via the plant bus. If the SICLOCK central system clock fails, an OS server assumes the function of active time master.

The OS server (stby) cannot be the active time master for a redundant OS server.

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.

12.1.10 How to Make the Settings for the Workgroup

Requirements

Time-of-day synchronization via the plant bus requires one of the following interfaces:

- Communications processor CP 1613 or CP 1623
- Network adapter in combination with Industrial Ethernet (BCE) software

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. 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 system bus (master, slave)" check box.
5. Select the CP from the "Access point 1" drop-down list box.
   This drop-down list box displays all CPs that are available in the OS server. Select the CP for which you have activated time-of-day synchronization in the configuration console.
6. Click "Master".
7. When you use a redundant CP, select the required CP for the "Access point 2".
8. Click "Master".
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. 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. Activate the "Synchronization via the terminal bus (slave)" check box.
   This activates all associated check boxes and input boxes.
5. Click "Use the time from a connected WinCC server".
6. Click "OK".

12.1.11 Time Synchronization in a Domain

Requirement

All operator stations are installed in a domain.

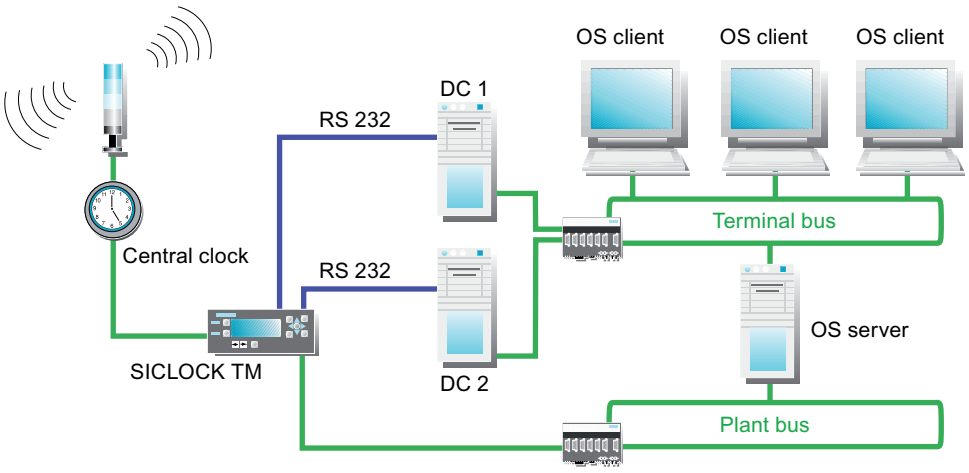
Rules

NOTICE
Before you set the time-of-day synchronization parameters for a PCS 7 system in a Windows domain, create a detailed plan of your network structure. This plan must contain all the relevant information for time-of-day 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 of day from? • Which computers are time masters and which are time slaves?

Time-of-day synchronization of all components of a PCS 7 system in a domain

If you want to time synchronize all components in a PCS 7 system, you synchronize the plant bus and domain controllers DC1 and DC2 via a central plant clock, i.e. SICLOCK. The domain controllers synchronize the terminal bus.

The following figure shows a theoretical system configuration:



Time-of-day synchronization of the OS servers via the terminal bus

The domain controller is synchronized by a high-precision central system clock.
The OS servers are synchronized by the domain controller via the terminal bus. They act as passive time-of-day masters on the plant bus and, in this configuration, cannot be synchronized via the plant bus.

Should the central system clock fail, one of the OS servers becomes the active time-of-day master on the plant bus.

Time-of-day synchronization of the OS client via the terminal bus

The OS clients are assigned their time from one of the connected OS servers.

Further information

- *Process Control System PCS 7; Time-of-Day Synchronization* manual

12.1.12 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. Activate the "Synchronization via the terminal bus (slave)" check box.
   This activates all associated check boxes and input boxes.
5. Click "Use the time from a specific computer".
6. In the "Computer 1" input field, enter the first domain controller (DC1) and in the "Computer 2" input field, enter the second domain controller (DC2).
7. Activate the "Synchronization via plant bus (master, slave)" check box.
   This activates all associated check boxes and drop down list boxes.
8. In the "Access point 1" list, select the required CP.
9. Activate the check box "Master" (default setting).
10. When you use a redundant CP, select the required CP for the "Access point 2".
11. Activate the check box "Master" (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. Activate the "Synchronization via the terminal bus (slave)" check box.
   This activates all associated check boxes and input boxes.
5. Activate the check box "Use the time from a connected WinCC server".
6. Click "OK".

Further information

- *Process Control System PCS 7; Time-of-Day Synchronization* manual

13 Sign-of-life monitoring

13.1 Configuring lifebeat monitoring

13.1.1 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.

Further information: SIEMENS portal process automation (https://pcs.khe.siemens.com/)

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. Requirements: 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.

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 under "Lifebeat Monitoring" in the *WinCC Information System* Online Help.

13.1.2 Display of Lifebeat Monitoring in Process Mode

Cycle for lifebeat monitoring in process mode

Lifebeat monitoring is automatically activated when the OS starts up and monitors the OS in cycles of between 5 seconds and 1 minute.

Display of error message

An error message appears as follows:

- A process control message is generated automatically if lifebeat monitoring detects a component failure.
- 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 being "scored through". In addition, the picture contains supplemental information in text form, such as "faulty," "server failed," or "server connected".

The elimination of a problem is also indicated by a process control message.

13.1.3 How to Configure 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 wish to monitor.
  Further information is available in the *WinCC Information System* online help.

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 list box:
   Select, for example, the entry "AS-4xx" if you are using a CPU 4xx or the entry "OS" if you wish 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 list 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 which the operator can view 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

14

14.1 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:

- In the plant hierarchy, map a system on one OS server only. 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

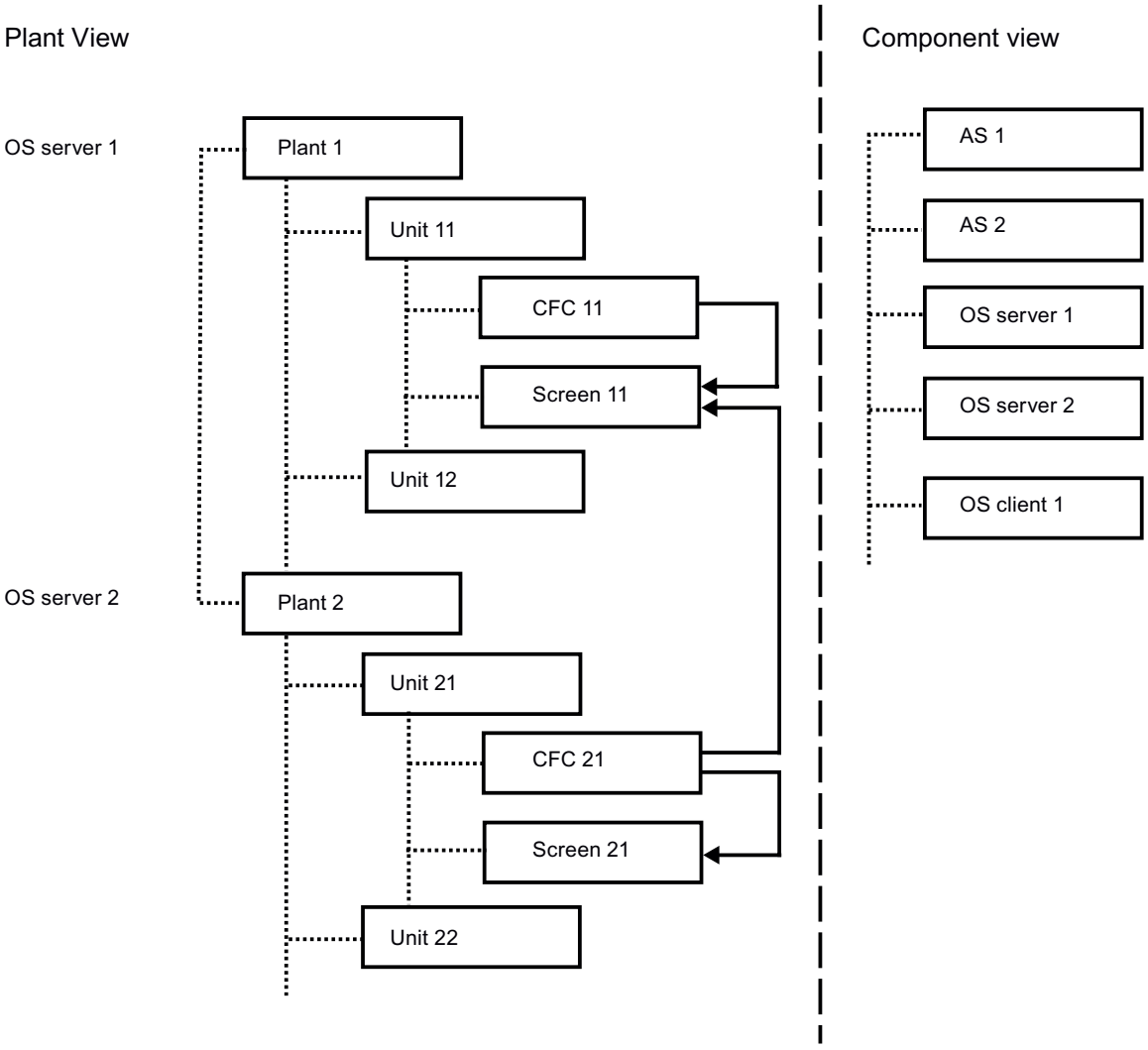
When downloading server data, observe these guidelines:

- 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.

14.2 Example Configuration for Tag Connection

Introduction to the example project

We will use this example project to illustrate the configuration tasks that are required so that you may gain a clearer idea of how the various pieces of the puzzle fit together:



Explanations

Information on 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.

14.3 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 from the tree view.
3. Select **Options > OS > Generate Server Data**
4. Select OS server 2 from the tree view.
5. Select **Options > OS > Generate Server Data**
   The required server data are generated.
6. Mark OS Server 1 in the SIMATIC Manager and select the menu command **Options > OS > Assign OS Server…**.
   The "Assigning OS-Server for [name of OS]" dialog box opens.
7. In the "Assigning OS-Server for [name of OS]" dialog box, mark OS Server 2.
8. Click "OK"
   The tag set-up now contains all necessary tags for cross-server tag connection to OS Server 2.
9. Open "Picture 11" in the Graphics Designer.
10. Carry out the tag connection:
    - Carry out the tag connections with CFC 11.
      You are familiar with the procedure:
      Data source "ES tags" and selection of tags in plant hierarchy
    - Carry out the tag connections with CFC 21.
      This procedure is for a cross-server tag connection:
      Data source "WinCC tags" and selection in folder
      "WinCC tags/ [Name of server data]/ SIMATIC S7 Protocol Suite/ [Connection]/ S7 program"

NOTICE
Please note the following: • Only use data sources with WinCC tags. • If you rename a CFC chart in the 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. Mark OS Server 1 in the 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:
    - Disable all checkboxes in the "Data" group.
    - Activate the "Changes" check box in the "Scope" group.
14. In SIMATIC Manager, mark 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 from OS Server 1 and OS Server 2 to the target station.

    Note

    Enable the check box marked "The entire WinCC project".

16. Open the WinCC project of the OS client 1 and download the server data from OS server 1 and OS server 2.
17. Download the data of OS Client 1 onto the target station.

Using PCS 7 Maintenance Station 15

15.1 Using the PCS 7 Maintenance Station

Diagnostic and maintenance functions with the PCS 7 maintenance station

PCS 7 provides you with the following options in terms of its diagnostic and maintenance functions:

- You can monitor the various components of a PCS 7 system centrally on a PC station.
- You can display the status in process mode. This status is represented with defined icons.

In order to make use of the diagnostic and maintenance functions, a PCS 7 maintenance station must be configured.

PCS 7 maintenance station (asset management)

The PCS 7 maintenance station is specially configured and set for diagnostic and maintenance functions.

The PCS 7 maintenance station (MS) is operated in the following configurations:

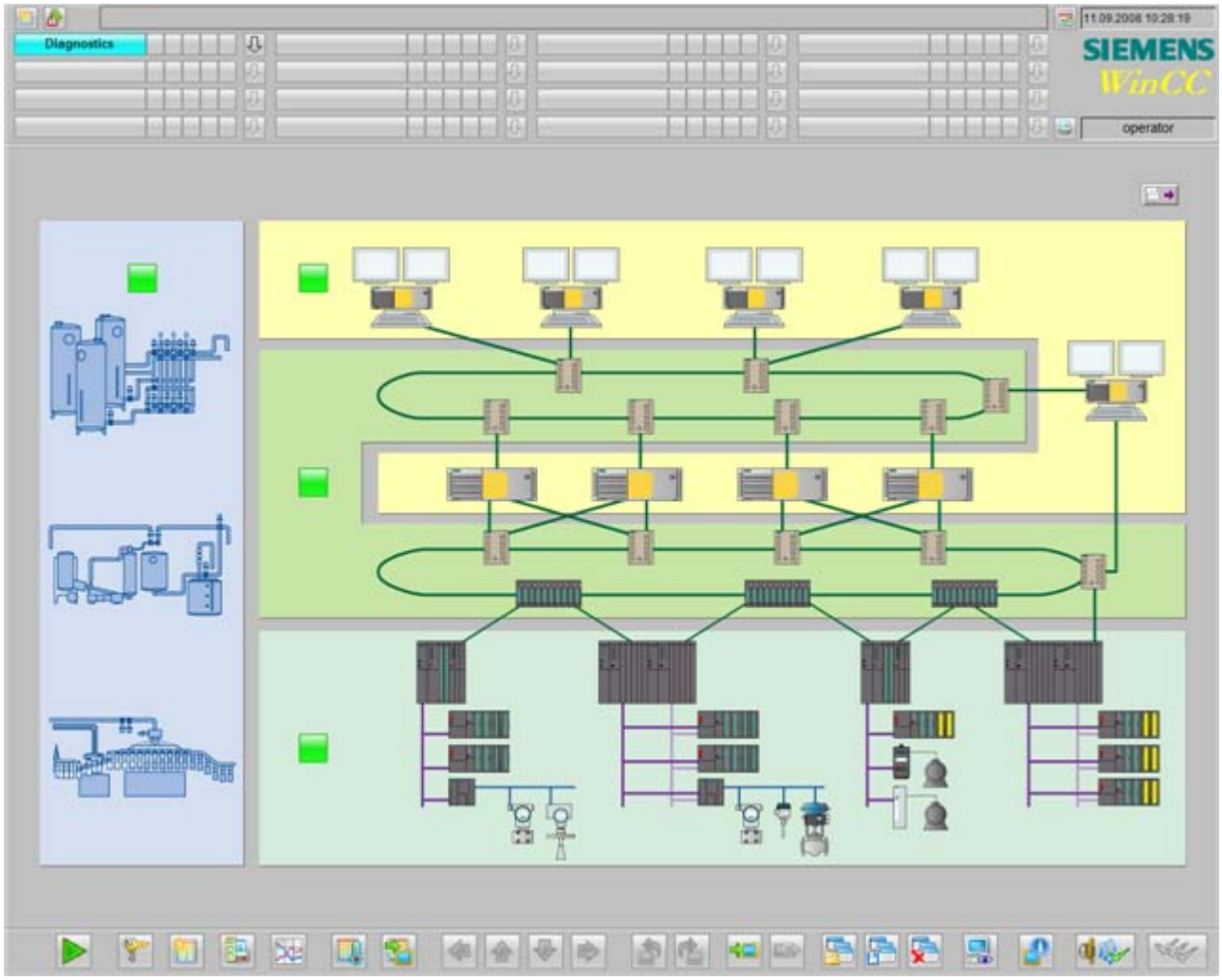
- MS multi-user system in an OS multi-user system
- MS single station system on an OS single station system

A dedicated "Diagnostics" area is created for the diagnostic screens of the PCS 7 maintenance station.

Plant operators can view information about the status of PCS 7 components in diagnostics screens with a hierarchical structure.
Further information is available in the section "Which Components are Monitored by the PCS 7 Maintenance Station".

There are two ways of creating diagnostics screens for the PCS 7 system:

- Diagnostic screens for process control diagnostics.
  These diagnostic screens are generated automatically.
- Diagnostic screens in a user diagnostics area.
  These diagnostic screens are configured.



Which components are monitored by the PCS 7 maintenance station?

You can find information on the states of the following diagnostics-capable PCS 7 components on the maintenance station's special diagnostics screens:

Area	Diagnostics for ...
Automation systems	• CPU • SIMATIC PCS 7 BOX • Distributed I/Os, such as ET 200M, ET 200S, ET 200iSP, ET 200PRO, input and output modules • Field devices (HART, PROFIBUS PA, ...) • Fail-safe modules • Interface modules (IM) • Couplers • Link modules • Diagnostic repeaters
PC stations	• Operator stations • BATCH stations • Route Control stations • Central archive server • SIMATIC PCS 7 BOX • Siemens industrial PCs
Ethernet components	• Switches, e.g. – SCALANCE X – OSM – ESM • Other SNMP-compatible devices – e.g. printers, bridges, routers

Operator control and monitoring of components via the Internet/Intranet

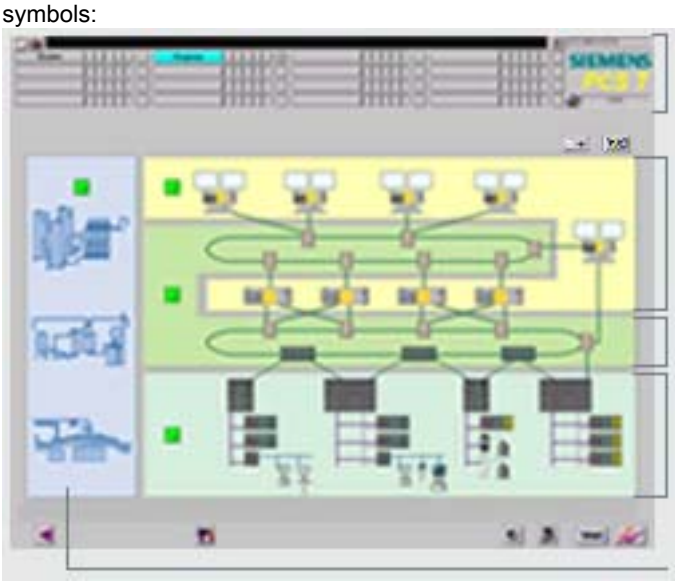
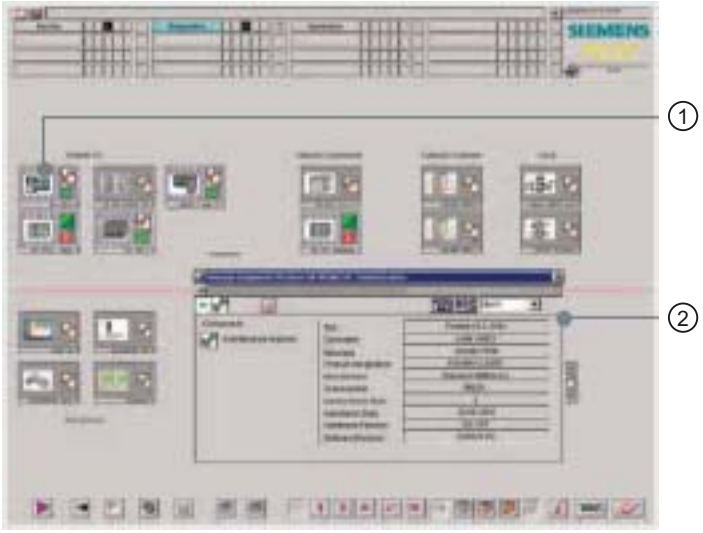
With OS Web Option, you can monitor and control components via the Internet/Intranet.

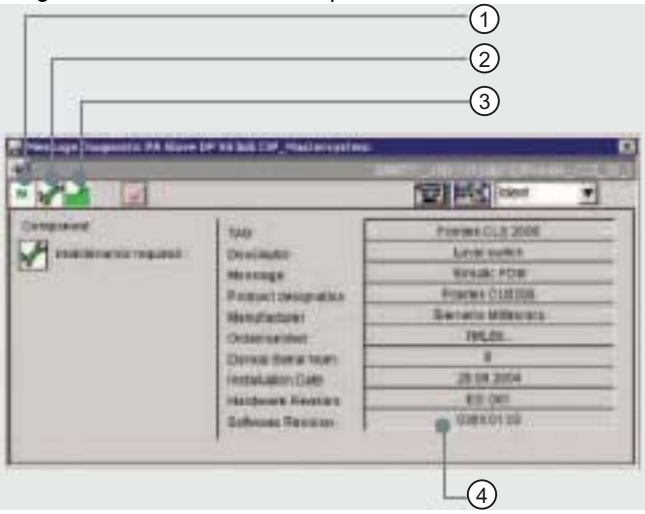
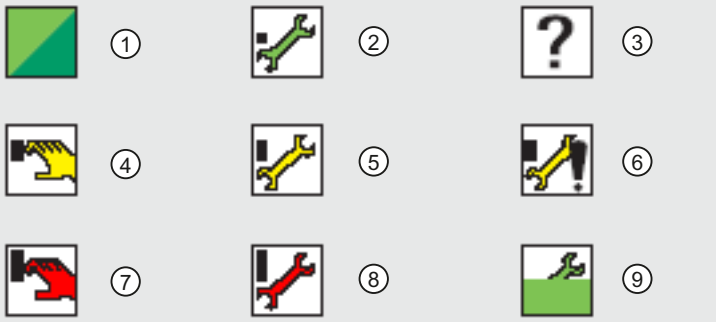
Further information

- is available in the section "Using the OS Web Option (Page 376)"
- *Process Control System PCS 7; OS Web Option* manual

15.2 Diagnostic functionality

Overview of diagnostics functions

Picture hierarchy	Description
Plant overview in which components are represented by means of symbols:  ① Group display for subordinate structure ② Select PC level ③ Select Ethernet level ④ Select AS level ⑤ User diagnostics area	The diagnostics overview screen can be opened via the "Diagnostics" area selector button in the overview area. • The diagnostics overview screen contains the group display for the lower-level diagnostics structure in the overview area • The diagnostics overview screen contains all the PCS 7 components that are being monitored in the working area, for example, PC stations, network components, automation systems and the user diagnostics area for the project. All the other diagnostic screens are shown at levels below the overview screen, laid out hierarchically.
Overview of components on a PROFIBUS line with icons:  ① Icon ② Component faceplate	Each object is shown as a block icon in the diagnostic screens. If you click on an individual block icon, you can open the diagnostic screen with further information, and thereby navigate through the entire hierarchy step-by-step. This will provide you with an increasing degree of detail in your diagnostic information.

Picture hierarchy	Description
Diagnostics screen for the components:  ① Diagnostics status ② Request status ③ Maintenance status ④ Identification of the component	If a fault is signaled in the overview screen, the operator can access the diagnostic faceplate for the component in question quickly via the loop-in-alarm function.
Extract from the icon set:  ① Good ② Maintenance required (low) ③ Maintenance job unknown/not requested ④ Simulation ⑤ Maintenance required (medium) ⑥ Maintenance job requested ⑦ Local operation ⑧ Maintenance alarm (high) ⑨ Maintenance job in progress	Diagnostic and maintenance icons in the block icons and within faceplates provide further detailed information about diagnostics and about the status of the maintenance measures.

Extended online diagnostic function in conjunction with SIMATIC PDM

When using SIMATIC PDM in process mode, additional detailed information can be called up for hardware objects (assets) which are described by means of electronic device description (EDD) in accordance with IEC 61804 2:

- Detailed diagnostic information
  - Manufacturer's device-specific information
  - Notes on error diagnostics and troubleshooting
  - Additional documentation
- Display of the assigned modification logbook (audit trail) for these components, with all the details entered about the operator, time and nature of the actions taken on the component
- View of the component parameters (representation of the parameters which are saved in the component and in the project; where necessary, also the difference between these two).

The "loop-in-HW Config" and "loop-in-PDM" functions

In process control you can display the following views in the faceplate via icons:

- Parameter view of SIMATIC PDM for the corresponding device (Loop-in-PDM)
- Online view of the hardware project (Loop-in-HW-Config)

You can display the parameter view on an MS client.

On an MS client that is operated on the engineering station, you can also display the online view of the hardware project.

Representation of redundant objects in the process control

In the case of redundant PC stations, one block icon appears for every PC station.

In the case of redundant automation systems and their I/Os, only one block icon appears on the highest hierarchy level for the object and for the redundant object.

If the object and redundant object fail, this is shown on the block icon. Both objects appear one level down in the hierarchy.

Further information

- Detailed information about the meaning of the individual symbols is available in the *Process Control System PCS 7; OS Process Control* manual.
- Further information about working with functions on the MS Client in process mode is available in the *Process Control System PCS 7; OS Process Control* manual.

15.3 System configuration of PCS 7 Maintenance Station

15.3.1 PCS 7 Maintenance Station in Various Plant Configurations

System configurations

When a maintenance station is integrated, the following system configurations are possible:

- MS multiple station system in the OS multiple station system
- MS single station system on an OS single station system

15.3.2 Components of the PCS 7 Maintenance Station

Introduction

The basis of a maintenance station is always an OS that provides additional maintenance functions. This OS is the MS server.

MS multiple station system in the OS multiple station system

In distributed systems, the maintenance station is integrated into a client/server architecture.

Configuration	Description
MS Server	The MS server processes the process control messages. The process control messages from the AS are visualized on the MS client. MS servers can be configured redundantly. You can utilize the MS server functionality on a PC station with an OS server or on a separate PC station.
MS client	The MS client uses diagnostic screens to visualize the diagnostic status in the diagnostic area and provide the required operator control and monitoring functions. The server data of the MS server (MS server package) are loaded on the MS client.

MS single station system in the OS single station system

In distributed systems, the maintenance station is operated as an MS server on the engineering station.

Configuration	Description
MS server	The MS server processes the process control messages. The MS server uses diagnostic screens to visualize the diagnostic status in the diagnostic area and provide the required operator control and monitoring functions. The process control messages from the AS are visualized on the MS server. The server data (OS server packages) are loaded on the MS server.

15.3.3 The MS Server

Configuring the MS server

When an OS server is assigned within the context of creating the diagnostic structure in the plant hierarchy, it is configured as an MS server. The diagnostic structure is a folder structure in the plant hierarchy in which all the diagnostic screens are stored hierarchically.

The MS server is compiled and downloaded in exactly the same way as a standard OS server.

What data are stored on the MS server?

The following data are stored on the MS server:

- Diagnostic screens including the hierarchical structure
- SNMP OPC server tags
- Special tags for the diagnostic status
- Status tags for PC stations and network components
- Export file (information for diagnosable objects such as field devices, PCs and network components)

Monitoring network components on the plant bus

If you execute the monitoring of the network components on the plant bus with the MS server and you use the CP 1613 or CP 1623 for access to the plant bus, then configure the network settings for the SIMATIC CP 1613 NDIS adapter or the SIMATIC CP 1623 NDIS adapter.

Detailed, step-by-step instructions are available in the *Process Control System PCS 7; PC Configuration and Authorization* manual.

15.3.4 The MS Client

Configuring the MS client

An MS client is configured and downloaded in the same way as an OS client.

The server data of the MS server are loaded on the MS client.

15.3.5 MS multiple station system in the OS multiple station system

Configuration with MS server and MS client

The MS server is configured on a separate PC station.

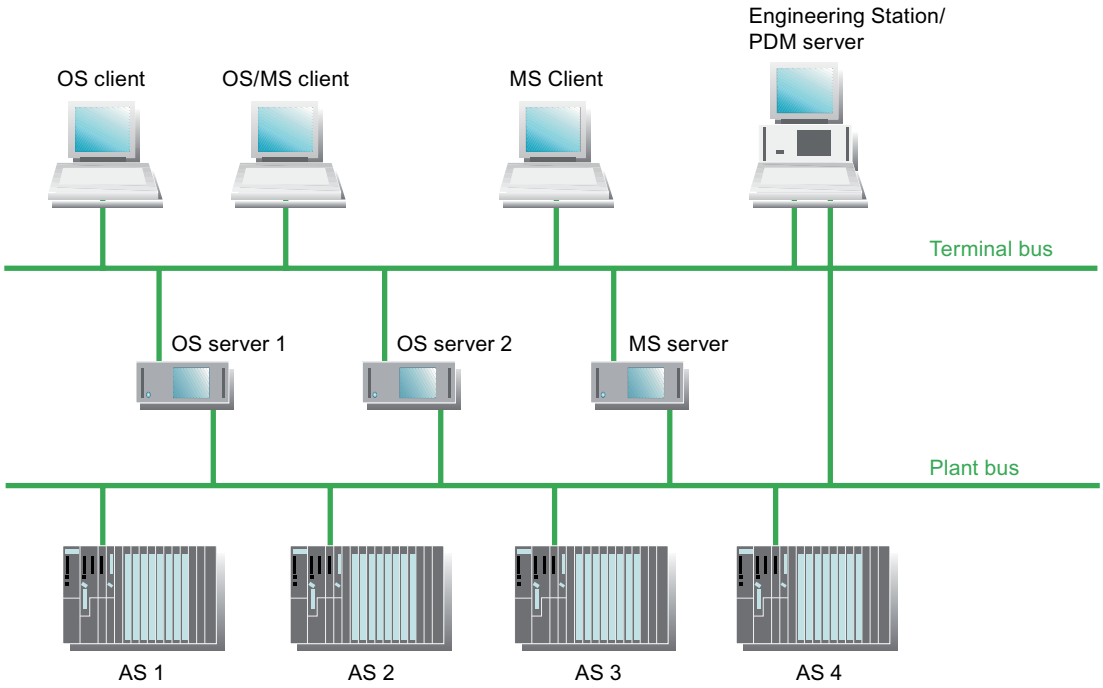
The MS client can be configured:

- On a separate PC station as an MS client
  The "Diagnostic" area is displayed.
- On an OS client as an MS client/OS client
  The "Diagnostic" area and the areas of the OS server are displayed.
- On the engineering station as an MS client
  The "Diagnostic" area is displayed.
  The online view of the hardware project can be opened.
  The MS client that is operated on the engineering station is disabled during OS configuration.

Plant configuration

The figure below shows an example plant configuration.

The PDM server is only available as of SIMATIC PDM V7.0.



Software and licenses required for the maintenance stations

If intelligent field devices have to be monitored, install SIMATIC PDM on the engineering station.

You can find further information about the software and the licenses in the *Process Control System PCS 7; PC Configuration and Authorization* manual.

Requisite server data on the MS client

Server data of the MS server must be loaded on the MS client.
If an MS client is simultaneously used as on OS client, the server data of the OS servers must also be loaded.

15.3.6 MS single station system in the OS single station system

Configuration as single station system

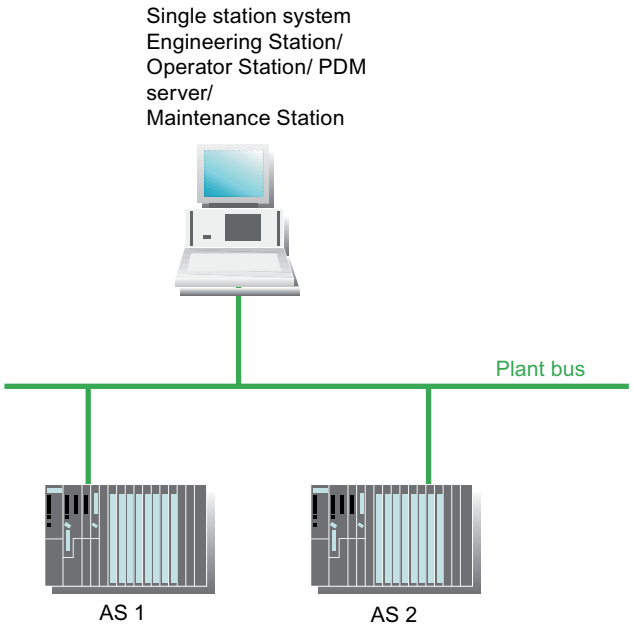
The MS server, MS client, engineering station (ES), and OS are operated on a PC station.

In this plant configuration, the maintenance station must be configured as a single workstation system.

Plant configuration

The figure below shows an example plant configuration.

The PDM server is only available as of SIMATIC PDM V7.0.



Rule

The maintenance station is disabled during OS configuration.

Requisite software and licenses for the maintenance station

If intelligent field devices have to be monitored, install SIMATIC PDM on the engineering station.

You can find further information about the software and the licenses in the *Process Control System PCS 7; PC Configuration and Authorization* manual.

15.4 Overview of Diagnostic Structure

15.4.1 Overview of Diagnostic Structure

Relationship between the diagnostic structure and plant hierarchy

The diagnostic structure is derived from the plant hierarchy. For this purpose, a "Diagnostics" folder is defined in the plant hierarchy as a separate OS area and is assigned to the MS server.

The "Diagnostics" folder contains the "AS objects", "Network objects" and "PC stations" folders. The "Diagnostics" folder can be optionally supplemented with one user-specific folder created in parallel to the "AS Objects" level. A user diagnostic structure can be formed based on technological aspects in this folder.

Example configuration of a plant hierarchy

The following table shows an example configuration of a plant hierarchy.

Depending on the OS area level, a corresponding number of subfolders named "Diagnostics" is created.
Additional information on the OS area levels is available in the section "How to define area identifiers (Page 60)".

Plant hierarchy			
	Diagnostic structure		
First hierarchy level	Second hierarchy level	Third hierarchy level	Fourth hierarchy level
Project	Diagnostics	"Overview" screen	
		AS objects	"AS objects" overview screen
		Network objects	"Network objects" overview screen
		PC stations	"PC stations" overview screen
		Optional: user-specific objects	freely configurable by the user

Special aspects of the multiproject

Please note the following in the case of the multiproject:

- There is only one MS server within a multiproject.
- In a multiproject, the "Diagnostics" hierarchy folder is inserted in all the projects within the multiproject.
- The complete diagnostic structure is automatically created in the project with the MS Server, with the folders "AS Objects", "Network Objects" and "PC Stations". The structure for the user diagnostics must be created manually.
- The only folder which is automatically created within the diagnostic structure of the other projects in the multiproject is "AS Objects".
  A folder for "user-specific objects" can be created parallel to the "AS Objects" level.

Diagnostic structure and user rights

The "Diagnostics" folder is a separate OS area. You can define the user rights for the diagnostic area, just as you can do for all the other OS areas. The user rights are specified in the "User Administrator" editor in WinCC.

You can find additional information about this in the section "Overview of User Rights (Page 115)".

15.5 Overview of Configuration Tasks

15.5.1 Overview of PCS 7 Maintenance Station Configuration Tasks

Below is an overview of the individual steps for configuring the PCS 7 maintenance station. The overview table below is set out in the recommended order. You can find detailed information about each individual configuration tasks in the following sections.

Overview of the Steps in Configuration

Explanation of the table:

- "Diagnostics structure" column:
  You perform these configuration tasks to generate the diagnostics structure with the sublevels AS object, network components and PC stations. The diagnostics provide you with diagnostic information about all PCS 7 components that are monitored, for example, PC stations, network components and automation systems of the project.
- "User-specific diagnostics structure" column:
  In addition to standard diagnostics, you can supplement a user-specific diagnostic structure with additional sublevels in parallel to the AS object level.

What?	Where?	Diagnostics structure	User-specific diagnostics structure
Configuring the MS server (Page 303)	SIMATIC Manager	X	X
Configuring the MS client (Page 304)	SIMATIC Manager	X	X
Creating the diagnostics structure (Page 305)	SIMATIC Manager	X	
Adding a user-specific diagnostics structure to the diagnostics structure (Page 310)	SIMATIC Manager		X
Generating diagnostics with OPC Server (SNMP modules) (Page 312)	SIMATIC Manager	X	
Creating/updating the diagnostics screens (Page 322)	SIMATIC Manager	X	
Creating user diagnostics screens (Page 324)	SIMATIC Manager		X
Integrating SIMATIC PDM into the detailed diagnostics (Page 325)	SIMATIC Manager	X	
Compiling the OS (Page 326)	SIMATIC Manager	X	X
Creating the group display hierarchy for user diagnostic screens (Page 327)	WinCC Explorer		X
Inserting dynamic objects (Page 136)	WinCC Explorer		X
Configuring dynamic objects (Page 137)	WinCC Explorer		X
Specifying object properties (Page 136)	WinCC Explorer		X
Generating WinCC tags for OPC Server (Page 314)	SIMATIC Manager	X	
Configuring the storage path for the entire export file (Page 330)	WinCC Explorer	x	
Configuring the storage path for the individual export file (Page 333)	WinCC Explorer	X	
Downloading server data to other OS servers (Page 348)	SIMATIC Manager	X	X
Downloading the MS server (Page 357)	SIMATIC Manager	X	X

15.6 Configuring an MS server and an MS client

15.6.1 How to Configure an MS Server

Requirement

- The project or multiproject has been created.

Procedure

1. In the component view of the SIMATIC Manager, select the project into which you want to insert the MS server.
2. Select the **Insert > Station > SIMATIC PC Station** command. A new SIMATIC PC station is inserted into the selected project.
3. Mark the SIMATIC PC station and select the menu command **Edit > Object Properties** and enter the required name in the "Computer" input box.
   Enter the Windows name of the computer in the "Computer name" input box.
4. Click "OK".
5. Select the SIMATIC PC station in the component view of the SIMATIC Manager.
6. In the detailed view, open HW Config by double-clicking "Configuration" object.
   The hardware configuration of the SIMATIC PC station opens.
7. If the hardware catalog is not visible, select the **View > Catalog** command to open the hardware catalog.
8. Under "SIMATIC PC Station > HMI" in the hardware catalog, select the WinCC application and drag it into the configuration table:
   - WinCC application (for MS Server and an MS single-station system)
   - WinCC application (stby) (for a redundant MS Server)
9. Insert any additional components, for example, network cards.
10. Select the menu command **Save and Compile Station** and close HW Config.
11. In the component view of the SIMATIC Manager, select the "[OS]" object underneath the MS server's SIMATIC PC station.
12. Select the **Edit > Object properties** command.
    The "Properties – OS[OS Name]" dialog box opens.
13. If you are using an MS server in an OS multiple-station system, select the "Target OS" tab and enter the path to the target OS computer for the MS Server.
    If you are operating an MS server in a multiple-station system on the engineering station, there is no need to enter anything here.
14. If you are using a redundant MS server, select the "Target OS and Standby OS" tabs.
    Enter the path to the target OS computer for the MS server and enter the redundant MS server as a standby OS.
15. Click "OK".

15.6.2 How to Configure an MS Client

Introduction

Create a PC station for the MS client in the project or multiproject.

Note

If you have already created a PC station (e.g. for OS simulation) for the engineering station in the project or multiproject, nothing may be entered in the "computer name" input box for this PC station.

Requirements

- The project or multiproject has been created.

Procedure

1. In the component view of the SIMATIC Manager, select the project into which you want to insert the MS client.
2. Select the menu command **Insert > Station > SIMATIC PC Station**. A new SIMATIC PC station is inserted into the selected project.
3. Select the SIMATIC PC station, and then select **Edit > Object Properties**.
4. Go to the "Name:" input field to enter a name.
5. Enter the Windows computer name in the "Computer name" input box.
6. Click "OK".
7. Select the SIMATIC PC station in the component view of the SIMATIC Manager.
8. In the detailed view, open HW Config by double-clicking "Configuration" object.
   The hardware configuration of the SIMATIC PC station opens.
9. If the hardware catalog is not visible, select the **View > Catalog** command to open the hardware catalog.
10. Under "SIMATIC PC Station > HMI" in the hardware catalog, select the WinCC application client (for the MS client on the engineering station) and drag it into the configuration table.
11. Insert other components.
12. Select the menu command **Save and Compile Station** and close HW Config.
13. In the component view of the SIMATIC Manager, select the "[OSC]" object underneath the MS client's SIMATIC PC station.
14. Select the menu command **Edit > Object Properties**.
    The "Properties - Client OS: [Name of the OS]" dialog box is opened.
15. Enter a name for the Ms client.
16. Click "OK".

15.7 Creating/deleting the diagnostic structure

15.7.1 How to Create the Diagnostic Structure

Requirements

- The project or multiproject has been created.

  Note

  Ensure that the names of the S7 programs within a multiproject are unique. Only then can you change directly to the hardware configuration in process mode when using the diagnostic and maintenance functions.

- The AS objects have been inserted.
- The PC stations have been inserted.
- The network configuration is complete.

Rule

NOTICE
After creating the diagnostic structure, do not change the names of the hierarchy folders in the plant hierarchy that relate to the maintenance station.

Procedure

1. Open the plant view in the SIMATIC Manager.
2. Select the object in the tree view:
   - If you are using a multiproject, select the object "[name of the project] MP".
   - If you are using a single project, select the object "[name of the project]".
3. Select the menu command **Options > Plant Hierarchy > Settings...**. A dialog box is opened, depending on the object selected.
4. If you have selected a multiproject, the "Plant Hierarchy – Settings" dialog box is opened. Select the project whose plant hierarchy settings you wish to use as a template.
   - Click "OK".
     The "Plant Hierarchy Settings" dialog box opens.
   - Proceed to step 6.
5. If you have selected an individual project or a project within a multiproject, the "Plant Hierarchy - Settings" dialog box opens.

6. Define the settings for the relevant levels.

Note

When the diagnostic structure is created, PCS 7 creates several additional subfolders and diagnostics screens. It automatically assigns the names for these folders/diagnostics screens. Ensure that the maximum number of characters is adequate.

7. Enable the "Derive diagnostics screens from the plant hierarchy" check box.

Note

You can only enable the checkbox if you had previously enabled the "Derive screen hierarchy from the plant hierarchy" checkbox and if you have a license to configure the maintenance station.

Note

Enabling the "Derive diagnostic screens from the plant hierarchy" check box requires a complete download of the OS defined as the MS server. The MS server must be disabled in order to perform a complete download.

8. When creating/updating the diagnostic screens, specify whether the names of the created hierarchy folders should be derived from the name or the commentary for the hardware components. Enable the appropriate checkbox:
   - "Derive PH names from the names of the hardware components" checkbox
   - "Derive PH names from the commentaries on the hardware components" checkbox
     Since there aren't any restrictions on the characters used in the commentary texts, you can use any names for this.
9. Click "OK".
   The "Define maintenance station" dialog box is opened, and all the OS servers are shown.
10. Select which OS server you wish to define as the MS server and click "OK".
    The diagnostic structure is created as an OS area, along with the corresponding subfolders, in all the projects. The diagnostic structure is created with all the hierarchy folders in the project with the MS server. The diagnostic structure is only assigned the "AS objects" folder in projects without the MS server.

15.7.2 How to delete the diagnostic structure

Requirement

- The diagnostic structure has been created.

Procedure

1. Open the plant view in the SIMATIC Manager.
2. Select the object in the tree view:
   - If you are using a multiproject, select the object "[name of the project] MP".
   - If you are using a single project, select the object "[name of the project]".
3. Select the **Extras > Plant Hierarchy > Settings** command.
   The "Plant Hierarchy - Settings" dialog box opens.
4. Proceed as follows if you have selected a multiproject:
   - Click "OK".
     The "Plant Hierarchy - Settings" dialog box opens.
   - Proceed to step 6.
5. If you have selected an individual project or a project within a multiproject, the "Plant Hierarchy - Settings" dialog box opens.
6. Disable the "Derive diagnostic screens from the plant hierarchy" check box.

Note

Disabling the "Derive diagnostic screens from the plant hierarchy" check box requires a complete download of the OS defined as the MS server. The MS server must be disabled in order to perform a complete download.

7. Click "OK".

NOTICE
The complete diagnostic structure and all the diagnostic screens are deleted, including the user diagnostic structure. The driver charts, which are contained in the hierarchy folders for the diagnostic structure, are not deleted during this process; they remain in the chart folders for the S7 programs.

15.8 Creating the user diagnostic structure

15.8.1 User diagnostic structure

Introduction

You will need to refer to the information in this section if you wish to add a user-specific diagnostic structure to the diagnostic structure.

User diagnostic structure

In the plant hierarchy, you can create **one** other folder under the "Diagnostics" folder and additional subfolders within this folder to build a user diagnostic structure based on technological aspects.

User-created diagnostics logs can be inserted into the user diagnostic structure. The diagnostic functions are created with the aid of the ASSETMON block from the *PCS 7 Library*.

You can incorporate buttons into the diagnostics screens for switching between the user-created and automatically created diagnostics screens.

Diagnostic function with the ASSETMON block

The "ASSETMON" block is used to monitor user-specific sections of the plant components.

The "ASSETMON" block can be used to monitor three analog values.
Each of the analog values can be monitored:

- for three upper limits
- for a quality code

The following inputs are also available to you:

- 7 inputs for messages
- 16 inputs for displaying message texts with corresponding status displays
- 1 input for the maintenance status

The message texts from the 16 inputs are saved in the electronic device description (EDD) and are allocated to the block on the basis of the assignment of the PLT-ID.

For further information, refer to the *CFC* Online Help.

Cascading the status of process values

Using the "ST_MUX" multiplex block, you can interconnect the status of different process values weighted to the "ASSETMON" block. The status with the highest priority is shown in the faceplate in process mode.
The status must conform to PA profile 3.x.

Cascading the maintenance status

Using the "MS_MUX" multiplex block, you can interconnect the maintenance status of different "ASSETMON" blocks to a higher level "ASSETMON" block. The maintenance status with the highest priority is shown in the faceplate in process mode.

Overview of the Steps in Configuration

Configuring the user diagnostic structure involves the following topics:

What?	Where?
Creating the user diagnostic structure (Page 310)	SIMATIC Manager
Creating the user diagnostics screens (Page 324)	SIMATIC Manager
Compiling the OS (Page 326)	SIMATIC Manager
Creating the group display hierarchy (Page 327)	WinCC Explorer > "Graphics Designer" editor

15.8.2 How to Add a User Diagnostic Structure to the Diagnostic Structure

Requirement

The diagnostic structure has been created.

Procedure

1. Open the plant view in the SIMATIC Manager.
2. In the plant hierarchy, select a project for which you wish to create a user diagnostic structure.
3. In the tree view, select the diagnostic hierarchy folder under which the "AS objects" folder is directly located:
4. Select the **Insert > Plant Objects > Hierarchy Folder** menu command.

   Note

   There may only be one hierarchy folder created for the user diagnostic structure under the "Diagnostics" hierarchy folder.

5. Mark the hierarchy folder in the detail view and select the menu command **Edit > Rename**.
6. Enter as short a unique name as possible and press Enter.
   The name is applied.
   Other hierarchy subfolders can be created under this hierarchy folder.

   Note

   N.B. You may used up to 128 characters in tag name.
   For further information about this, refer to the section "Length of Tag Names (Page 132)".

7. Select the hierarchy folder in the tree view.
8. Select the menu command **Insert > Plant Objects > CFC**.
   A new CFC chart is created.
9. Mark the CFC chart in the detail view and select the menu command **Edit > Rename**.
10. Enter as short a unique name as possible and press Enter.
    The name is applied.
    Heed the instructions in step 6.
11. Mark the CFC chart in the detail view and select the menu command **Edit > Open Object**.
12. Select the "ASSETMON" block from the PCS 7 library and drag it into the CFC chart.
13. Interconnect the signals, which are to be displayed via the PCS 7 maintenance station, using the "ASSETMON" block.
    You can find further information about the "ASSETMON" block in the Online Help for the PCS 7 library.
14. Perform steps 2 to 13 for all the projects in a multiproject for which you wish to create a user diagnostic structure.

15. The following steps are only required for products in which the MS server is not located. In the case of multiprojects, select the project in the "plant hierarchy" for which you have created a user diagnostic structure.
16. Select the menu command **Plant Hierarchy > Synchronize in the Multiproject** in the shortcut menu.
    The "Plant Hierarchy - Synchronize in the Multiproject" dialog box opens.
17. Click "OK".
    The "Plant Hierarchy > Synchronize in the Multiproject (target project)" dialog box opens.
18. Enable the check box for the MS server's current project.
19. Click "OK".
20. Perform steps 15 to 19 for all the projects in a multiproject for which you have created a user diagnostic structure.

Further information

You can find further information on how to create CFC charts in the *Process Control System PCS 7; Engineering Station* manual.

15.9 Generating diagnostics with OPC server (SNMP modules)

15.9.1 OPC Server and SNMP Modules

Diagnostics of SNMP modules

If you use SNMP modules in your system configuration, you can make use of the diagnostics functions by using an OPC server. SNMP is the Simple Network Management Protocol that is used to manage networks. SNMP modules include switches (SCALANCE), for example. OPC means OLE for Process Control and is an interface for data exchange in automation engineering.

Overview of the Steps in Configuration

Setting up the OPC server and SNMP modules involves the following:

Step	What?
1	Installation of the OPC server on the PC station that you are using as the MS server
2	Installation of the OPC server on the PC station (Page 313)
3	Assignment of all SNMP modules to the OPC server (Page 314)

Naming rules

When assigning names to SNMP modules, observe the following:

- Do not use spaces or special characters in SNMP module names.
- For IPCs, assign SNMP module names that correspond to the computer name of the IPC in the SIMATIC Manager.
- For all other SNMP modules, assign SNMP module names that are different from the existing computer names of PC stations in the project.
- If you use two separate Ethernet networks in your configuration, make sure that both the names and the IP addresses of the SNMP modules are unique across the network.

Display in process mode

SNMP modules are mapped as PC objects or as network objects in the overview picture.

All PC stations that are configured in the SIMATIC Manager and to which the profile IPC_v** is assigned are mapped as PC objects. All other objects are mapped as network objects.

15.9.2 Device profiles and community

The following table shows the assignment of the community to the device profile:

Components	Device profile	Community
SCALANCE Class X200	Profil_SCALANCE_X200_V11.txt	Public
SCALANCE Class X200IRT	Profil_SCALANCE_X200_V11.txt	Public
SCALANCE Class X300X400 V30	Profil_SCALANCE_X300X400_V30.txt	Public
SCALANCE Class X400	Profil_SCALANCE_X400_V11.txt	Public
SCALANCE Class X408	Profil_SCALANCE_X400_V22.txt	Public
ESM/OSM	Profil_OSM_V10.txt	Public
IPC (Industrial PC)	Profil_IPC_V13.txt	SOL
Other devices for example, network adapters or switches	MIB-II_V10.txt	Determine the community configured in the device.
All devices that were integrated by means of import, but are not to be displayed	No SNMP	

15.9.3 How to Insert the OPC Server

Requirement

An OS server has been added and configured on a SIMATIC PC station.

Procedure

1. In SIMATIC Manager, open the component view.
2. Select the SIMATIC PC station of the MS server and open HW Config by double-clicking the "Configuration" object in the detail view.
   The hardware configuration of the SIMATIC PC station opens.
3. If the hardware catalog is not visible, select the **View > Catalog** command to open the hardware catalog.
4. Under "SIMATIC PC Station > User application > OPC server" select the OPC server and drag it into the PC station.
5. Select the **Station > Save and Compile** command.

15.9.4 How to Assign SNMP Modules to the OPC Server

Requirements

- The HW configuration for the PC objects and network objects is completed.
- The OPC server has been inserted.

Procedure

1. In HW Config, select the OPC server, then select the menu command **Edit > Object Properties...**.
   The "Properties – OPC Server" dialog box opens.
2. Open the "SNMP" tab.
3. Enter at least 1000 ms in the "Cycle time" input box.
4. Click "Edit Plant Configuration".
   The "Edit Plant Configuration" dialog box opens.
5. Click "Import".
   All objects assigned an IP address in HW Config are automatically imported.
6. Double-click the node.
   The "Edit Node" dialog box opens.
7. Enter the following data for the imported devices.
   - Name:
     Enter a name.
   - IP address:
     Enter the IP address if the device was not imported.
   - Device profile and Community:
     Corresponding information is available in the section "Device Profiles and Community" (Page 313)

NOTICE
Note that these community name entries are case sensitive. The community name in the "Edit Node" and "Add Node" dialog boxes must match the community name stored in the respective device.

   - Time-out:
     Enter a value of 9000 ms or higher, depending on the number of components to be monitored.
   - Comment:
     You can enter a comment in this field. This comment is visualized in the faceplate of the process control system.

8. Click "OK".
   The "Edit Nodes" dialog box closes and the "Edit Plant Configuration" dialog box opens.
9. Click "Add" if your plant configuration contains IPCs (industrial PCs, for example) or additional SNMP modules that are not imported automatically.
   The "Add Node" dialog box opens.
10. Enter all necessary data.
    Proceed as described in item 7.
11. Click "OK".
    The "Add Node" dialog box closes and the "Edit Plant Configuration" dialog box opens.
12. Insert additional nodes as required.
13. Click "Export tags for WinCC.
    The system generates all tags and messages for the SNMP modules.
14. Click "OK".
    You completed the configuration.
15. Compile and download the HW configuration data.
    Further information is available in the *Process Control System PCS 7; Engineering System* manual.
16. Create/update the diagnostic screens.
    Additional information is available in the section titled "How to create/update diagnostic screens (Page 322)".
17. Compile the MS server.
    Further information is available in the section "Compiling an OS (Page 92)".

15.9.5 How to Insert the OPC Server to a Redundant MS Server

Requirements

- An OS server has been added and configured on a SIMATIC PC station.
- OPC Server is configured in MS Server.
  Further information is available in the section "How to Assign SNMP Modules to the OPC Server (Page 314)".

Procedure

1. In SIMATIC Manager, open the component view.
2. Select the SIMATIC PC station of the MS server and open HW Config by double-clicking the "Configuration" object in the detail view.
   The hardware configuration of the SIMATIC PC station opens.
3. Select the OPC server.
4. Select **Edit > Copy** from the menu.
5. Select the SIMATIC PC station of the redundant MS server and open HW Config by double-clicking the "Configuration" object in the detail view.
   The hardware configuration of the SIMATIC PC station opens.
6. Select the position for the OPC server.
7. Select the **Edit > Paste** command.
8. Select the **Station > Save and Compile** command.

15.9.6 How to Use a DHCP Server

Monitoring SNMP modules in plant configurations with a DHCP server

Changes cannot always be made in the case of plant configurations featuring a DHCP server that contains SNMP modules to be monitored (e.g., industrial PCs).

In the case of SNMP modules that obtain their IP address from a DHCP server, please observe the following:

- Check the IP addresses following a DHCP server failure.
- If necessary, modify the IP address manually.

Procedure

1. Adapt the IP address of the corresponding nodes.
   Further information is available in the section "How to Assign SNMP Modules to the OPC Server (Page 314)".
2. Compile and download the hardware configuration of the MS server.
3. Generate the diagnostic screens for the network objects and PC stations.
   You can find further information about this in the section "Requirements for generating diagnostic screens (Page 319)".
4. Compile the MS server.
   Additional information is available in the section "How to Compile Multiple Operator Stations (Page 95)" from step 4 onwards.

15.9.7 How to change the values of SNMP tags

Introduction

Values of SNMP tags from devices are displayed in diagnostic faceplates in the process control. You can change the defaults using the "OPC Scout" utility.

Procedure

1. Select the **Start > SIMATIC > SIMATIC NET > OPC-Scout** command in Windows
   OPC Scout opens.
2. In the tree view, double-click the entry "Server > Local server(s) > OPC SimaticNET".
   The "Add group" dialog box opens.
3. In the "Enter a new 'Group name'" entry field, enter the name for the new group and click "OK".
   The new group is set up in the tree view.
4. Double-click on the newly created group.
   The "OPC Navigator" dialog box opens.
5. Select the "Connections > SNMP" entry in the tree view.
6. Select, for example, "Name of SNMP server (CP 1613 or CP 1623) > System".
7. Choose the items "sysname" and "syslocation" from the list and click the arrow button "-->".
   The selected items are displayed.
   For the "Day" in the faceplate the "sysname" is used, and for the "Description" the "syslocation" is used.
8. Click "OK".
9. Double-click on the value which you want to change and which has at least "W" access rights.
   The "Write value of items" dialog box opens.
10. Enter the plant-specific name and click "OK".
11. Repeat steps 9 and 10 for any other values you want to change.
12. Close the OPC Scout with the menu command **File > Exit**.

15.10 Creating diagnostic screens

15.10.1 Requirements for generating diagnostic screens

Requirements for generating diagnostic screens

The following applies to the generation of diagnostic screens:

- You have completed all configuration tasks, for example, the hardware configuration, CFC and SFC charts, or OS configuration.
- You generated the module drivers and interconnected these with the signal processing blocks in the CFC charts.
  These module drivers are blocks with special functionality which is required for the diagnostics functions in PCS 7.

Options for generating module drivers

You have two options for generating module drivers:

- When compiling the AS:
  The module drivers are then generated automatically during compilation.
- When executing the "Create/update diagnostic screens" function:
  When this function is executed, PCS 7 always checks whether changes have been made to the hardware for which no module drivers were generated. If this is the case, all CPUs for which no module drivers have yet been generated are displayed one after the other in a dialog box. You can select the CPUs for the "Generate module drivers" function in this dialog box.

15.10.2 Principle of Diagnostic Screen Generation

Generating diagnostic screens

To generate diagnostic screens, PCS 7 provides a function that generates all diagnostics overview screens with the associated diagnostic block icons in the required plant hierarchy so that you can navigate easily from an overview picture to all pictures at lower levels of the hierarchy.

Generally, you do not have to make changes because the standard block icons and faceplates of PCS 7 provide you with all necessary information and operator input functions.

After generating the diagnostic screens, the diagnostic structure in the plant hierarchy basically appears as follows:

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Diagnostics					
	AS objects	AS object	DP master system	ET modules	Field devices
				PA slave	
			Rack		
	Network objects				
	PC stations				
	User-specific diagnostics, where configured	where configured	where configured	where configured	where configured

Note

To avoid error messages when generating diagnostic screens, make sure you assign a separate and descriptive name to every hardware component during hardware configuration and avoid assigning identical names.

If you have manually changed the diagnostic screens, make sure that you make a backup copy before deleting, because after deleting and recreating the diagnostic structure, all changes will be lost.

15.10.3 Block Icons and the "@@maintenancetypicals.pdl" File

The "@@maintenancetypicals.pdl" file

The "@@maintenancetypicals.pdl" file contains all the templates for block icons which are used to display the diagnostic information. It is comparable with the "@@PCS7Typicals.pdl" file in which all the standard block icons are saved.

If you execute the "Create/Update Diagnostics Screens" function, PCS 7 automatically uses block icons from this file. This file is installed as standard during the installation of PCS 7.

Changes to the "@@maintenancetypicals.pdl" file

You can adapt block icons to suit your specific needs in the "@@maintenancetypicals.pdl" file. The process is precisely the same as the procedure for adapting standard block icons in the "@@PCS7Typicals.pdl" file.

CAUTION
If you wish to change the standard diagnostic block icons, be sure not to change the original file in any way because all the changes in the original file will be overwritten in the event of an update. Essentially create a new file starting with the fixed name component "@@maintenancetypicals". You can specify the rest of the file name yourself. Insert the required block icons there and perform the changes.

Further information

- Section "Block Icons and the @@PCS7Typicals.pdl File (Page 168)"

15.10.4 How to create/update diagnostic screens

Introduction

When you create/update a screen, all PCS 7 block icons are arranged automatically, starting in the top left-hand corner.

An exception to this is screens in which a rack structure (for example, central rack, ET 200) is displayed. In this case, the block icons for objects are arranged in the order of their slots.

After you update/create a screen, you move the block icons.

Block icons that have been moved remain in their position after the screen is updated.

New block icons are added in the top left-hand corner and cover block icons that have not been moved in the screen.

Deleted block icons are removed from the screen. Their position in the screen remains unoccupied.

Requirements

The configuration must have the following status:

- The hardware configuration with all automation systems and PC stations is complete.
- The network configuration is complete.
- The CFC and SFC charts are compiled.
- OS configuration is complete.
- The operator stations have been compiled.
- The diagnostic structure has been created for all projects of a multiproject.
- The setting for deriving diagnostic screens from the plant hierarchy has been made.
- The setting for deriving the PH names from the diagnostic screens has been made.
- The correct "Display language" is set.
  It is necessary to check the language if you have modified unit or operator texts that relate to block types in the project library.

Procedure

1. Open the SIMATIC Manager and activate the plant view.
2. Select the required hierarchy folder in the tree view.
   - If you wish to create diagnostics screens for the entire project or multiproject, select the project or multiproject in question.
   - If you wish to create diagnostics screens for certain hierarchy folders, select the required hierarchy folder in the maintenance station.
3. Select the **Options > Plant Hierarchy > Create/Update Diagnostics Screens** menu command.
4. If you have already compiled the AS charts, no other dialog box is opened, and the diagnostics screens are created/updated directly.
   Proceed to step 6.
5. If you haven't compiled the AS charts yet, the "Create module drivers" dialog box is opened one after another for every CPU for which this function has not been executed yet.
   Click "OK" in all the dialog boxes to enable the requisite module drivers to be created.

   Note

   If you click "Cancel" in this dialog box, no module drivers are created for this CPU, and the diagnostics screens are not updated!

6. Once the generating process is completed, the "Create/Update Diagnostics Screens" dialog box is opened.
   Click "Yes".
   The function log is displayed in the "WordPad" editor. If error messages appear, rectify the errors and run the function again.
7. Close the "WordPad" editor.

Result

The diagnostics screens are created or updated.

Note

Once the diagnostics screen have been properly created, always execute the "Compile" function for the following operator stations in which diagnostic tags have been changed:

- MS server
- OS server

The picture tree is updated, and you can navigate through all the hierarchical levels of the diagnostic structure in process mode.

Displaying a log of the diagnostics screens

In the SIMATIC Manager select **Options > Plant Hierarchy > Diagnostics Screen Log**.

The diagnostics screen log contains information about the creation of the diagnostics screens.

15.11 Creating user diagnostic screens

15.11.1 How to Create User Diagnostic Screens

Introduction

You create the user diagnostic screens in the hierarchy folders of the user-specific diagnostic structure in the project where the MS server is located. You can create one user diagnostic screen per hierarchy folder.

Requirements

- The user diagnostic structure has been created.
- The CFC charts for the user diagnostic structure have been created.
- A multiproject update is performed for multiprojects.

Procedure

1. Open the plant view in the SIMATIC Manager.
2. In the tree view, mark the hierarchy folder for which you want to create a picture.
3. Select the menu command **Insert > Technological Objects > Picture**.
4. Mark the screen in the detail view and select the menu command **Edit > Rename**.
5. Enter as short a unique name as possible and press Enter.
   The name is applied.
6. Click "OK".
7. Repeat steps 2 through 6 for all the hierarchy folders into which you wish to insert screens.
8. For projects, select the project name, and for multiprojects, select the multiproject name.
9. Select the **Extras > Plant Hierarchy > Create/Update Diagnostic Screens** menu command.

15.12 Integrating SIMATIC PDM into the detailed diagnostics

SIMATIC PDM diagnostics functions

To display extended diagnostic functions of field devices in faceplates, you need the licensed add-on package, SIMATIC Process Device Manager (SIMATIC PDM).

Assigning the diagnostic project in SIMATIC PDM

Assign the current diagnostics project in SIMATIC PDM in order to be able to use the diagnostics function of SIMATIC PDM.

Calling up detailed information

In order to call up detailed information the following requirements must be met:

- SIMATIC PDM must be installed on the engineering station.
- For SIMATIC PDM as of V7.0 the following also applies:
  - The SIMATIC PDM server has been configured in the component configurator on the engineering station.
  - The SIMATIC PDM server is available, therefore the engineering station must be switched on.

Note

The PDM server is only available as of SIMATIC PDM V7.0.

Further information

- *SIMATIC PDM* Online Help
- Manual *SIMATIC PDM; The Process Device Manager*
- Operating instructions for field devices

15.13 Compiling the OS

15.13.1 How to Compile the OS

Procedure

1. In SIMATIC Manager, open the component view.
2. Select the MS server in the tree view.
3. Select the **Compile** command from the shortcut menu.
   The "Compile OS" wizard opens to support you in step-by-step compilation.
   This wizard also opens when you select the **Options > OS > Compile** command.
4. Perform the tasks as described starting at step 4 in "How to Compile Multiple Operator Stations (Page 95)".

Note

When integrating Maintenance Station in a project, select the "area-specific" compilation mode for the multiproject
Further information is available in the section "How to define the compilation mode (Page 94)".

15.14 Creating the Group Display Hierarchy for User Diagnostics Screens

15.14.1 How to Create the Group Display Hierarchy for User Diagnostic Screens

Introduction

You will need to refer to the information in this section if you have added a user-specific diagnostic structure to the diagnostic structure.

Requirement

The WinCC project for the MS server must be opened.

Procedure

1. In the WinCC Explorer tree view select the "Project Editor".
2. Open the shortcut menu and select the **Open** command.
   The OS project editor opens.
3. Select the "Message Representation" tab.
4. Enable the "Create/Update Group Displays" checkbox in the "Group display hierarchy" group.
5. Click "OK".
   The group displays for the hierarchy calculation are automatically inserted into the pictures when the hierarchy is saved, when the OS is compiled or when the OS is downloaded.

15.15 Exporting SNMP tags

15.15.1 How to Export SNMP Tags

Requirement

The "Diagnostics" area has been created in the WinCC project.

Procedure

1. In HW Config, select the OPC server, then select the menu command **Edit > Object Properties...**.
   The "Properties – OPC Server" dialog box opens.
2. Open the "SNMP" tab.
3. Click "Export tags for WinCC".
   The system generates all tags and messages for the SNMP modules.
4. Click "OK".
   You have completed the configuration.

15.16 Complete export - exporting data from all components

15.16.1 Complete export of data

Complete export

Use this function in process control to export ID data from all the components with diagnostics functionality (for example, field devices, PCs, AS components, network components).

The data from all the components with diagnostics functionality is exported to the export file "@XML_Export.sml".

The storage location for the export file is set by the system as default.

A copy can be stored automatically in a configured storage path.

Pre-assigned storage path

The export file is saved in the project folder of the MS server.

In the case of a plant configuration with an MS server and a standby MS server, the export file is saved in the project folder in the "AssetExport" folder of the MS Server that is the master at the time of the initiation of the export.

Configured storage path

The configured storage path can be configured as an absolute or relative path.

Path	Example of a storage path	Storage path
Absolute path	D:\folder	On the MS server, which is the master at the time of the initiation of the export, in the configured path
Relative path	\\computer name\drive\folder	On the specified computer in the configured path

Note

We recommend that you configure the storage path as a relative path for a plant configuration with an MS server and a standby MS server. This will ensure that the export file is always stored in the same "place", regardless of which MS server is the master at the time the export is initiated.

Further information is available in the section titled "How to define the storage path for the export file (Page 330)".

Further information

- *Process Control System PCS 7; OS Process Control* manual

15.16.2 Overview of configuration tasks

Overview of the configuration steps

Preparing for a complete export involves the following step:

Step	What?
1	The storage path is specified for the export file. (Page 330)

15.16.3 How to configure the storage path for the entire export file

Introduction

The storage path for the export file is set via the start value for the "@ExportPath" tag.

Requirement

The WinCC project for the MS server must be opened.

Procedure

1. Select the "Tag Management" editor from the tree view in WinCC Explorer.
2. Select the "Internal tags" object.
3. Open the context menu and select the **New Tag...** command.
   The "General" tab of the "Tag Properties" dialog box opens.
4. Enter "Name:" enter the name "@ExportPath."
5. Go to the "Data type:" drop-down list box and select the "Text tag 16-bit character set" entry.
6. Select the "Limits / Logging" tab.
7. Select the "Start value" check box.
8. As a start value, enter the path name for the export file.
   For further information, refer to the section "Complete export of data (Page 329)".
9. Click "OK".

Result

The storage location is set up.

15.17 Individual export - exporting individual component data

15.17.1 Overview of individual export

Introduction

Use this function in process control to export data (such as ID data or alarm list) from a component with diagnostics functionality (for example, field device, PC, AS component, and network component) for various applications.

Applications

You perform an individual export for example in the following cases:

- Provision of data in a file.
  For more information, refer to the section titled "Exporting data to a file (Page 331)".
- Provision of data in a file for the WinCC add-on "Alarm Control Center".
  For more information, refer to the section titled "Exporting data for the Alarm Control Center (Page 335)".

Each application corresponds to one export target.

15.17.2 Exporting data to a file

15.17.2.1 Storage path for the export file

Default storage path

The export file is stored in a standard storage path.

Standard storage path for the export file	Description
D:\wincc	Name and path of the WinCC project
Asset export	Default folder: "AssetExport"
types	Subdirectory (user-definable name)
OUT	Default folder: "OUT"

Subdirectory

If you wish to configure a subdirectory in the standard storage path, then create the tag @ASSET_EXPORT_<n>_DIR.

The name of the subdirectory is specified as the start value of the tag, for example "Maintenance".

Further information is available in the section titled "How to configure the storage path for the export data (Page 333)".

15.17.2.2 Name of the export target

Specify the name for the export target

Create the @ASSET_EXPORT_<n>_NAME tag for the name of the export target.

The name of the export target is specified as the start value of the tag, for example "Electrician".

For further information on how to create tags, refer to the section "How to configure the name of the export target (Page 334)".

15.17.2.3 Name of export file

Structure of the export file name

The name of the export file is structured as follows:
"<Tag_name>.<Asset_ID>_YYYY-MM-DD_HH_MM_SS.XML"

Structure of the file name	Description
<Tag_name>	Configured component designation
<Asset_ID>	ID number for the component:
YYYY-MM-DD_HH_MM_SS	Date and time when the component data was exported
xml	File type

15.17.2.4 Overview of configuration tasks

Overview of the configuration steps

Preparing for an individual export involves the following steps:

Step	What?
1	The storage path is specified for the export file. (Page 333)
2	The name is specified for the export target. (Page 334)

15.17.2.5 How to configure the storage path for the export file

Introduction

If you want to change the standard storage path which determines the place where the export file is saved, configure a subdirectory in the standard storage path.

Requirement

The WinCC project for the MS server must be opened.

Procedure

1. Select the "Tag Management" editor from the tree view in WinCC Explorer.
2. Select the "Internal tags" object.
3. Open the context menu and select the **New Tag...** command.
   The "General" tab of the "Tag Properties" dialog box opens.
4. Enter "Name:" the tag name "@ASSET_EXPORT_<n>_DIR" in the input box.
   "n" is an index. It begins with "1". The index name is allocated continuously, e.g. "@ASSET_EXPORT_1_DIR"
   The index is in direct connection with the index of the "@ASSET_EXPORT_<n>_NAME" tags.

   Note

   Ensure that the name of the tag is spelled correctly.

5. Go to the "Data type:" drop-down list box and select the "Text tag 16-bit character set" entry.
6. Select the "Limits / Logging" tab.
7. Select the "Start value" check box.
8. Enter subdirectory as the start value.
   For example, "FOLDER"
9. Click "OK".
10. Repeat steps 1 to 9 for other folders.

    Note

    Subdirectories in different indices may have identical names. The files are saved in the same directory.

Result

The storage path is set.

15.17.2.6 How to configure the name of the export target

Introduction

The name of the export target appears in the "Request via" drop-down list in the faceplate in "Maintenance" view. Define the name of the export target in a tag.

Requirement

The WinCC project for the MS server must be opened.

Procedure

1. Select the "Tag Management" editor from the tree view in WinCC Explorer.
2. Select the "Internal tags" object.
3. Open the context menu and select the **New Tag...** command.
   The "General" tab of the "Tag Properties" dialog box opens.
4. Enter "Name:" the tag name "@ASSET_EXPORT_<n>_NAME" in the input box.
   "n" is an index. It begins with "1". The index name is allocated continuously, e.g. @ASSET_EXPORT_1_NAME

   Note

   Ensure that the name of the tag is spelled correctly.

5. Go to the "Data type:" drop-down list box and select the "Text tag 16-bit character set" entry.
6. Select the "Limits / Logging" tab.
7. Select the "Start value" check box.
8. Enter a name as the start value.
   For example, "ELECTRIC"
9. Click "OK".
10. Repeat steps 1 to 9 for other names.

Result

The name of the export target is configured.

15.17.3 Exporting data for the Alarm Control Center

15.17.3.1 WinCC add-on "Alarm Control Center":

Alarm Control Center

The Alarm Control Center has a modular design. With the available options, it can be customized for everything from stand-alone solutions to company-wide communication solutions.

The Alarm Control Center (ACC) offers the following functions:

- Forwarding of messages to specific recipients
- Integrated shift and personnel management for time-dependent delivery of messages to different persons
- Extensive escalation system for reliable delivery of messages even when individual recipients cannot be reached
- Network-wide operation and configuration through Web capability

Forwarding of messages to specific recipients

The following messages from an individual component can be forwarded:

- Diagnostic messages
- Messages about operations
- Messages about maintenance requirements

Recipients of messages that can be sent automatically via the ACC include, for example:

- SMS to mobile telephone
- Pager
- Voice output to a telephone
- E-mail
- LAN message to PC
- PDA or Webpad (MOBIC)

15.17.3.2 Overview of configuration tasks

Overview of the configuration steps

The export of data to the Alarm Control Center involves the following steps:

Step	What?
1	The storage path is specified for the export file. (Page 333)
2	The name is specified for the export target. (Page 334)
3	The trigger tag is specified for the script. (Page 337)
4	A script is created to transfer data to the Alarm Control Center (Page 338)
5	The license number is configured. (Page 340)
6	Integrating data into the Alarm Control Center (Page 340)
7	Configuration of the Alarm Control Center (Page 341)

15.17.3.3 Storage path for the export file

Default storage path

The export file is stored in a standard storage path.
For further information, refer to the section "Storage path for the export file (Page 331)".

Subdirectory

If you wish to define a subdirectory in the default path, create the tag @ASSET_EXPORT_<n>_DIR.

The name of the subdirectory is specified as the start value of the tag, for example "ACC".

Further information is available in the section titled "How to configure the storage path for the export file (Page 333)".

15.17.3.4 Name of the export target

Specify the name for the export target

Create the @ASSET_EXPORT_<n>_NAME tag for the name of the export target.

The name of the export target is specified as the start value of the tag, for example "ACC_Export".

For further information on how to create tags, refer to the section "How to configure the name of the export target (Page 334)".

15.17.3.5 How to configure the trigger tag for the global script

Introduction

Data is transferred to the Alarm Control Center by means of a global script. This global script uses a trigger tag.

In the following we create the trigger tag "@ASSET_EXPORT_FINISHED".

Requirement

The WinCC project for the MS server must be opened.

Procedure

1. Select the "Tag Management" editor from the tree view in WinCC Explorer.
2. Select the "Internal tags" object.
3. Open the context menu and select the **New Tag...** command.
   The "General" tab of the "Tag Properties" dialog box opens.
4. Enter "Name:" the trigger tag "@ASSET_EXPORT_FINISHED".
5. Select "Data type:" from the drop-down list and select the entry "Integer unsigned 32 Bit".
6. Click "OK".

15.17.3.6 How to create a global script for data transfer to the Alarm Control Center

Introduction

A global script is used to transfer data from a component to ACC. You create the global script in WinCC Explorer in the "Global Script" editor.

An example script is used to create the global script.

You can find the example script:

- In the section "Example script for data export to Alarm Control Center (Page 341)"
- On the DVD of the SIMATIC Maintenance Station in the directory "Additional_Products / ACC_integration / Scripts"

Note

Before using the example script, check the file names and path specifications configured in it against the real directory structure of the PC that is used.
Change them if necessary.

Requirements

The following tags are used for the "Alarm Control Center" export target and have to be created in WinCC:

- "@ASSET_EXPORT_<n>_NAME".
  The example script uses "ACC_Export" for the name of the export target.
- "@ASSET_EXPORT_FINISHED"
- "@ASSET_EXPORT_<n>_DIR"
  The example script uses "ACC_Export" for the name of the subdirectory.

Procedure

1. In the WinCC Explorer tree view, select the "Global Script" editor.
2. Select the shortcut menu command **Open VBS Editor**.
3. In the navigation window of the VBS Editor, select the "Actions" tab.
4. Select the shortcut menu command **New > Action**.
5. Copy the code of the example script from the section "Example script for data export to Alarm Control Center (Page 341)" and insert it between the code lines "Function action" and "End Function".
   After completing the insertion, make sure that the code lines are not duplicated.
6. Select **File > Save** to save the action.
   Since this is a new action, the "Save As" dialog box opens.
   Enter a name for the action, for example "ACC_Send_Messages".
7. The tag "@ASSET_EXPORT_FINISHED" is selected as a trigger for the global script.
   Select the menu command **Extras > Info / Trigger**.
   The "Properties" dialog box opens.
8. Select the "Trigger" tab.

9. Select the entry "Tag" in the navigation window.
10. To do this, click "Add...".
    The "Add trigger" dialog box opens.
    Enter the name "@ASSET_EXPORT_FINISHED" in the "Tag name" input box.
11. Click "Add".
    The tags in the "trigger name" table are adopted.
    Alternatively, you can use the "..." button to open a selection dialog and select the tag from it.
12. Click "OK".
    The "Add trigger" dialog box closes.
13. Click "OK".
    The "Properties" dialog box closes.
14. Select **File > Save**.
    The action is saved.
15. Select **File > Exit**.
    The VBS editor is closed.

Result

The required configurations for data export to the Alarm Control Center are now implemented.

Note

If you use the example script, no additional directories have to be created manually. The subdirectories configured in the example script and in the optional tag "@ASSET_EXPORT_<n>_DIR" are created automatically when the global script is started for the first time.

15.17.3.7 How to configure the license number of the Alarm Control Center for the export function

Introduction

The license number of the Alarm Control Center (ACC) is required as a parameter in the export file for an individual export. The license number must therefore be retrieved from the Alarm Control Center and configured in the maintenance station in the file "logininfo.xml".

The "logininfo.xml" file is supplied as an example on the DVD of the SIMATIC Maintenance Station in the directory "Additional_Products / ACC_integration / LoginInfo".

Requirement

- The license number of the Alarm Control Center is known.
  You can find the license number in the "System Overview" of the Alarm Control Center under "Coupling Agents" and the entry "OpenInterface".

Procedure

1. Navigate in Windows Explorer on the DVD of the SIMATIC Maintenance Station to the directory "Additional_Products / ACC_integration / LoginInfo".
2. From the DVD, copy the subdirectory "ACC" as a subdirectory to the local WinCC project directory of the maintenance station under "<wincc_project_name>".
   By default the WinCC project is located in the directory of the corresponding S7 project in the subdirectory "wincproj / <wincc_project_name>".
   The path "<wincc_project_name> / ACC" is used for the XML file in the example script.
3. Open the "logininfo.xml" file with an XML editor such as Windows Notepad.
4. Enter the license number of the Alarm Control Center in the "<License>" parameter. The format in the example file is specified by default.
5. Select the menu command **File > Save**.
6. Select the menu command **File > Exit**.

Result

The license number of the Alarm Control Center is now configured for individual export.

15.17.3.8 Integrating data into the Alarm Control Center

Integrating data into the Alarm Control Center

For additional information about the integration of the data in Alarm Control Center please refer to the documentation of Alarm Control Center.

15.17.3.9 Configuration in the Alarm Control Center

Rules

The following rules have to be observed for configuration in the Alarm Control Center:

- The coupling agent "OpenInterface" with "ACC Open Interface Runtime license (CAL)" is required.
- The send channel "ACC LAN Message" is preferred. The router must already be set up.
- The "Administrator" user must be set up for the channel "ACC LAN Message". Set "localhost" as the phone number.

15.17.3.10 Use in an MS multiple station system

Use in distributed systems

If the PCS 7 maintenance station is used as a multiple station system, the ACC agent must be installed on the MS server.

The Alarm Control Center server can be installed on a different PC station.

Further information

For additional information on the ACC agent and the Alarm Control Center server, refer to the *Alarm Control Center* documentation.

15.17.3.11 Example script for data export to the Alarm Control Center

Introduction

The following global script can be used to export data of a component for the Alarm Control Center:

Note

Before using the example script, check the file names and path specifications configured in it against the real directory structure of the PC that is used and adapt them if necessary.

The following files and directories are used in this example script:

- The directory "<WinCC_project_directory> / AssetExport / ACC".
  This directory is created automatically when the script is started for the first time.
  The lower-level subdirectory "OUT" is also created in the process.

You can find further information about using the example script in the section "How to create a global script for data transfer to the Alarm Control Center (Page 338)".

The example script is supplied on the DVD of the SIMATIC Maintenance Station in the directory "Additional_Products / ACC_integration / Scripts".

Example script

```
Option Explicit
Function action

' FilesystemObject doc: http://msdn2.microsoft.com/en-
us/library/hww8txat.aspx
' Files Object doc: http://msdn2.microsoft.com/en-
us/library/18b41306.aspx
' Folder Object doc: http://msdn2.microsoft.com/en-
us/library/1c87day3.aspx

Dim ExportTarget
Dim ServiceEinheit
Dim loginInfoPath
ServiceEinheit = "9999"
ExportTarget = "ACC"
LoginInfoPath = HMIRuntime.ActiveProject.Path & "\ACC\logininfo.xml"

Dim fso
Dim folder
Dim fc
Dim f1

' activate debugger
Dim a
'a = 1 / 0


Set fso = CreateObject("scripting.filesystemobject")
Set folder = fso.GetFolder(HMIRuntime.ActiveProject.Path &
"\AssetExport\" & ExportTarget & "\Out\")
Set fc = folder.Files

On Error Resume Next

For Each f1 In fc
    If Right(f1.name, 4) = ".xml" Then

        'debug script for Interlink.dll
        Dim il
        Dim job
        Dim xmlfile
        Dim MessageText

        xmlfile = f1.Path


        If Len(ServiceEinheit) <= 0 Then ServiceEinheit = "9999"


''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
        Dim objXML
        'Set objXML = CreateObject("MSXML2.DOMDocument.6.0")
        Set objXML = CreateObject("MSXML2.DOMDocument.3.0") '
delivered with IE 6.0SP1, see http://support.microsoft.com/kb/269238
```

```
        ' check structure of document while loading
        objXML.validateOnParse = True

        ' Load document
        If Not objXML.Load(xmlfile) Then
            ' Error while loading
            HMIRuntime.Trace "Error while loading the document." &
vbCrLf & vbCrLf _
            & "Reason: " & objXML.parseError.reason & vbCrLf _
            & "line: " & objXML.parseError.Line
            Exit Function
        Else
            Dim child

            MessageText = "Maintenance Request: "

            Set child =
objXml.documentElement.selectSingleNode("/Document/b2mml:EquipmentIn
formation/b2mml:Equipment/b2mml:EquipmentProperty/b2mml:Value/b2mml:
ValueString[../b2mml:Key='Name']")
            MessageText = MessageText & " Tag=" & child.text
            'HMIRuntime.Trace child.NodeName & " = " & child.text &
vbNewLine

            Set child =
objXml.documentElement.selectSingleNode("/Document/b2mml:Maintenance
Information/b2mml:MaintenanceRequest/b2mml:Problem")
            MessageText = MessageText & " / Problem=" & child.text

            Set child =
objXml.documentElement.selectSingleNode("/Document/b2mml:Maintenance
Information/b2mml:MaintenanceRequest/b2mml:Requestor")
            MessageText = MessageText & " / Requestor=" & child.text

            Set child =
objXml.documentElement.selectSingleNode("/Document/b2mml:Maintenance
Information/b2mml:MaintenanceRequest/b2mml:Status")
            MessageText = MessageText & " / Status=" & child.text
            HMIRuntime.Trace "MessageText = " & MessageText &
vbNewLine
        End If


''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''

        'Create and initialize Interlink and Job helper objects
        Set il = HMIRuntime.DataSet("il").Value
        'Set job = HMIRuntime.DataSet("job").Value ' always create a
new job object

        If IsEmpty(il) Then
            Set il = CreateObject("FSP3Interlink.Interlink")

            'Load login info from File
```

```
            Dim file
            Dim logininfo
            Set file = fso.OpenTextFile(LoginInfoPath)
            loginInfo = file.ReadAll()

            'chose connection method (default is dcom)
            Dim ComputerName
            Set ComputerName = HMIRuntime.Tags("@LocalMachineName")
            'Set ComputerName = HMIRuntime.Tags("@ServerName")
            ComputerName.Read
            'il.AddGateway "tcp://localhost", 5, loginInfo, nothing,
false
            'il.AddGateway "soap://FSP3SERVER/fsp3", 5, loginInfo,
nothing, false
            'il.AddGateway "dcom://" & ComputerName.Value, 5,
loginInfo, Nothing, False
            il.AddGateway "dcom://localhost", 5, loginInfo, Nothing,
False

            HMIRuntime.DataSet.Add "il", il
        End If

        If IsEmpty(job) Then
            Set job = CreateObject("FSP3Interlink.Job")
            HMIRuntime.DataSet.Add "job", job
        End If

        'Prepare Job object
        job.MsgText = MessageText
        job.AddAlarmGroupToCall(ServiceEinheit)

        'Submit Job
        Dim sHost
        Dim sJobID
        sHost = ""
        sJobID = il.SubmitJob("", "", job, sHost)

        HMIRuntime.DataSet.Add "host", sHost
        HMIRuntime.DataSet.Add "jobid", sJobID

        ' rename file to prohibit processing the same file again
        fso.MoveFile f1.Path, f1.Path & ".bak"
    End If
Next


End Function
```

15.18 Changes to the configuration

15.18.1 What to Do after Making Changes to the Hardware Configuration

Introduction

Changes in the hardware configuration of the engineering system affect the displays in the diagnostic screens. The diagnostic screens must be generated or created.

Basic procedures

If you wish to use the "Compile changes" and "Download changes" functions when making changes in the hardware configuration (such as new modules or adding an IM), we recommend the following procedure:

- Add hardware.
- Compile CFC charts with module drivers.
- Create/update diagnostics screens.
- Compile the OS with the scope "Changes".
- Download the OS with the scope "Changes"
  If the MS server is on a separate PC station, you must download the MS server with the scope "Changes".

Adding components

When you add components, PCS 7 creates the new folders with the associated diagnostic screens. The block icons for the new components are each inserted in the overview pictures behind the existing block icons.

Deleting components

Components are deleted accordingly: PCS 7 deletes the corresponding folders and diagnostics screens. When you delete block icons from the overview pictures, spaces are created between the block icons since the position of the previously inserted block icons is not changed.

15.18.2 Procedure where there are changes in the software configuration

Change the standard message server for the "Alarms" component

If the assigned standard message server for "Alarms" component is changed, in the OS client in a multi-user system configuration, the MS server then has to be compiled.

You can find further information about this in the section "How to Assign the Standard Servers (Page 349)" and "How to Compile the OS (Page 326)".

Change the screen resolution

If the screen resolution in the OS project editor in the "Layout" tab in the group "Available layouts:" is changed, the next time the "Create/Update Diagnostics Screens" is called, the available overview screen is renamed and a new overview screen that corresponds to the new screen resolution is set up. A respective message is included in the log of the function "Create/Update Diagnostics Screens". This also provides the new name of the former overview screen.

If you have manually changed the overview screen, you can manually carry out the changes in the current overview picture by copying from the former overview screen.

16 Server data

16.1 Downloading Server Data

16.1.1 Generating and Downloading of Server Data

Server data

The server data include all the important information for the OS clients. These server data are automatically generated when the OS server is 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 are stored in a special file. The name of the file has the following structure:

[name of project]_[name of server].pck

Central archive server

If you use a central archive server in your project, allocate the server data as follows:

- The OS clients require the server data of all OS servers from which they require data.
- The OS clients also require the server data of the central archive server so that they can read the process values and messages from the archives of the central archive server and, for example, display the process values in online trend controls.

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.

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 the section "Interconnection of Tags of Different OS Servers (Page 283)".

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 data can 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. Select the **Assign OS Server** command from the shortcut menu.
   The "Assigning OS-Server for [name of OS]" dialog box opens.
4. Activate 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 process is started and the message dialog box with progress display is opened.
6. Once the download process has been successfully completed, click "OK".
7. Repeat steps 2 to 6 for all OS clients and OS servers that require server data.

16.2 Determining the Standard Server for OS Client

16.2.1 How to Assign the Standard Server

Introduction

You assign standard servers the components "Alarm", "SSM (Split Screen Manager)" and "User Archive" for OS clients.

Note

Always assign the same OS server as the standard server to OS clients with the same server data.

Note

When using a reference OS, you only assign standard servers the base OS.

Requirement

- The server data are 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 component in the "symb. computer name" column.
3. Select the standard server from the drop down list box.
   The drop down list box contains the symb. computer names of all server data loaded on the client.
4. Repeat steps 2 and 3 for all components.
5. Click "OK".

Result

Standard server for the "Alarms" component:

- For operations which are carried out on an OS client, operating messages are generated and saved on the standard server.

Standard server for the "SSM" component:

- Trend groups that are composed on an OS client are saved on the standard server.
  If no standard 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 standard server and its redundant partner.
  If no standard 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.

Standard server for the "User Archive" component:

- The data are stored in the user archives on the OS servers.

Downloading and Activating a Project

17

17.1 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
Complete download:	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.

17.2 Requirements for Downloading an Entire Project

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:

Step completed	Additional information
Hardware configuration generated and loaded in HW Config	Manual *Process Control System PCS 7; Engineering System*
Network connections configured and loaded in NetPro	Section "Configuring network connections for an OS (Page 48)" Manual *Process Control System PCS 7; Engineering System*
Configuring the hardware components in the component configurator	Section "How to check and change the configuration (Page 50)"
Carry out the ES configuration, for example create CFC charts or SFC charts in the SIMATIC Manager	Manual *Process Control System PCS 7; Engineering System*
Download the ES data to the automation systems	Manual *Process Control System PCS 7; Engineering System*
Compiling the OS servers without error messages	Section "Compiling the OS (Page 92)"
Perform the OS configuration, for example create process pictures or OS reports	Section "Overview of the reports with the report designer (Page 258)"
Download the server data via the assignment of OS servers This is only necessary if you use server-to-server communication.	Section "Creating and Downloading Server Data (Page 347)"

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:

Step completed	Additional information
Create the hardware components in HW Config There is no need for an Ethernet card for OS clients.	Section "Overview of Hardware Configuration (Page 37)" Manual *Process Control System PCS 7; Engineering System*
Network connections configured and loaded in NetPro There is no need for an S7 connection for OS clients.	Section "Configuring network connections for an OS (Page 48)" Manual *Process Control System PCS 7; Engineering System*
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 50)"
Download the server data via the assignment of OS servers	Section "Creating and Downloading Server Data (Page 347)"

17.3 Background Information on Compiling and Downloading an Entire Project

Introduction

A project is downloaded in SIMATIC Manager with the central "Compile and Download Objects" function. PCS 7 provides the "Compile and Download Objects" dialog for this task. 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. This is where you make all required settings for compiling and downloading from a central location. In addition, you specify in this dialog box whether the entire project or individual operator stations are to be compiled and downloaded.

Special note regarding downloading 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 note regarding downloading 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 note regarding downloading 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.

Storing pictures and scripts

The scripts and pictures are automatically copied to the following directories on the OS client:

- Pictures: \...\GraCS
- Scripts: \...\Library

17.4 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. Mark the multiproject and select the **PLC > Compile and download objects** command.
   The "Compile and download objects" dialog box opens and shows all objects according to the component view.
3. Click the 'plus' symbol to reveal the lower-level objects.
4. In the "Download" column, clear the checkboxes for all the operator stations which you don't wish to download.
5. Mark the OSs you wish to download in the tree view.
   The "Edit" button becomes activated.
6. Click the "Edit" button.
7. If you have marked an OS server, the "Settings: Compile OS" dialog box is opened.
   Set the requisite parameters in the individual steps and click "Apply".
   The "Settings: Download OS" dialog box is opened. Proceed to step 8.
   Further information is available in the section "How to Compile Multiple Operator Stations (Page 95)".
8. If you have marked an OS client, the "Settings: Download OS" dialog box is opened.
9. If necessary, select the path to the target OS computer in the "Settings: Download OS" dialog box.
   The path previously set in the object properties for this OS is always shown in this dialog box.

10. Enable the checkbox marked "The entire WinCC project" if you wish to download the entire project to the target computer.
    Enable the "Changes" checkbox if you have configured changes and only want to download these changes.

CAUTION
If you cancel the "Download changes" function, only a complete download will then be possible.

Note

Once you have carried out the "complete download" function, the "Changes" checkbox is automatically activated so as to prevent complete downloading being performed inadvertently.

11. Click "OK".
12. Repeat steps 5 to 11 for all the other operator stations which you wish to download.
13. Click "Start".
    The download operation is started, and a progress bar informs you about the current status of the download operation.

17.5 How to Download a Single OS

Introduction

The "Download entire project" and "Download changes" functions for a single OS are performed the same way in principle.

Procedure

1. In SIMATIC Manager, open either the component view or the plant view.
2. Select the object to download in the tree view, and then select the **PLC > Download** command.
   The "Compile and download objects" dialog box opens.
3. Define the scope of data which you wish to download:
   - Enable the option marked "The entire WinCC project" if you wish to download the entire OS.
   - Enable the option marked "Changes" if you wish to download the changes.

   Note

   Once you have carried out the "complete download" function, the "Changes" checkbox is automatically activated so as to prevent complete downloading being performed inadvertently.
4. Click "OK".
   The download starts.

17.6 How to Activate a Project

Introduction

The following description applies to activating a project on an OS server and on an OS client.

Software requirements

The OS software has been installed on the operator station you want to use for process mode:

If you want to install the following operator stations...	… then select the following option in the PCS 7 installation:
OS server	OS server
OS client	OS client
OS single station system (OS server and OS client functions on one PC station)	OS single station

Procedure

1. Select the **Start > SIMATIC > WinCC > WinCC Explorer** menu command on the OS to be activated.
   WinCC Explorer opens.

   Note

   Activate the operator stations directly on the associated computer. It is not possible to activate any OS on the Engineering Station.

2. Select the **File > Open** command.
3. Go to the ".../[project path]/[name of OS]" folder in your file system which contains the corresponding "*.mcp" file.
4. Click "Open".
   The project opens.

   Note

   The last project you opened is recovered if you open a new session of WinCC Explorer.

5. Select the **File > Activate** command.
   Process mode is activated.

17.7 How to Activate a Project on the Central Archive Server

Introduction

The following description applies to activating a project on the central archive server.

Software requirements

The OS software has been installed on the operator station you use for process mode:

If you want to install the following operator stations...	… then select the following option in the PCS 7 installation:
Central archive server	Central archive server

Procedure

1. Select the **Start > SIMATIC > WinCC > WinCC Explorer** menu command on the OS to be activated.
   WinCC Explorer opens.
2. Select the **File > Open** command.
3. Go to the
   ".../[project path]/[name of OS]" folder in your file system which contains the corresponding "*.mcp" file.
4. Click "Open".
   The project opens.

Note

The last project you opened is recovered if you open a new session of WinCC Explorer.

5. Select the **File > Activate** command.
   Process mode is activated.

Note

Activation of the central archive server is always carried out on the central archive server.

Downloading changes to a project

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18.1 Background Information on "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

CAUTION
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 perform a full download.

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 to: activate process mode on all OS servers from which the OS client receives 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 has been downloaded successfully, 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 configured the download of changes from operator stations as a reference OS onto a base OS, then you must download all the operator stations (base OS and reference OS).

NOTICE

A new reference operator station changes-only download can only be performed once **all** reference operator stations have first performed a changes-only download.

If you don't do this for a reference OS, you will have to perform a complete download of this reference OS.

18.2 Downloading changes

Overview of Changes

The following is an overview of the changes you can make and then transfer with the "Download changes" function.

- Changes in the plant view (Page 363)
- Changes in the component view (Page 364)
- Changes in CFC/SFC Charts (Page 364)
- Changes in Blocks and Block Instances (Page 365)
- Changes in WinCC Explorer (Page 366)

18.3 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
- Changing of the plant hierarchy level for the OS area
- Changing of the AS assignment and passing the change on to all lower-level objects
- Changing of the OS assignment and passing the change on to all lower-level objects
- Renaming, insertion, deletion and changing of OS pictures
- Renaming, insertion, deletion and changing of OS reports

18.4 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 links are not removed until a complete compilation with memory reset is performed.

Note

OS / AS communication is briefly interrupted when an S7 program is renamed, as the corresponding connection names must be updated in the database: "old" connection names are deleted and new names are registered.

18.5 Changes in CFC/SFC Charts

Downloading changes without stopping the OS

You can download the following changes to charts 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

18.6 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 CFC charts
- 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

NOTICE
The AS must be stopped when a change is made to a block I/O of a block type.

18.7 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 (Tag Logging)
- Configuration of reports (Report Designer)
- Programming of script (Global Script)
- Editing of text library
- Setting of user permissions
- Configuration of user archives
- Setting of time synchronization
- Setting of lifebeat monitoring
- OS Project Editor
- Horn
- Changes in process pictures and associated scripts
- Changes in SFC display properties

18.8 Full download

Downloading the full program and stopping the OS

In certain cases, you lose the option to select the "Download changes" function.

NOTICE
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. • Change to the OS name • Entire OS compilation • Change to the path that leads to the destination computer • Change to the master OS - standby OS assignment • Change to the configuration of redundant OS servers • Change to the OS project properties • Change to 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

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19.1 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

NOTICE
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 Online Trend Control. • Communication between the OS and the AS can be simulated. Requirement: OS / AS communication requires named S7 connections. Further information is available in the section "Configuring network connections for an OS (Page 48)". • Note that operations which you carry out in the OS simulation have an impact on your process.

19.2 How to Start 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 **Options > OS > Start OS simulation** menu command
   The OS configuration data are saved to a temporary folder. The process mode of the selected OS is simulated based on these data.

Note

When you restart a simulation, the data in the temporary folder are updated.

While the OS is in simulation mode, you can make no changes to the configuration data of the OS.

Using Additional Tools and Editors 20

20.1 The "Text Library" editor in the WinCC Explorer

20.1.1 Text Library

Introduction

The text library is an editor in the 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 text 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:

Edit the corresponding languages in order to ensure that the unit and operator texts in process pictures are output in the language set by the operator when the system is in process mode.
Further information is available in the section "How to change the unit and operator texts in the foreign languages (Page 374)".

Define the same language setting in process mode for the OS client and the OS server so as to ensure that the faceplate texts appear in the same language.
Further information is available in the section "How to Set the Language in the WinCC Explorer (Page 36)".

Managing multilingual texts in the "Text Library" editor

In order to switch languages in process control, all the texts must be saved in the Text Library in the appropriate languages.

There is further information available on this in the section "How to Manage Multilingual Texts (Page 99)".

20.1.2 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:

The compiler always uses the text library column which contains the language set in SIMATIC Manager as "Default language for display devices" as reference when it compiles OS data.
Further information is available in the section: "How to set the language in SIMATIC Manager (Page 35)".

Example

An operator text is defined as follows, for example: "S7_String0 = Aus" (off).

- German is the "standard language for display devices" in the SIMATIC Manager: When the OS is compiled, the text "Aus" (off) is entered in all five columns of the Text Library.
- 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" • if the entry "Off" is already present, • no new entry is created
English	• the reference column is "English" • the 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 the languages, and manual changes are lost.

Rule

The texts in the Text Library in WinCC Explorer are automatically entered by PCS 7. Only change the texts if you have altered the unit and operator texts. In this case, take note of the following:

CAUTION
Whenever you re-compile the OS, you may not change the "standard language for display devices" in the SIMATIC Manager. In this case, entries which have already been compiled may be overwritten.

20.1.3 How to Change the Unit and Operator Texts in the Foreign Languages

Requirements

- The unit and operator texts in SIMATIC Manager have been adapted in the block types.
- The unit and operator texts in SIMATIC Manager have been adapted in the block instances.
- The OS has been compiled in SIMATIC Manager.

Procedure

1. Select the "text Library" editor in the WinCC Explorer tree view, and then select the **Open** command from the shortcut menu.
   The "Text Library" editor opens.
2. Select the **Edit > Find** command.
3. In the "Find what:" input box, enter the unit and operator text for the block type.
4. Click "Find next".
   The table field which contains the specified term is displayed in the text library.
5. Enter the desired translations in the foreign language columns.
6. Press the ENTER key.
   The program saves your text.
7. If you want to translate several unit and operator texts, repeat steps 3 to 6.
8. Select the menu command **File > Exit**.

Editing entries in an external program

Note

You can also edit the text library entries in an external program such as MS Excel.

1. Export the data to a *.csv file using the **File > Export...** command.
2. Edit the data.
3. Select the **File > Import** command.
   The program imports the data you edited.

20.2 WinCC archive configuration tool

Introduction

The WinCC archive configuration tool is an Excel add-in that helps you create Tag Logging archives quickly and easily. You can also read out and edit the existing archives. Large quantity frameworks can be handled with ease using the WinCC Archive Configuration Tool.

Requirement

- Microsoft Excel is installed.

Installation

The WinCC Archive Configuration Tool is available on the PCS 7 Toolset DVD at: "20_WinCC__Vx.y\WinCC\setup\Products\WinCCArchive\Setup.exe".

Follow the Setup instructions for the installation.

Help for the WinCC Archive Configuration Tool

Select **Start > SIMATIC WinCC > Tools > WinCC Archive Configuration Tool**.

20.3 Operator control and monitoring of the process mode via the Internet/Intranet

PCS 7 OS Web option

The PCS 7 OS Web option enables you to use OS operator control and monitoring functions over the Internet or Intranet in process mode. You will need the following components:

- PCS 7 Web Server:
  The PCS 7 Web Server is operated on an OS multi-user system as standard OS client with PCS 7 Web Server functionality. All pictures and scripts are saved to this server for their visualization and execution on the WebNavigator client.
  The PCS 7 Web Server is operated on an OS single station system as an OS Single Station with PCS 7 Web Server functionality or Engineering Station, and as OS on a PC station with PCS 7 Web Server functionality.
- WebNavigator Client:
  The WebNavigator Client is an Internet-capable computer on which Internet Explorer is installed. In addition to this, the components that are required for operating the WebNavigator Client must be installed.
  The user can log on to the WebNavigator Client and use a TCP/IP connection to access the data of the PCS 7 Web Server. The user interface displayed in Internet Explorer matches the appearance of an OS client with an overview area, work area, and key area.

Functions of the WebNavigator Client

The WebNavigator Client provides the following functions:

- 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

Note

Not all functions are available. Information on function availability is available in the *Process Control System PCS 7; OS Web Option* manual.

Further information

- *Process Control System PCS 7; OS Web Option* manual

20.4 Programming with scripts

20.4.1 Function of Global Script

Introduction

A global script allows you to program actions and functions, which can be 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 with 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 dynamic display of graphic objects in the Graphics Designer

Further information

- Online Help for *WinCC Information System*

20.4.2 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.

NOTICE
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 wish 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

Further information

- Online Help for *WinCC Information System*

20.4.3 Global Script - Programming with VB Script

Introduction

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

Further information

- Online Help for *WinCC Information System*

20.4.4 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.

Further information

- Online Help for *WinCC Information System*

20.5 Overview of Additional Tools

20.5.1 Additional Tools for OS

Diagnostic tools

The PCS 7 OS offers you a number of additional diagnostic tools.

You can find additional information about this in the manual *Process Control System PCS 7; Service Support and Diagnostics*.

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