SIEMENS

SIMATIC

Process Control System PCS 7 Operator Station (V8.1)

Configuration Manual

Valid for PCS 7 as of V8.1

Security information 1
Preface 2
The PCS 7 Operator Station 3
Introduction to OS configuration 4
Setting languages 5
Configuring OS data in SIMATIC Manager 6
Configuring the OS Data in WinCC Explorer 7
Setting user rights 8
Creating Process Images - Basics 9
Creating process pictures - advanced 10
Message system settings 11
Configuring the archiving functions 12
Time-of-Day Synchronization 13
Sign-of-life monitoring 14
Process Pictures with Tags from Different OS Servers 15
Using the PCS 7 Maintenance Station 16
Server data 17
Downloading and Activating a Project 18
Downloading changes to a project 19
Simulation of an OS 20
Using Additional Tools and Editors 21

03/2015
A5E32785103-AC

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

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

Proper use of Siemens products

Note the following:

⚠ WARNING

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

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Division Process Industries and Drives
Postfach 48 48
90026 NÜRNBERG
GERMANY

A5E32785103-AC
℗ 04/2015 Subject to change

Copyright © Siemens AG 2014 - 2015.
All rights reserved

Table of contents

1 Security information....13
2 Preface....15
3 The PCS 7 Operator Station....21
3.1 Overview of the PCS 7 Operator Station....21
3.2 Configurations for the PCS 7 Operator Station....22
3.3 OS Server and OS Client....25
4 Introduction to OS configuration....27
4.1 Overview of OS Configuration....27
4.2 Overview of Configuration Tasks in SIMATIC Manager....28
4.3 Overview of Configuration Tasks in WinCC Explorer....29
4.4 Using a reference OS....31
4.5 Access protection....32
4.6 Managing projects....33
5 Setting languages....35
5.1 Configuration and User Interface Languages....35
5.2 How to set the language in SIMATIC Manager....36
5.3 How to Set Languages in WinCC Explorer....37
6 Configuring OS data in SIMATIC Manager....39
6.1 Configuring the hardware....39
6.1.1 Overview of Hardware Configuration....39
6.1.2 Setting up the PC Stations....40
6.1.3 Introduction to OS Configuration....40
6.1.4 How to engineer and configure an OS....41
6.1.5 How to Set the Properties of the OS....44
6.1.6 How to Specify the Path for Loading the Destination OS and Standby OS....45
6.1.7 How to Configure a Reference OS for an OS Single Station System....47
6.1.8 How to Configure a Reference OS for an OS client....47
6.2 Configuring the communication paths....48
6.2.1 Configuring Network Connections for an OS....48
6.2.2 How to Configure an OS Network Connection....48
6.2.3 How to Check and Modify the Configuration....50
6.3 Global and Specific Settings....53
6.3.1 Overview of Global and Specific Settings....53
6.3.2 Global Setting Options....54
6.3.3 Specific Setting Options....54
6.3.4 Defining the plant designation....55

6.3.4.1 Higher Level Designations....55
6.3.4.2 How to Specify Settings for the Higher Level Designation....56
6.3.5 Defining the OS area identifier....57
6.3.5.1 OS Area Identifier....57
6.3.5.2 How to Specify the OS Area Identifier....58
6.3.6 Effect of Picture Hierarchy on the Picture Tree Manager....59
6.3.6.1 Relationship Between Picture Hierarchy and Picture Tree Manager....59
6.3.6.2 How to Define the Transfer of the Picture Hierarchy....59
6.3.6.3 How to Specify a Picture Name....60
6.3.7 Updating the OS Area Identifier and Name for the OS....61

6.4 Additional Tasks for OS Configuration....62
6.4.1 Overview of Preparatory Work....62
6.4.2 Using the Process Object View in the OS Configuration....63
6.4.3 Setting the AS-OS assignment....63
6.4.3.1 AS-OS assignment....63
6.4.3.2 How to Make the AS-OS Assignment....64
6.4.3.3 Pictures in the Plant Hierarchy....64
6.4.3.4 How to Insert Pictures....65
6.4.4 Function and Creation of Block Icons....65
6.4.5 Creating block icons....67
6.4.5.1 Procedure for Creating Block Icons....67
6.4.5.2 How to Specify the Creation of Block Icons....67
6.4.5.3 How to Specify the Type of Block Icon....68
6.4.5.4 How to Create and Update Block Icons....69
6.4.6 Adapt the unit and operator texts....70
6.4.6.1 Unit and Operator Texts....70
6.4.6.2 Adapting Unit and Operator Texts....71
6.4.6.3 How to Edit Texts for a Block Type....71
6.4.6.4 How to Edit Texts of Block Instances....73
6.4.7 Defining archive tags....73
6.4.7.1 Archive tags....73
6.4.7.2 How to Identify Tags for Archiving....74
6.4.8 Configuring messages....75
6.4.8.1 Message Configuration....75
6.4.8.2 How to configure project-specific messages....76
6.4.9 Using Block Comments....78
6.4.10 Expanding the Event Text of a Message....78
6.4.10.1 Event Text of a Message....78
6.4.10.2 How to Supplement Block Comments....79
6.4.10.3 How to Delete the Supplementary Information of the Standard Event Text....79
6.4.11 Specifying message priorities....80
6.4.11.1 Message Priorities....80
6.4.11.2 How to Specify a Message Priority....81

6.5 Compiling OS data....82
6.5.1 Compiling the OS....82
6.5.2 Type of Data to be Compiled....83
6.5.3 Properties of the Compilation Modes....84
6.5.4 How to set the compilation mode....84
6.5.5 How to Compile an Individual OS....85
6.5.6 How to Compile Multiple Operator Stations....85
6.5.7 How to Compile and Load Multiple Operator Stations....88

6.6 Managing multilingual texts....89
6.6.1 How to Manage Multilingual Texts....89
7 Configuring the OS Data in WinCC Explorer....91
7.1 Working with WinCC Explorer....91
7.2 Editors in WinCC Explorer....91
7.3 Properties of OS....93
7.3.1 Overview of the OS Properties....93
7.3.2 Setting the Project Properties....93
7.3.3 How to define a user cycle....94
7.3.4 How to define hot keys....95
7.3.5 How to define the global design....95
7.3.6 Setting the Computer Properties....96
7.3.7 How to Work in the "Computer Properties" Dialog Box....98
7.4 Working with the OS project editor....98
7.4.1 Overview of OS Project Editor....98
7.4.2 How to Activate or Deactivate Individual Process Control Messages and Operator Input Messages of the OS....101
8 Setting user rights....103
8.1 Overview of User Permissions....103
8.2 User Permissions per OS Area....105
8.3 Setting user rights....105
8.3.1 User Groups and User Permissions....105
8.3.2 How to Set User Permissions....107
8.4 User Permissions in the Different Editors....108
8.5 Using a Chip Card....108
8.5.1 Smart card....108
8.5.2 How to write a chip card with the WinCC User Administrator (without SIMATIC Logon)....109
8.5.3 How to write a chip card with SIMATIC Logon....110
8.6 Local operator permission....111
9 Creating Process Images - Basics....113
9.1 Process Pictures on the OS....113
9.2 Graphics Designer Overview....113
9.3 Different Objects in the Graphics Designer....114
9.4 Types of Dynamic Updating....115
9.5 Tag Connection and Tag Selection Dialog Box....116
9.6 Configuring and Storing Tags in WinCC....117
9.7 Tag name....119
9.8 Dynamic PCS 7 Standard Objects....119
9.9 Dynamic, custom objects....120
9.10 Configuring dynamic objects....121

9.10.1 Overview of Configuration Tasks for Dynamic Objects....121
9.10.2 How to Open a Picture in the Graphics Designer....122
9.10.3 How to Insert a Dynamic Object....122
9.10.4 How to Specify the Object Properties....123
9.10.5 How to Configure a Dynamic Object....123

9.11 Configuring a status display....125
9.11.1 Configuring a status display....125
9.11.1.1 Working with a Status Display....125
9.11.1.2 How to Configure a Status Display....125
9.11.2 Configuring an extended status display....126
9.11.2.1 Overview of the Extended Display....126
9.11.2.2 Working with the Extended Status Display....127
9.11.2.3 How to determine the operating states from the status word assignment....128
9.11.2.4 Information about the operating states....129
9.11.2.5 How to plan the representation of the extended status display....130
9.11.2.6 How to Insert an Extended Status Display....133
9.11.2.7 How to Make the Tag Connection....133
9.11.2.8 How to Configure an Extended Status Display....134
9.11.2.9 Folder for custom pictures....135
9.11.2.10 How to insert custom pictures in an extended status display....136

9.12 Configuring an Extended Analog Display....138
9.12.1 Working with the Extended Analog Display....138
9.12.2 How to Insert an Extended Analog Display....138
9.12.3 How to Configure an Extended Analog Display....139
9.12.4 How to Make the Tag Connection for the Extended Analog Display....139

9.13 Configuring an input/output box....140
9.13.1 Working with Input/Output Fields....140
9.13.2 How to configure an input/output field....140

9.14 Configuring group displays....141
9.14.1 Overview of the Group Display....141
9.14.2 Displaying a Group Display in Process Mode....142
9.14.3 Configuring a group display....144
9.14.3.1 Group Display Configuration Options....144
9.14.3.2 How to Insert a Group Display....145
9.14.3.3 How to Configure a Group Display....146
9.14.4 Interconnecting the group display to a process tag....147
9.14.4.1 Interconnecting the group display to a process tag....147
9.14.4.2 How to interconnect a Group Display to a Process Tag....148
9.14.5 Interconnecting group displays with pictures....149
9.14.5.1 Interconnecting group displays with pictures....149
9.14.5.2 How to automatically create a group display hierarchy for pictures....151
9.14.5.3 How to interconnect a group display with a picture....151
9.14.5.4 How to Define the Type of Picture Selection....152

10 Creating process pictures - advanced....155

10.1 Overview of Additional Options for Creating Process Pictures....155

10.2 Function and Use of Block Icons and Faceplates....155
10.2.1 Using Faceplates....155
10.2.2 Relationship between Faceplates and Block Icons....156
10.2.3 Block Icons and the @PCS7TypicalsAPL<Version> file....157

10.2.4 Block icons and the @TemplateAPL<Version>.pdl file....159
10.2.5 Rules for using multiple template files....159
10.2.6 Display Types of Faceplates....161
10.2.7 Overview of Block Icon and Faceplate Configuration Tasks....162
10.2.8 How to Insert a Block Icon....162
10.2.9 How to connect a block icon to a process tag....162
10.2.10 How to Connect an Object to a Faceplate....163
10.2.11 How to configure block icons with custom pictures....164

10.3 Displaying messages....167
10.3.1 Using an Alarm Control message window....167
10.3.2 How to insert an Alarm Control....167

10.4 Creating and implementing user objects....168
10.4.1 Creating and implementing user objects....168
10.4.2 Advantages of User Objects as Compared to Single Objects....170
10.4.3 Overview of Configuration Tasks for User Objects....170
10.4.4 How to Generate a User Object....170
10.4.5 How to Configure a User Object....171
10.4.6 How to Configure the Properties....173
10.4.7 How to Store a User Object....174
10.4.8 How to Insert a User Object....174
10.4.9 How to Edit a User Object....176

10.5 Working with user object templates....176
10.5.1 Using and Creating User Object Templates....176
10.5.2 Creating a user object for user object template....177
10.5.2.1 How to create a user object template (example)....177
10.5.2.2 How to create additional required objects....179
10.5.2.3 How to add required objects to a user object....179
10.5.2.4 How to parameterize the user object....181
10.5.2.5 Save....181
10.5.3 User Object Templates and the Graphic Object Update Wizard....182
10.5.4 Wizards for Importing and Exporting Picture Objects....182
10.5.5 Procedure for Importing and Exporting in the Graphic Object Update Wizard....184
10.5.6 Wizard for Updating Picture Objects....184
10.5.7 Wizard for Modifying a Tag Connection....185
10.5.8 How to Create a User Object Template....185
10.5.9 How to Work with the Graphic Object Update Wizard....186

10.6 Using picture windows....188
10.6.1 Picture window....188
10.6.2 How to Use a Picture Window....188

10.7 Working with cross-reference lists....190
10.7.1 General Information - Cross-reference Lists....190
10.7.2 Using cross-reference lists....191
10.7.3 Comparison of Process Object View and Cross-reference Lists....191
10.7.4 How to Generate a Cross-reference List....192
10.7.5 How to Switch to a Location....193
10.7.6 How to Make Corrections....193

10.8 Function of the Picture Tree Manager....194
10.8.1 Function of the Picture Tree Manager....194
10.8.2 Calculating the Group Display Hierarchy....195

11 Message system settings....197

11.1 Overview of the message system....197

11.2 Settings in the OS project editor....199
11.2.1 Settings for the message system in the OS project editor....199
11.2.2 How to make message system settings in the OS project editor....201

11.3 Settings in the Alarm Logging editor....201
11.3.1 Settings for the message system in the "Alarm Logging" editor....201

11.4 Settings for message lists....202
11.4.1 Message List Settings in the Graphics Designer....202
11.4.2 How to Define Properties for Message Lists....203

11.5 Using and Configuring the Horn....204
11.5.1 Function of the Horn....204
11.5.2 Functioning of Signal Tags....205
11.5.3 Acknowledging Signals....206
11.5.4 Settings in the 'Horn' Editor....207
11.5.5 Detail areas for the "Message assignment" hierarchy folder....207
11.5.6 Detail areas for the "Signal assignment" hierarchy folder....209
11.5.7 How to Configure a Horn....210
11.5.8 Example Configurations....213
11.5.9 OS Client with Transducer....213
11.5.10 OS Clients with Multiple Acknowledgment in a Group....214
11.5.11 OS Server with Transducer....215

11.6 Locking/unlocking or displaying/hiding messages....216
11.6.1 Disabling and Enabling Messages....216
11.6.2 Hiding and showing messages....217
11.6.3 Manual Hiding and Showing of Messages in Process Mode....218

12 Configuring the archiving functions....221

12.1 Archiving in PCS 7....221

12.2 Editors for Archive Configuration....222

12.3 Configuring archives on an OS server....223

12.4 Backup configuration....224

12.5 How to configure the archives in the "Tag Logging" editor....225

12.6 How to configure the message archive in the "Alarm Logging" editor....226

12.7 Determining the Archive Storage Capacity Requirements....227

12.8 Calculation of storage space and the number of single segments....229

12.9 Configuring additional archives in Tag Logging....230
12.9.1 Additional Archives in the "Tag Logging" editor....230
12.9.2 Overview of Configuration Steps for a TagLogging archive....230
12.9.3 How to Define a New Archive....231
12.9.4 How to Specify the Tag Properties....231

12.10 Configuring and using a Process Historian (external archive server)....233
12.10.1 Overview of archiving with the Process Historian....233
12.10.2 Archiving of messages and archive values....236

12.10.3 Archiving of batch logs....236
12.10.4 Archiving on a redundant SIMATIC Process Historian....236
12.10.5 Rules for Archive Configuration....237
12.10.6 Configuring a Process Historian in overview....237
12.10.7 Configuration of a redundant Process Historian....238
12.10.8 How to create and configure a Process Historian....239
12.10.9 How to archive batch logs....240
12.10.10 Displaying archive data on the OS client....240
12.10.11 Displaying archive data of the Process Historian with the Information Server....240

12.11 Using the Report Designer....241
12.11.1 Overview of Reports with the Report Designer....241
12.11.2 Layouts in the Report Designer....242
12.11.3 Reports in the Report Designer....243

12.12 Archive values in process pictures....244
12.12.1 Overview of Displaying Archive Values in Process Pictures....244
12.12.2 Trend Display and Trend Display Configuration in Process Mode....244

12.13 Working with the Online Trend Control....245
12.13.1 Function of the Online Trend Control....245
12.13.2 Tag connection in Online Trend Control....245
12.13.3 Configuration steps for the Online Trend Control....245
12.13.4 How to insert an Online Trend Control....246
12.13.5 How to copy properties for the value axis automatically....246

12.14 Working with the FunctionTrendControl....248
12.14.1 Function of the Function Trend Control f(x)....248
12.14.2 Tag connection in the Function Trend Control....248
12.14.3 How to insert a Function Trend Control....249

13 Time-of-Day Synchronization....251

13.1 Setting the TOD Synchronization....251
13.1.1 Overview of Time Synchronization....251
13.1.2 Time synchronization with alternative time masters....251
13.1.3 Operating with Local Standard Time and Coordinated Universal Time (UTC)....252
13.1.4 How to Set the Time System....252
13.1.5 Time Synchronization with External Clocks....253
13.1.6 How to Connect a DCF77RS or GPSDEC....254
13.1.7 Time Synchronization via Terminal Bus....254
13.1.8 Time Synchronization via Plant Bus....255
13.1.9 Time Synchronization in the Workgroup....256
13.1.10 How to Make the Settings for the Workgroup....256
13.1.11 Time synchronization in a domain....257
13.1.12 How to synchronize with a domain controller....258

14 Sign-of-life monitoring....261

14.1 Configuring lifebeat monitoring....261
14.1.1 Overview of Lifebeat Monitoring....261
14.1.2 Display of Lifebeat Monitoring in Process Mode....262
14.1.3 How to Configure Lifebeat Monitoring....262

15 Process Pictures with Tags from Different OS Servers....265

15.1 Interconnection of Tags of Different OS Servers....265

15.2 Example Configuration for Tag Connection....266
15.3 How to Configure Pictures with Tags of Different Servers....267
16 Using the PCS 7 Maintenance Station....269
17 Server data....271
17.1 Downloading Server Data....271
17.1.1 Generating and Downloading of Server Data....271
17.1.2 How to Download Server Data....271
17.2 Determining the Standard Server for OS Client....272
17.2.1 How to Assign the Standard Server....272
18 Downloading and Activating a Project....275
18.1 Overview of Downloading a Project....275
18.2 Requirements for Downloading an Entire Project....275
18.3 Background Information on Compiling and Downloading an Entire Project....277
18.4 How to Download Multiple Operator Stations....278
18.5 How to Download a Single OS....279
18.6 How to Activate a Project....280
18.7 Archiving with Process Historian....280
19 Downloading changes to a project....281
19.1 Background Information on "Download Changes" Function....281
19.2 Downloading changes....282
19.3 Project Changes in the Plant View....283
19.4 Project Changes in the Component View....283
19.5 Changes in CFC/SFC Charts....284
19.6 Changes in Blocks and Block Instances....284
19.7 Changes in WinCC Explorer....285
19.8 Full download....285
20 Simulation of an OS....287
20.1 Simulation of an OS....287
20.2 How to Start Simulation....287
21 Using Additional Tools and Editors....289
21.1 The "Text Library" editor in the WinCC Explorer....289
21.1.1 Text Library....289
21.1.2 Relationship Between OS Compilation and the Text Library....290
21.1.3 How to Change the Unit and Operator Texts in the Foreign Languages....291
21.2 Operator control and monitoring of the process mode via the Internet/Intranet....292
21.3 Programming with scripts....293
21.3.1 Function of Global Script....293

21.3.2 Global Script - Programming with C Script....294
21.3.3 Global Script - Programming with VB Script....294
21.3.4 Programming with VBA....295
21.4 Overview of Additional Tools....295
21.4.1 Additional Tools for OS....295
Index....297

Security information

1

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit http://www.siemens.com/industrialsecurity.

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

Preface

2

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.

Options for accessing PCS 7 documentation

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

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

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

Note

PCS 7 Readme (Internet version)

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

Please read this *PCS 7 Readme* carefully; it contains important information and amendments on PCS 7.

Documentation for PCS 7 on the *Process Control System; SIMATIC PCS 7* DVD

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

    Note

    The following PCS 7 system documentation is included:
    - Product overview *Process Control System PCS 7; PCS 7 Documentation*
    - Configuration manual *Process Control System PCS 7; Engineering System*
    - Function manual *Process Control System PCS 7; PCS 7 - PC Configuration*
    - Configuration manual *Process Control System PCS 7; Operator Station*
    - Function manual *Process Control System PCS 7;.OS Process Control*
- The product documentation is installed with the relevant product.

Documentation for PCS 7 on the Internet (current versions)

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

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

    Note

    PCS 7 Documentation Portal Setup

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

  - The link to download the entire PCS 7 documentation as a *Manual Collection* in the My Documentation Manager (http://support.industry.siemens.com/my/ww/en/documentation/advanced/).
    The *Manual Collection* includes the manuals for hardware and software.
- **In the section "Hardware Manuals for SIMATIC PCS 7 ..."**
  - The link to the latest manuals for components approved for a PCS 7 version.
  - The link to the latest manuals for approved SIMATIC PCS 7 industry software for PCS 7.

Catalogs, brochures, customer magazines and demo software

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

Required basic knowledge

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

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

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

Conventions

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

Changes compared to the previous version

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

As of PCS 7 V8.1

- The Process Historian is the external archive server for PCS 7 plants.
- The size of the block icons in the process image of an OS can be configured on the ES (zooming of the block icons).

As of PCS 7 V8.0 SP1

- New function: User-configurable message classes

Guide

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

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

Additional documentation

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

- Online help *WinCC Information System* The support offered by this is only a few settings and configurations away. To open the *WinCC Information System*:
  - Click the "?" in the menu bar.
  - Click "Help" in the dialog box.
- *Process Control System PCS 7; OS Process Control* manual: The manual provides exhaustive information about operating and monitoring in process mode.

- Manual *Process Control System PCS 7; PCS 7 - PC Configuration*: Provides information about hardware / software requirements and about configuration options of a PCS 7 OS.
- Manual *Process Control System PCS 7; Engineering System*: Provides all detailed information you need to work with the Engineering System.

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

The PCS 7 Operator Station

3

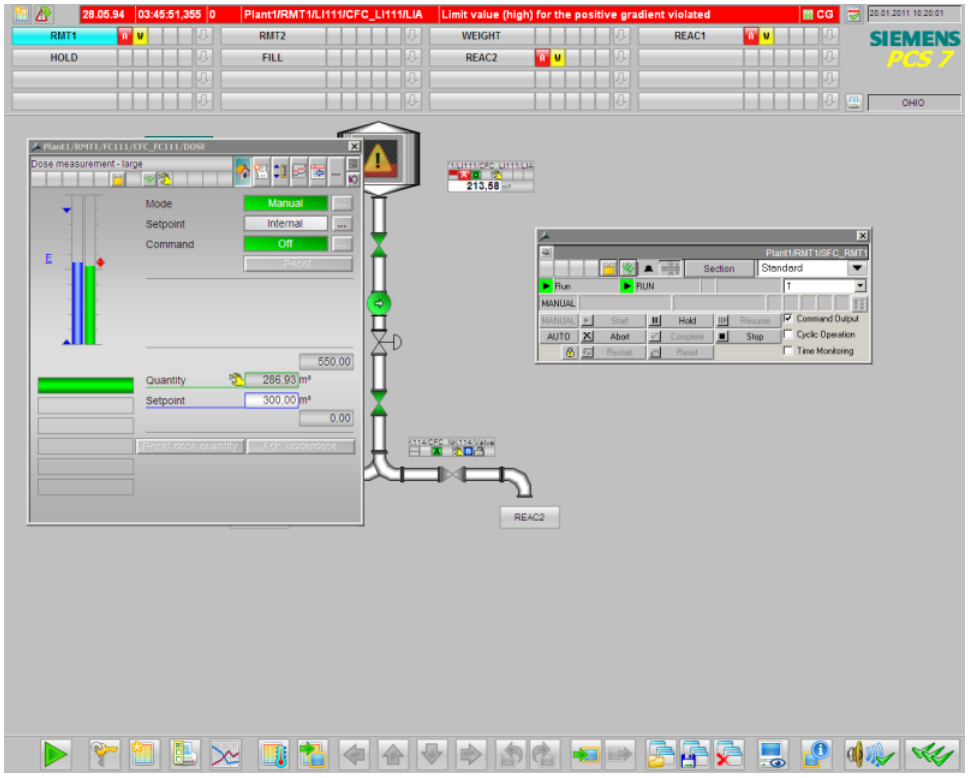
3.1 Overview of the PCS 7 Operator Station

Operator Station in Process Mode

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

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 additional information about this in the section "Configuration and User-Interface Languages (Page 35)".

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

3.2 Configurations for the PCS 7 Operator Station

Overview

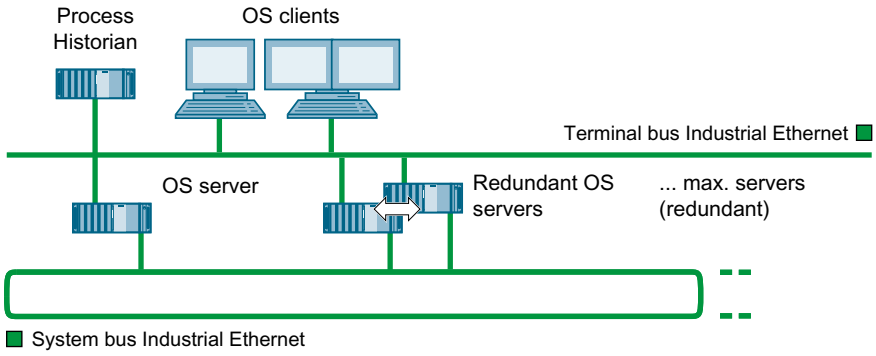
Operator stations are PCs on which the PCS 7 OS software is installed. The operator station is connected to the system bus to allow data communication with the automation system.

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

The OS server contains all the data of the 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 of one or more OS servers.

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

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



Possible PC configurations for operator stations

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

- OS as single station system on a single PC:
  The complete operator control and monitoring capability for a PCS 7 project (system/ subsystem) is located in one station. The OS single station system on the system bus can be used in parallel with additional single station or multiple station systems.
  Two OS single station systems can also be operated redundantly with the *WinCC/ Redundancy* software package.
  The operator station can also be used in combination with an engineering station and an automation system on a single PC. This solution is offered as the SIMATIC PCS 7 BOX.
- OS as a multiple station system with client-server architecture:
  The OS multiple station system consists of OS clients (operator stations) that are supplied with data (project data, process values, archives, alarms and messages) by one or more OS servers via a terminal bus.
  OS clients can access data on several OS servers simultaneously (multi-client operation). OS servers also feature client functions so that they can access data (archives, messages, tags, variables) on other OS servers. This allows process pictures on one OS server to be interconnected with tags on other OS servers (server-to-server communication).
  You can find additional information on server-to-server communication in the section "Creating and Downloading Server Data (Page 271)".
  The *PCS 7 Server Redundancy* software package facilitates redundant operation of the OS servers.
- Plant configuration with multiple OS single station systems
  Configurations with multiple OS single station systems are possible in SIMATIC PCS 7. The maximum configuration includes the following OS single station system:
  - 1 redundant OS single station system (single station system + single station system standby)
  - 6 non-redundant OS single station systems (as reference OS from the OS single station system)
  - Connection of PCS 7 Web client and/or PCS 7 Web diagnostics client to the reference OS
  - SIMATIC BATCH and Process Historian can be used

PC station for long-term archiving (Process Historian)

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

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

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

You can find additional information about this in the section "Archiving with PCS 7 (Page 221)".

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 269)".

Web option for OS

The following configuration is used in PCS 7:

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

You can find additional information on this in the section "Operator control and monitoring of the process mode via Internet/Intranet (Page 292)".

Redundant operator station

In the case of a redundant setup, design the OS server for redundant use.

Additional information

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

3.3 OS Server and OS Client

OS server

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

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

The advantages of distributed systems are:

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

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

OS clients

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

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

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

Additional information

- You can find information about the server-server communication in the section "Creating and downloading server data (Page 271)".
- You can find information about the configuration limits in the installation manual *Process Control System PCS 7; Licenses and Configuration Limits*.

Introduction to OS configuration

4

4.1 Overview of OS Configuration

Configuring the OS

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

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

- SIMATIC Manager:
  - Configuring the Plant Hierarchy, hardware and communication connections (Page 28)
  - Creating process pictures in the Plant Hierarchy (Page 28)
- 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 CFCs. 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 process tags.

- When you insert objects in process pictures, you can interconnect them easily and directly with I/Os of blocks that you previously used in CFCs, for example.
- The PCS 7 Wizards provide convenient help for the dynamic representation of objects in process pictures.

Adherence to configuration limits

Note

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

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

4.2 Overview of Configuration 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. You can find detailed information about each individual configuration task in the following sections.

Configuring hardware and connections

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

Configurations for the OS in SIMATIC Manager

Configuration tasks	Mandatory	Optional
Access protection for projects		X
Inserting pictures in the plant hierarchy	X	
AS-OS assignment	X	
Creating block icons	X	
Changing unit and operator texts		X
Defining archive tags		X

Configuration tasks	Mandatory	Optional
Enable the "Transfer to external archive server" option on the OS servers from which data is to be exported to the Process Historian [1)]		X If you use the Process Historian
Configuring messages		X If you want to define messages that deviate from the standard
Enter block comments for additional information		X
Specifying the message number range	X	
Defining the message priorities		X Important for messages in the message line of the overview area
Specifying hidden messages by means of "Alarm Hiding"		X If you want to hide individual messages at a certain point in time
Defining the plant designation	X	
Defining the OS area identifier	X[2)]	X Control and monitoring attributes
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	

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

2) Plant hierarchy

After completing all configuration tasks

Step	Mandatory	Optional
Downloading the OS [3)]	X	

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

4.3 Overview of Configuration 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 task in the following sections.

OS configurations in WinCC Explorer

Configuration tasks	Mandatory	Optional
Setting the object properties		X
Setting the computer properties		X
Setting parameters in the OS Project editor		X If you want to make settings that deviate from the standard
Setting up User right	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 message system parameters: • 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	
Setting the • Time synchronization • Sign-of-life monitoring	X	X
Setting up the PCS 7 maintenance station		X
Simulation of the OS on the ES		X

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

Step	Mandatory	Optional
Activating the project	X	

4.4 Using a reference OS

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

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

Note

The following applies to a multiproject:

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

Basic configuration

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

Note

Downloading the OS

After changing the configuration, always **load all reference OSs**.

Messages in plants with reference OS

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

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

Note

Shows messages from all OS

The operating messages of the basic OS and the reference OS single station system can be viewed in the message system of the OS single station system under the following conditions:

- A Process Historian is available in the plant.
- The archive of the basic OS and the reference OS single station system are synchronized with the Process Historian.

Using Process Historian in a plant with a reference OS

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

Additional information

- Section "How to Configure a Reference OS for an OS Single Station (Page 47)"
- Section "How to Configure a Reference OS for an OS client (Page 47)"

4.5 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*

4.6 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

5

5.1 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 multiple languages are used.
  - Operating system language 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.

  You can find additional information about installing the operating system, the languages and language switching in the manual *Process Control System PCS 7; PCS 7 - PC Configuration*.
- 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.

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

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 36)
- Setting the languages in the WinCC Explorer (Page 37)

5.2 How to set the language in SIMATIC Manager

Overview of language settings in SIMATIC Manager

You make the following language settings in SIMATIC Manager:

- Language for the configuration interface of 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 89)".

5.3 How to Set Languages in WinCC Explorer

Overview of Language Settings in WinCC Explorer

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

- Language for the WinCC Explorer configuration interface
- Language for display devices
  You can select 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 6

6.1 Configuring the hardware

6.1.1 Overview of Hardware Configuration

System structure in SIMATIC Manager and in HW Config

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

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

You will usually work with a multiple station system.

You can find information about OS project types in the section "Configuration of the PCS 7 Operator Station (Page 22)".

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

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

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

What?	Where?
Setting up the PC stations (network adapters) for the ES 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 47)
- Configuring a reference OS for an OS client (Page 47)

Additional information

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

6.1.2 Setting up the PC Stations

Settings on all PC stations

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 make the following settings on all PC stations:

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

Make these settings on the central engineering station first.

Additional information

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

6.1.3 Introduction to 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 41)
- Setting the OS properties (Page 44)
- Creating the path for loading the target OS and specifying the standby OS (Page 45)

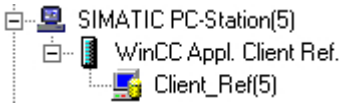
Optional:

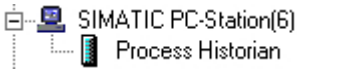
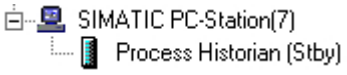
- Creating a reference OS for an OS single station (Page 47)
- Creating a reference OS for an OS client (Page 47)

6.1.4 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	
Standby OS server or standby OS single-station system	WinCC application (stby)	
OS client	WinCC application client	
Reference OS single-station system	WinCC application ref	
Reference OS client	WinCC appl. Client ref	

Type of OS	WinCC application	Representation in the SIMATIC Manager
Process Historian server	Process Historian Appl.	
Standby Process Historian server	Process Historian 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 double-click the "Configuration" object in the Details View to open HW Config.
   The hardware configuration of the SIMATIC PC station opens.
5. If the hardware catalog is not visible, select the menu command**View > Catalog**.
   The hardware catalog opens.
6. Insert the 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.

     Note

     ISO or TCP/IP

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

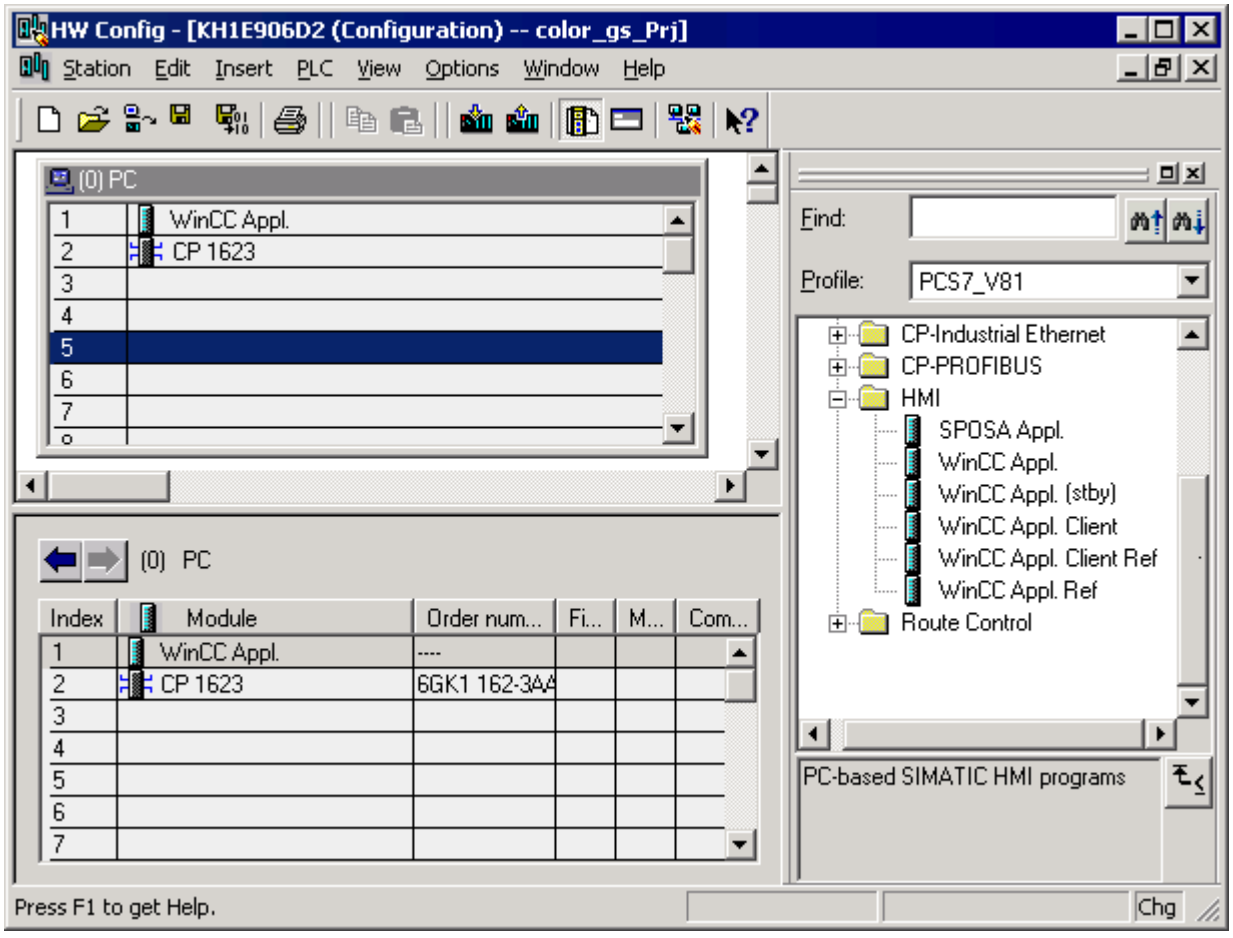
     You must use the ISO protocol if operator station time synchronization take place via BCE.

     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.
     - 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.

6.1.5 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.

6.1.6 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 Read the following sections when dealing with a reference OS client and reference OS single station system: • "How to Configure a Reference OS for an OS Single Station System (Page 47)" • "How to Configure a Reference OS for an OS client (Page 47)"

Requirements

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

- All required operator stations have been created in SIMATIC Manager.
- Network connections have been configured for all 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.

   Note

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

   \\[Server name]\[Directory name]\...\
5. If you have created a redundant OS server (standby server) for the OS server (master server), assign the master server 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" check box.
7. If you use a Process Historian in your project and want to export data to this Process Historian, select the "Transfer to external archive server" check box.

   Note

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

   You can find information on archiving in the section "Archiving in PCS 7 (Page 221)".
8. Click "OK".

The settings are complete.

6.1.7 How to Configure a Reference OS for an OS Single Station System

Requirement

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

Procedure

1. In 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 41)".
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 45)".
7. If you are using Process Historian as an external archive server in the plant, read the following paragraph "Using the Process Historian as an archive server for the reference OS".
8. Click "OK".

Using a Process Historian as an archive server for the reference OS

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

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

6.1.8 How to Configure a Reference OS for an OS client

Requirement

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

Procedure

1. Create 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 41)".
2. In SIMATIC Manager, select the reference OS.
3. Select the menu command **Edit > Object Properties**.
4. Select the "OS Client Reference Options" tab.
5. Select the base OS from the drop-down list.
6. Enter the path for the target OS computer.
   For more information, refer to the section titled "How to define the standby OS and the path for downloading the target OS (Page 45)".
7. Click "OK".

6.2 Configuring the communication paths

6.2.1 Configuring Network Connections for an OS

Introduction

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.

6.2.2 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".

   Note

   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

6.2.3 How to Check and Modify the Configuration

Checking the configuration

Note

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

- It is connected via a SIMATIC CP to the plant bus with Industrial Ethernet
- It is not integrated into the ES
- It has one of the following configurations:
  - Single station
  - 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** menu command.
   The "HW Config - [Name of PC station] (configuration) - - Vx.y" dialog box opens.
3. Select the **Station Configuration Editor** command in the Windows start menu on the OS.

4. Compare the list entries in HW Config on the ES and in the Station Configuration Editor on the OS:
   - The entries in the "Index" and "Name" columns must match, e.g. index ="1" and name = "WinCC application".
   - The name of the PC station in HW Config on the ES must match the entry in the "Station" field in the Station Configuration Editor on the OS.
5. Make any necessary corrections by dragging the list entry in the Station Configuration Editor on the OS with the mouse to the same position as in HW Config on the ES. The procedure can also take place in reverse in HW Config on the ES.
6. Check the status of the connection in the Station Configuration Editor on the OS in the "Status" column. For additional information, refer to the online help for this dialog box. The following symbol shows that the component is ready:

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 **Station > Save and Compile** from the menu.
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 **SIMATIC > SIMATIC NET** submenu of the Windows Start menu, select the menu command **Configuration console**.
   The "Configuration console" dialog box 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 Station Configuration Editor on the OS in the "Status" column. Icons are used to indicate the status of the component.
   The icon must denote the status "Component is ready for operation".

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

Note

If the "Configuration inconsistent" icon is shown due to a change in the IP address, for example, the OS PC has to be restarted.
If neither of these two symbols is displayed, find additional information in the online help of the dialog box.

6.3 Global and Specific Settings

6.3.1 Overview of Global and Specific Settings

Introduction

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.

6.3.2 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.

6.3.3 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

6.3.4 Defining the plant designation

6.3.4.1 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.

6.3.4.2 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.

6.3.5 Defining the OS area identifier

6.3.5.1 OS Area Identifier

OS area identifier for OS areas

The OS areas are derived from the system structure you 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.

6.3.5.2 How to Specify the OS Area Identifier

Introduction

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

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

Making the global setting

1. In the SIMATIC Manager plant view, select the hierarchy folder that 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.

Note

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

6.3.6 Effect of Picture Hierarchy on the Picture Tree Manager

6.3.6.1 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.

Note

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.

6.3.6.2 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. Select the "Derive picture hierarchy from plant hierarchy" check box.
   This way the picture hierarchy is transferred to the Picture Tree Manager during compilation of the OS.
4. Click "OK".

Note

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

6.3.6.3 How to Specify a Picture Name

Requirement

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

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder 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".

   Note

   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.

6.3.7 Updating the OS Area Identifier and Name for the OS

Updates in the OS

If you make changes to the following objects in 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

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

Adhere to the following rules to ensure a consistent configuration:

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

⚠ CAUTION

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

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

Settings for the consistency of the configuration data

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 additional information on this subject, refer to the chapter "How to Define the Adoption of the Picture Hierarchy (Page 59)".
- In the object properties of the hierarchy folder:
  The "No modification when renaming the hierarchy folder" check box is **deactivated** (default)

6.4 Additional Tasks for OS Configuration

6.4.1 Overview of Preparatory Work

Preparations for the OS configuration

You must perform the following preparatory steps:

- Setting the AS-OS assignment
- Inserting pictures in the plant hierarchy
- Specifying the option for creating block icons
- 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.

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

6.4.2 Using the Process Object View in the OS Configuration

Process object view

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

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

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

Additional information

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

6.4.3 Setting the AS-OS assignment

6.4.3.1 AS-OS assignment

AS-OS assignment of a hierarchy folder

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

- All 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.

6.4.3.2 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.

6.4.3.3 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.

6.4.3.4 How to Insert Pictures

Requirement

The appropriate hierarchy folder has been assigned to an OS.

Procedure

1. In the SIMATIC Manager plant view, select the hierarchy folder 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.

Note

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

6.4.4 Function and Creation of Block Icons

Using block icons

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

Example of a block icon

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



Faceplates and block icons

The "Create/Update Block Icons" function automatically positions and 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.

You can find additional information on this topic in the section "Relationship between Faceplates and Block Icons (Page 156)".

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:

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

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

You can find more information on this file in the section "Block Icons and the @PCS7TypicalsAPL<Version> file (Page 157)".

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 additional information available on this in the section "How to Create and Update Block Icons (Page 69)".

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.

6.4.5 Creating block icons

6.4.5.1 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.

  Note

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

- The "Zoom the block icons" function defines a plant-specific size of the block icons.
- These CFC charts are searched for blocks with the attribute "S7_m_c:=true", indicating they are intended for operator control and monitoring.
- The data for creating block icons 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.

6.4.5.2 How to Specify the Creation of Block Icons

Introduction

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

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

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

Requirements

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

- A CFC chart
- A picture

Making settings in the object properties of the picture

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

Making the setting in the process object view

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

You can find additional information about creating block icons in the section "How to create and update block icons (Page 69)".

6.4.5.3 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:

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

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

   You can find information about this in the section "Block Icons and the @PCS7TypicalsAPL<Version> file (Page 157)".

5. Click "OK".

   Note

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

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

6.4.5.4 How to Create and Update Block Icons

Introduction

You can 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. If you want to specify a plant-specific size of the block icons, adapt the zoom factor in the "Zoom the block icons" area.

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

Note

After creating/updating block icons, compile the Operator Station so that the required 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.

6.4.6 Adapt the unit and operator texts

6.4.6.1 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 155)".

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 additional information available on this in the section "How to Change Unit and Operator Texts in Foreign Languages (Page 71)".

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.

6.4.6.2 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.

NOTICE
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.

6.4.6.3 How to Edit Texts for a Block Type

Note

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

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

Overview of the steps

Step	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".

NOTICE
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.

6.4.6.4 How to Edit Texts of Block Instances

Requirement

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

Procedure

1. Open the process object view in 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.

6.4.7 Defining archive tags

6.4.7.1 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 Process Historian in your plant. Initially, the data are archived locally on the OS server as defined by the "Archiving" setting. The data are also archived on the Process Historian 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 Process Historian. This is assuming that you have configured and activated a Process Historian.

You can find additional information about archiving and the Process Historian in the section "Archiving with PCS 7 (Page 221)".

Definition of archiving type for archive-relevant process values

You can define the archiving type in two places:

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

6.4.7.2 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.

6.4.8 Configuring messages

6.4.8.1 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.

Note

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.

6.4.8.2 How to configure project-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.

   Note

   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 check box 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.

Displaying project-specific texts

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

Examples at the block EventTS:

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

You can find additional information on this topic in the section "Compiling OS data (Page 82)".

6.4.9 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 78).
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.

6.4.10 Expanding the Event Text of a Message

6.4.10.1 Event Text of a Message

Message form

In process mode, a message includes the following information:

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

Event text in a message

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

Function of expanded event text

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

- Keyword
- Block comment

Each block has a standard defined event text. 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.

6.4.10.2 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.

6.4.10.3 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.

Note

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.

6.4.11 Specifying message priorities

6.4.11.1 Message Priorities

Using the message priority

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

- Not yet acknowledged
- Highest priority

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

Specifying message priorities

By default, the latest message is always the first message displayed in the message list. You can change 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.

6.4.11.2 How to Specify a Message Priority

Specifying the message priority for a block type

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

Note

Important steps

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

Specifying the message priority for a block instance

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

3. 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.

6.5 Compiling OS data

6.5.1 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
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).
Want to compile several operator stations,	select the desired project in the component view of the SIMATIC Manager and select the menu command **Options > 'Compile Multiple OSs' Wizard > Start...**
Want to compile and load several operator stations,	select the multiproject or project in the component view of the SIMATIC Manager and select the menu command **CPU > Compile and Download Objects**. In the "Compile and Download Objects" dialog box, you can then select the check boxes for the desired operator stations, make the compile settings and start the compiling and loading process.

Note

Working with a multiproject

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

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

6.5.2 Type of Data to be Compiled

Data required for the OS

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

- Assignment of S7 programs to operator stations.
  Make this assignment in the wizard for compiling the OS.
- Areas defined in SIMATIC Manager
  These OS areas are important for proper assignment of messages in process mode, for the picture hierarchy and for assignment of user 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]

6.5.3 Properties of the Compilation Modes

Introduction

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

Compilation modes

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

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

6.5.4 How to set the compilation mode

Procedure

1. 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.

   Note

   A complete compilation is required after changing the compilation mode.
5. Click "OK".

6.5.5 How to Compile an Individual OS

Requirement

- The correct "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 85)".

6.5.6 How to Compile Multiple Operator Stations

Requirements

- The correct "Language for display devices" is set.
  It is necessary to check the language if you have modified unit or operator texts 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 84).

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 "Select the data you want to compile and the scope of the compilation" step is displayed. In this step you specify which data is to be compiled.
    You can find further information about this in the online help for the "Wizard: Compiling Multiple OSs" dialog box.
    Default settings (selected options):
    - "Tags and messages" check box selected
    - "SFC visualization" check box: selected
      (display of SFCs in process mode)
    - "Picture Tree" check box: selected
    - "Minimum acquisition cycle of the archive tags:" drop-down list: 1 second
      (Project-specific settings):
    - Scope (data to compile) "Entire OS":
      You must always compile the entire 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.
   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.
   Default settings (selected options):
   - "Tags and messages" check box: selected
   - "SFC visualization" check box: selected
     (display of SFCs in process mode)
   - "Picture Tree" check box: selected
   - "Minimum acquisition cycle of the archive tags:" drop-down list: 1 second
     (Project-specific settings):
   - Scope (data to compile) "Entire OS":
     You must always compile the entire OS during the first compilation. Following changes, you can enable the "Changes" checkbox.
10. Click "Next".
11. 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.
12. Click "Compile".
    The OS data is compiled.

6.5.7 How to Compile and Load Multiple Operator Stations

Requirements

- If you are using OS servers and OS clients in the project:
  - The OS clients have been assigned to the OS servers.
- If you are using one of more reference OS in the project:
  - The reference OS has been assigned to the base OS.
  - The base OS has already been compiled for the purpose of 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 85).
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*

6.6 Managing multilingual texts

6.6.1 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 35)".

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 7

7.1 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

NOTICE
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.

7.2 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.
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.

7.3 Properties of OS

7.3.1 Overview of the OS Properties

Introduction

Specific properties must be set for each individual OS.

Setting	Meaning
Project properties (Page 93)	The project property settings apply to the entire OS.
Computer properties (Page 96)	The computer property settings apply to the OS you have opened via SIMATIC Manager.

7.3.2 Setting the Project Properties

Cross-project settings

Cross-project settings are made in the project properties:

Tab	Settings / meaning
General information	You can enter the author as well as the project version and a comment. You can change the project type via the "type" selection field.
Update cycle	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: • Logon • Log off • Hard copy These functions are used by plant operators in process mode.

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

Additional information

- Online help *WinCC Information System*.

7.3.3 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*

7.3.4 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*

7.3.5 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. The currently selected style is displayed in the "Active design" area. If the currently selected design does not show "WinCC 3D", click on the "Edit" button. You can find additional information on the design in the section "Setting the project properties (Page 93)".

   Note

   Note the following:

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

5. If you want to make changes to the "main color palette", click "Edit".
6. Click "OK".

Additional information

- Online help *WinCC Information System*

7.3.6 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. In this tab, you can make various settings depending on the configuration phase:

Configuration phase	Setting
If you have not started the configuration phase:	Select the software language. You can find information about this in the section "How to Set Languages in WinCC Explorer (Page 37)".
If you are still in the configuration phase:	Do not make any settings in this tab.
If the project goes into actual operation:	Disable all Windows hotkeys that the operator is not allowed to 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.

Note

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

Settings for process mode – "Runtime" tab

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

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

7.3.7 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*

7.4 Working with the OS project editor

7.4.1 Overview of OS Project Editor

OS Project Editor

In the OS Project Editor, you make the settings for the user interface that the operator will use for 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 shortcut menu and select the menu command **Open**.

Introduction to the OS Project Editor

The OS Project Editor provides the following tabs:

Tab	Function
Layout	Monitor configuration and definition of buttons in order to allow operators to change between OS areas and OS servers
Message configuration	Definition of the representation of messages in process mode. This tab is only active if the "Complete configuration (loading online changes no longer possible)" option button or the "Only message configuration (loading online changes no longer possible)" option button is activated in the "General" tab. You can 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 additional information, refer to the chapter "Message priorities (Page 80)".
Message display	Settings for the following messages displays: • Message filter • Extended message line • Authorization check of messages without area entry • Manual hiding of messages (Smart Alarm Hiding) • Sorting of message pages • Creating the group display hierarchy • Block comments of operator input messages Assignment of messages without 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.

Tab	Function
Areas	• Definition of the OS areas a plant operator can call in the overview area • Definition of the picture selection for OS areas if user rights are missing. – Picture selection not possible: The operator is denied access to the area pictures (default behavior, as in PCS 7 V6.1 SP1). – Picture selection for protected areas possible with area selection buttons: Operators can use these buttons to access the area pictures. Access by way of group displays in the overview area and in Picture Tree Navigator is not allowed. Area-specific messages are hidden. Process controls are not possible in PCS 7 faceplates. Operator input in the process pictures depend on configured user authorization levels. – Picture selection for protected areas possible with area selection buttons and group displays: Operators can use the area selection buttons, the group displays in the overview area and Picture Tree Navigator to access the area pictures. Area-specific messages are hidden. Process controls are not possible in PCS 7 faceplates. Operator input in the process pictures depend on configured user authorization levels. For additional information, refer to the Online Help for the *WinCC Information System*.
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.
Basic data	Definition whether to restore the factory state of the object. The list includes all project objects which were changed after initialization of the basic data. You can select the following objects: • Pictures • Faceplates • Scripts • Color areas of APL faceplates If you have customized the color areas of the faceplates of the Advanced Process Library project-specific and do not want to reset them, make sure that the "Update palette colors of Advanced Process Library" check box is disabled. (default setting).
General information	• Settings in the "OS project editor" for the "Download changes" function. Note that a complete download operation is required if "Complete configuration" is set. • Settings for the logs created in OS Project Editor • Printing or viewing the 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

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

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

7.4.2 How to Activate or Deactivate Individual Process Control Messages and Operator Input Messages of the OS

Introduction

The default process control messages and operator input messages for the OS are available in the OS Project Editor for 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

8

8.1 Overview of User Permissions

User right in process mode

User right 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.

Note

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 message system settings in the OS project editor (Page 201)".

When plant operators log on in process mode by entering their logon name and password in order to monitor and control the process, their user rights are checked. Based on the user rights, only the plants areas and functions that match the assigned permissions are released for operation.

"User Administrator" Editor

User permissions 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 98)" and in the *WinCC Information System* Online help.

User right for Web applications

When you use a PCS 7 Web client/PCS 7 Web Diagnostics client that provides the plant operator control and monitoring functions via the Internet or Intranet, you need to configure corresponding user rights as well as special settings for Web access.

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

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

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

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

Instance-specific operator authorization levels

Each operation is assigned an operator authorization level in the faceplates.

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

Table 8-1 Setting the operator authorization level

Setting in the user management	Setting in CFC
No process control, monitoring only	0
Process controls	1
Higher process controls	2
Highest process controls	3
Extended operation 1	4
Extended operation 2	5

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

8.2 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.

Note

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.

8.3 Setting user rights

8.3.1 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:

Check boxes	Meaning
Deactivated	No authorization
Selected	Authorization for the corresponding OS area
Colored background	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 permissions for them. You can only assign a group name once. You can create individual users within a user group. Authorization level 1 "User administration" is the default for the users in the "Administrator" group. You cannot delete this level.

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

User

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

8.3.2 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 – WinCC Configuration Studio" window opens.
3. Select the "User Administrator" hierarchy folder in the tree view.
4. If you want to assign authorization levels in addition to the pre-defined authorization levels, create them in the "Authorization levels" tab.
5. To create groups, switch to the detail section of the the "Groups" tab.
6. Enter the name of the group in the "Group name" column.
7. Select the name of the group in the "Group name" column.
8. Set the properties for the groups.
   The properties are used as defaults when creating users in this group.
9. Select the hierarchy folder [name of group] in the tree view.
10. To set authorizations for the group, switch to the detail section of the "Authorizations" tab.
11. Enable the desired properties for the group.
    The authorizations are used as defaults when creating individual users in this user group.
12. To create users for the group, switch to the detail section of the "User" tab.
13. Enter the name of the user in the "User name" column.
14. Select the name of the user in the "User name" column.
15. Set the properties for the user.
16. To set authorizations for the user, switch to the detail section of the "Authorizations" tab.
17. Enable the desired authorizations that are to apply to this user only.
18. Select the menu command **File > Exit**.

Additional information

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

8.4 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 230)".

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.

8.5 Using a Chip Card

8.5.1 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 109) (without SIMATIC Logon).
- You can use the chip card in conjunction with the SIMATIC Logon (Page 110) service.

Additional information

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

8.5.2 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 smart card with the WinCC User Administrator.

Requirements

- Read and write-capable smart card readers
  The smart card reader is connected to a USB port.
  You can find information about the type of smart card reader in the documentation *Process Control System SIMATIC PCS 7; Catalog ST PCS 7*
- The smart card reader interface has been configured.
  - Double-click "WinCC Chipcard Terminal" icon in the Control Panel of the operating system.
    You must have Windows administrator rights in the configuration dialog.
  - In the "WinCC Chip Card Terminal Configuration" dialog box, enable the "Terminal active" check box.
  - From the "Connection" drop down list box, select the required interface and then click "OK". Your settings are applied.
- There is a smart card in the smart card reader.

Smart cards

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

Procedure

1. Select **WinCC Chip Card Terminal** in the Windows Control Panel.
   This activates the smart 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 smart card.

Additional information

- Online help *WinCC Information System*

8.5.3 How to write a chip card with SIMATIC Logon

Introduction

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

Requirements

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

Procedure

1. In the submenus **SIMATIC** and **SIMATIC Logon** of the Windows Start menu, select the menu command **Edit Smart Card**.
   The "SIMATIC Logon Service - Edit Smart 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:" text box to enter the user.
4. Go to the "Password:" text box to enter the password.
5. Go to the "Confirm password:" text box to enter the password.
6. Click "Write data to chip card".
   The "SIMATIC Logon Service – Smart card reader" dialog box opens.
7. Click "OK".

Additional information

- Online help of *SIMATIC Logon*

8.6 Local operator permission

Overview

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

The enabling and disabling of operations affects all parameter operations of a block in the AS which are performed in the views of the given faceplate.

Local operator permission is a higher-level operator permission.

It is determined before the following user permissions:

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

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

Note

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

Additional information

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

Creating Process Images - Basics

9

9.1 Process Pictures on the OS

Process Pictures

You can visualize the entire plant or a plant unit using process pictures, thereby enabling plant operators to 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.

Note

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

You can only manage the pictures exclusively in the Graphics Designer if they are not directly related to the plant hierarchy. 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.

9.2 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
Creating process pictures outside the plant hierarchy If you create process pictures outside the plant hierarchy in the Graphics Designer, the plant operator can call up these pictures and work with them in process mode using the "Picture by name" function without an authorization check. Therefore, configure special permissions for these pictures.

Additional information

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

9.3 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.

9.4 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.

Note

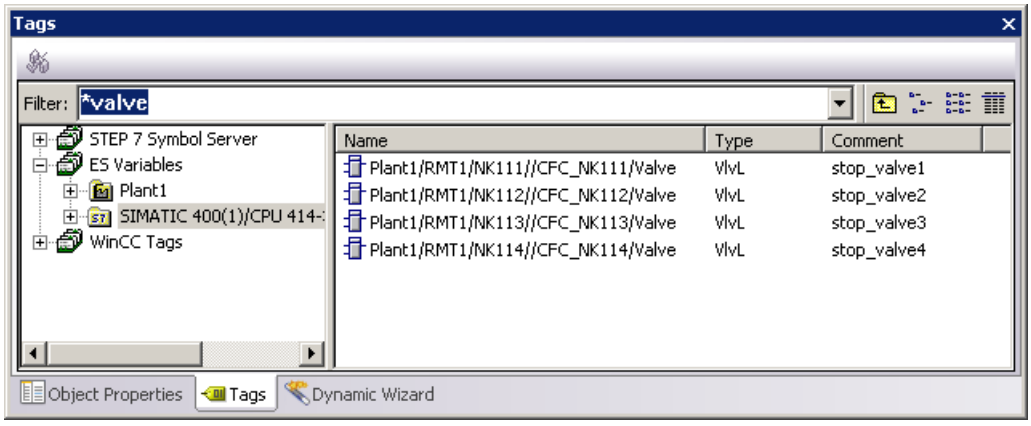
The use of numerous or extensive C actions and/or VBS actions increases the system load which can have a negative influence on picture-call times in runtime.

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

9.5 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 tag management

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 in-stance	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.

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

9.6 Configuring and Storing Tags in WinCC

Managing the tag management

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

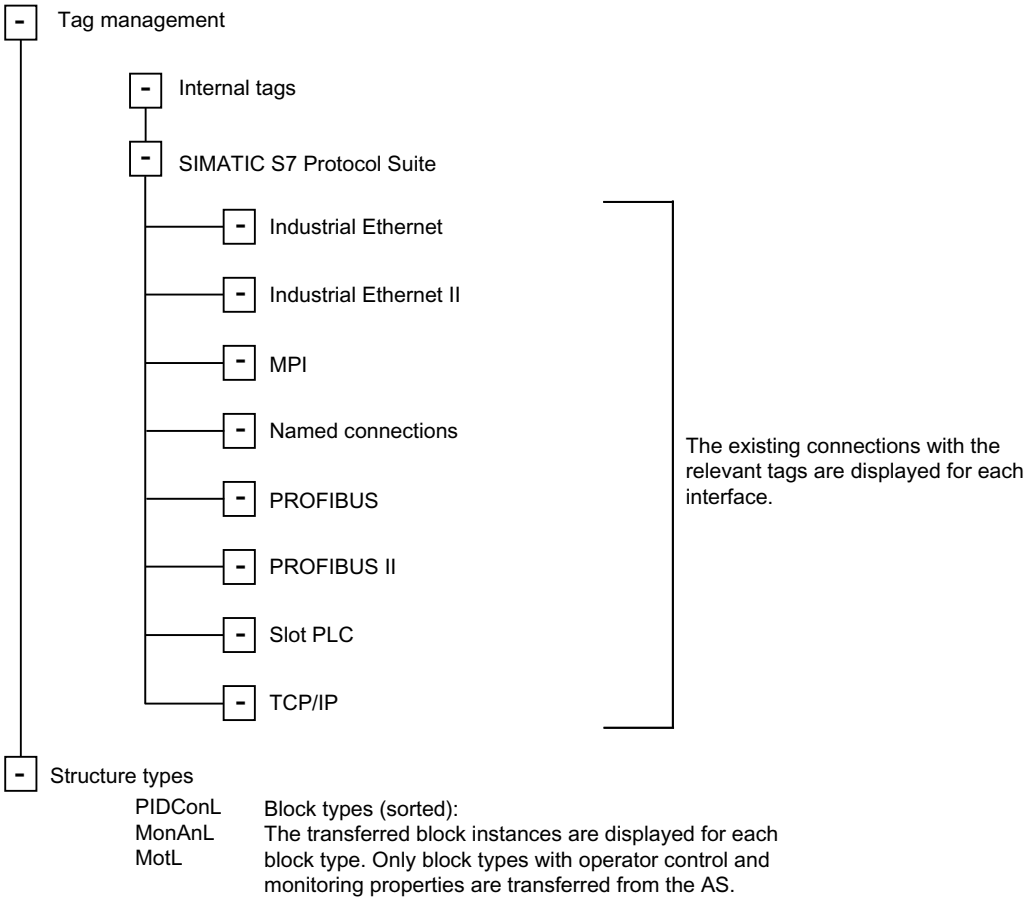
- Channels
- Logical connections
- Process tags
- Internal tags
- Tag groups

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

Tags from SIMATIC Manager are stored in the tag management.

PCS 7 and tags in WinCC

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



9.7 Tag name

Length of tag 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".

9.8 Dynamic PCS 7 Standard Objects

Introduction

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

Overview of dynamic PCS 7 standard objects

The primary objects are introduced briefly below:

Object	Function
I/O fields	I/O fields function as follows: • They display current process values. • The plant operator can enter values directly during runtime. You can use this field as follows: • As an input field • As an output field • As a combined input/output field
Status display	You can use 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.

9.9 Dynamic, custom objects

Introduction

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

Overview of dynamic, custom objects

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

Object	Function
Faceplate (Page 155)	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 156)	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 168)	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 176)	You can create user object templates on the basis of a user object. The advantage of user object templates is that you can make changes centrally to the user object template, and all the instances are then updated accordingly at once.

9.10 Configuring dynamic objects

9.10.1 Overview of Configuration Tasks for Dynamic Objects

Overview of the configuration steps

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

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

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

Step	What?
1	Open the process picture in the Graphics Designer (Page 122)
2	Inserting the dynamic object (Page 122)
3	Configuring the dynamic object (Page 123)
4	Defining the object properties (Page 123)

Additional information

- Online Help for *WinCC Information System*

9.10.2 How to Open a Picture in the Graphics Designer

Procedure

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

If …	… then
You are in SIMATIC Manager…	1. Open the plant view. 2. In the detail view, select the picture you want to edit in the Graphics Designer. 3. Select the **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.

9.10.3 How to Insert a Dynamic Object

Procedure

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

9.10.4 How to Specify the Object Properties

Procedure

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

9.10.5 How to Configure a Dynamic Object

Introduction

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.

If …	… then ...
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
Group display	You can find additional information about inserting and configuring a group display in the section "Overview of the Group Display (Page 141)".
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 126)".

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".

9.11 Configuring a status display

9.11.1 Configuring a status display

9.11.1.1 Working with a Status Display

Status display

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

9.11.1.2 How to Configure a Status Display

Introduction

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

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

Configuring a status display with standard pictures

The following is an overview of the configuration tasks.

Step	What?
1	Dragging the "Status display" object from the object palette onto the workspace
2	In the "Status Display 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 "Status Display Configuration" dialog box: interconnect the status display with the corresponding tag, and the states with the corresponding pictures

9.11.2 Configuring an extended status display

9.11.2.1 Overview of the Extended Display

Extended status display

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

Setting parameter and connecting tags

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

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

Import/export function

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

Example: Changing the valve representation

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

Step	What?
1	Configure the status display for the horizontal valve representation: • Define all operating and alarm states. • Assign associated pictures (e.g. EMF files) Note: Read section "How to configure block icons with custom pictures (Page 164)".
2	Export the configuration to an XML file.

Step	What?
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.

9.11.2.2 Working with the Extended Status Display

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

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

Defining operating and alarm states

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

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

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

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

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

- Attributes "Status1" ; "Status2" ; "Status3" ; "Status4"
  Recommendation:
  Interconnect the PCS 7 structure tag "Status(x)" with the status attributes for the operating states.
  You can find information on this in the section "How to determine the operating states from the status word assignment (Page 128)".
- "Group value" attribute
  Recommendation:
  Interconnect the PCS 7 structure tag "EventState" of the object for the alarm states (e.g. for a valve: Chart_name/Object_name.EventState...).
  You can find information on this in the section "Information about the operating states (Page 129)".

Overview of the Steps in Configuration

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

Step	Content
1	Determining the bits for operating states (Page 128)
2	Determining the bits for alarm states (Page 129)
3	Preparing the extended status display (Page 130)
4	Inserting the extended status display (Page 133)
5	Linking the tags (Page 133)
6	Configuring the extended status display (Page 134)
7	Displaying your own pictures in the extended status display (Page 136)

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

Introduction

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

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

Information in the online help of the block type

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

Information about the operating states

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

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.
4. Determine the needed bits.
   Example:
   Block type VlvL; Status word assignment for the structure tag "Status2"
   Status bit 20: Operating status: 1 = Valve open

9.11.2.4 Information about the operating states

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

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

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

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

Note

EventState tag

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

PCS 7 tag "EventState"

The individual bits of this tag are interpreted as follows:

Status information of the PCS 7 tag "EventState":

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

Acknowledgment information of the PCS 7 tag "EventState":

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

9.11.2.5 How to plan the representation of the extended status display

Introduction

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

Example: Planning the extended status display for a valve

The following states are to be displayed:

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

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

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

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

Information about the states

- The alarms states are mapped in the OS via the PCS 7 structure tag "EventState". You can find information about this in the section "Information about the operating states (Page 129)".
- The operating states are mapped in the OS via the PCS 7 structure tag "Status(x)". You can find information on this in the section "How to determine the operating states from the status word assignment (Page 128)".

Procedure

1. Determine the signals which you want to use to clearly represent the desired states based on the operating and alarm states.
2. Create a table where you enter the possible states.
   Example: See "Result"
3. In the table, enter the pictures to be displayed in process mode for the combinations of the states.

Result

The table for the example is shown below:

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

Recommendation:

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

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

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

Additional information

Online help *WinCC Information System*

9.11.2.6 How to Insert an Extended Status Display

Procedure

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

9.11.2.7 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. Select the "Properties" tab. Define the following settings for the "Others" property:
   - "Group value" attribute
     Recommendation:
     Interconnect the structure tag "EventState" of the object for the alarm states (e.g. for a valve: Chart_name/Object_name.EventState etc.).

     Note

     Structure tag "EventState"

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

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

9.11.2.8 How to Configure an Extended Status Display

Procedure

1. Open the "Properties of the extended status display" configuration dialog box.
   - If you have just inserted the extended status display, the configuration dialog box will already be open.
   - If you wish to make later changes to the configuration, open the shortcut menu for the selected status display and select the command **Configuration dialog box.** The "Properties of the extended status display" dialog box opens.
2. Open the "General" tab.
3. Make the following settings in the "Bit selection for status value processing" group:
   Select the desired status words from the drop-down list.
   Enter the status word bit to be used in the corresponding "Bit no." input box.
   You can find information on this in the section "How to determine the operating states from the status word assignment (Page 128)".
4. If you want to display an alarm evaluation in the representation of the status display, select the "Use group value for display" check box.
   The use of this option corresponds to the PCS 7 standard.
5. Make the following settings in the "Evaluation of the group value" group:
   - In the "Used bits" lists, set the bits that you want to use to represent the alarm evaluation. Additional information is available in the section "Information about the operating states (Page 129)".
     The default assignment corresponds to the PCS 7 standard. Use the arrow keys to move a selected bit between the two lists.
   - Set the order of the priorities of bits used for the evaluation of the group value.

   Note

   Setting the priority

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

8. In the index list, click on the state to which you want to assign pictures.
   The file selection list displays picture files.
   - Picture files of the selected file type from the project folder "GraCS".
     If a folder is specified in the "Use folder for pictures:" input box, the picture files stored there are displayed.
     You can find information on user-defined pictures in the section "How to insert custom pictures in an extended status display (Page 136)"
   - You can use the file filter to find file names more quickly.

   Note

   Assigning a picture

   Double-click the desired picture file.
   - The first double-click assigns the basic picture and the second double-click assigns the flash picture.
     If a flash picture is configured, the display changes between the basic picture and flash picture.
   - If you want to delete a picture for a state, select the state in the table and select the appropriate menu command from the context menu.
9. Click the "OK" or "Apply" button. The settings will be accepted.
10. Repeat steps 7 through 9 for all the combinations for which you wish to specify pictures.
11. Click "OK".

9.11.2.9 Folder for custom pictures

Using custom pictures

- As of PCS7 8.1, the "PCS7CustomPictures" folder is automatically created in the "GraCS" project folder when the project editor is opened.
  - The "PCS7CustomPictures" folder is the default folder for the files of custom pictures.
  - You can create additional folders in the "GraCS" project folder for custom pictures.
- You can configure the representation of custom pictures of APL block icons in the properties of the APL block icons:
  "Configurations > "Folder for pictures" attribute

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

Note

Software update as of PCS 7 V8.1

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

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

Recommendation

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

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

Additional information

Section "How to insert custom pictures in an extended status display (Page 136)"

9.11.2.10 How to insert custom pictures in an extended status display

Extended status displays and block icons can be configured so that custom pictures are displayed in process mode.

If only the displayed object symbols are to be changed for APL block icons, select the procedure that is described in the section "How to configure block icons with custom pictures (Page 164)".

Objective: Custom presentation of the "Motor" block icon

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

The block icon is to be adapted so that custom symbols for a pump are displayed in process mode.

The block icon is to be supplemented by additional objects.

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

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

Precondition

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

Procedure for example

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

   Note
   Editing

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

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

   Note

   Read section "Folder for custom pictures (Page 135)".

   In the input box "Use folder for pictures:" enter the name of the folder where the files of the custom pictures are located.

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

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

Additional information

Section "Creating and implementing user objects (Page 168)"

9.12 Configuring an Extended Analog Display

9.12.1 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.

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

Overview of the configuration steps

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

Step	Content
1	Insert the extended analog display (Page 138)
2	Configure the extended analog display (Page 139)
3	Link the tags (Page 139)

9.12.2 How to Insert an Extended Analog Display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbar**
   - In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.

3. In the "Standard" dialog box, select the object "Analog Display (extended)" in the tree view in the "Smart Objects" folder.
4. Move the mouse pointer to the drawing area.
   The mouse pointer becomes a small status display cursor.
5. Hold down the mouse button and draw a rectangle of the size of the extended analog display.
   The "Extended analog display properties" configuration dialog opens.

9.12.3 How to Configure an Extended Analog Display

Procedure

1. Open the "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".

9.12.4 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.

9.13 Configuring an input/output box

9.13.1 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

9.13.2 How to configure an input/output field

Introduction

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

Note to Reader

The following is an overview of the configuration 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.

9.14 Configuring group displays

9.14.1 Overview of the Group Display

Introduction

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

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

Group display in process pictures

The group display enables you to display the message status of a process tag directly in the process picture. From each group display, the plant operator can switch to other process pictures or 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 in the WinCC "Picture Tree Manager" editor with "Recalculate the group display hierarchy completely while saving" check box selected
  You use this update when you simulate process mode from SIMATIC Manager on the Engineering Station.
- When starting the Project Editor with the "Create/update group displays" check box activated

Options for the dynamic updating of a group display

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

- Interconnecting the group display to a process tag (Page 147)
  You connect the group display to a block in a process tag or control module to enable the display of messages from the assigned block to the plant operator in process mode.
- Interconnecting group displays with pictures (Page 149)
  You connect the group display to a picture so that messages from the picture are displayed in process mode.
- Picture selection with group display (Page 152)
  You connect the group display to a picture so that if there is an incoming message, the plant operator can switch directly to the picture in which the message was generated. This function can be used to update both a group display and other picture objects.

9.14.2 Displaying a Group Display in Process Mode

Introduction

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

The figure below shows an example group display.



The following message types are distinguished and preset to defaults:

Message type	Field in the group display	Class
Process alarm	1	• A (AH, AL): – Alarm high, Alarm low – white text on a red background – flashing if 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
Operator control display	4	• O (OR): – Operator prompt – 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 *WinCC Information System*

9.14.3 Configuring a group display

9.14.3.1 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. By default, the group display shows five buttons.
  The message types are assigned to a button using a bit number from the "EventState" tag. 16 different message types, which can 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.

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

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

Bit in the "Event State" tags	Associated message type	Bit number
23 7 – acknowledge bit	MR, preventive maintenance	9
22 6 – acknowledge bit	PM, process message	10
21 5 - acknowledge bit	PM, operating message	11
20	OR, operator request	12
19	OM, operator input message	13
18	AS, AS status message	14
17	OS, OS status message	15
16	X, 'out of service' message	16

M - preventive maintenance

SA – AS status

SO – OS status

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

9.14.3.2 How to Insert a Group Display

Procedure

1. Open a process picture in the Graphics Designer.
2. If the "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbars**
   - In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.
3. In the "Standard" dialog box, select the object "Group display" in the tree view in the "Smart Objects" folder.
4. Use the mouse to navigate to the drawing area.
   The mouse pointer changes to a group display cursor.

5. Holding the mouse, drag open a rectangle large enough to accommodate your group display.
6. Configure the group display.
   You can find additional information on this topic in the section "How to Configure a Group Display (Page 146)".
7. Create the connection by means of a wizard:
   – If you wish to connect the group display to a block, start the "Connect a Group Display to a PCS 7 Process Tag" wizard.
     You can find additional information on this topic in the section "Interconnecting the group display to a process tag (Page 147)".
   – If you wish to connect the group display to a picture, start the "Connect a Group Display to a Picture" wizard.
     You can find additional information on this topic in the section "Interconnecting group displays with pictures (Page 149)".
8. Open the shortcut menu for the object and select the menu command **Properties**.
   The "Object properties" dialog box opens.
9. Specify the parameters for the group display.

Additional information

For additional information, refer to the online help for the *WinCC Information System*.

9.14.3.3 How to Configure a Group Display

Requirement

The group display has been inserted in the process picture.

Procedure

1. Open the shortcut menu for the group display and select the menu command **Properties**.
   The "Object Properties" dialog box opens.
2. Select the "Properties" tab.
3. Select the property "Group display > Geometry" in the tree view.
4. 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.

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

6. Double-click the attribute "Message types".
   A list is shown with all the available message types.
   You can find additional information in the section "Configuration Options for a Group Display (Page 144)".
7. Select the message type which you wish to configure and click "OK".
8. Perform the corresponding settings for display in process mode.
9. Follow this procedure for all the message types which you wish to show in process mode.
10. Select the property "Group display > Assignment" in the tree view.
11. Double-click the attribute "Message types for button [serial number of the button]".
    The "Text Input" dialog box is opened.
12. Use the bit to select the message type which you wish to assign to the button.
13. 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 144)".
14. Click the title bar and select the command **Close** in the shortcut menu.

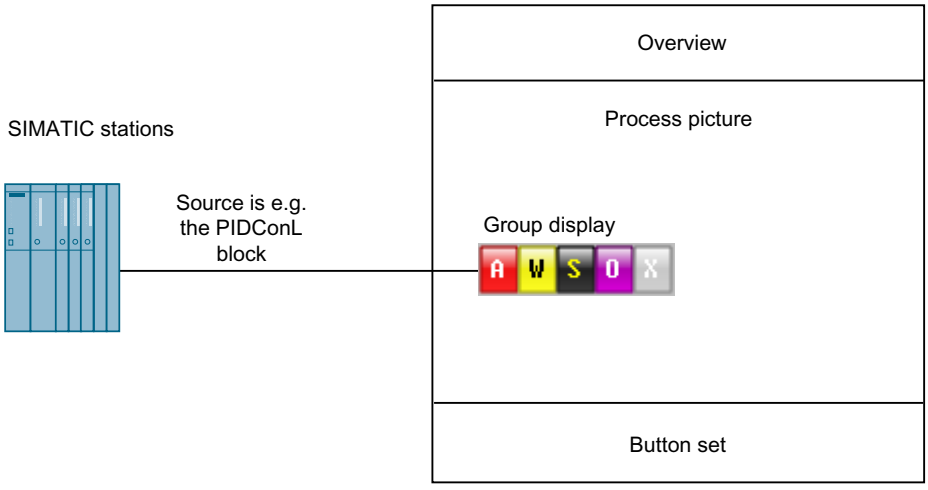
9.14.4 Interconnecting the group display to a process tag

9.14.4.1 Interconnecting the group display to a process tag

Overview

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

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".



Make the connection with the dynamic wizard "Connect a Group Display to a PCS 7 Process Tag".

The block can be configured as follows, for example:

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

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

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

   Note

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

9. Click "Next".
   The "Finished!" step opens.
10. Check your settings.
11. Click "Finish".
    The group display has been linked to a block.

9.14.5 Interconnecting group displays with pictures

9.14.5.1 Interconnecting group displays with pictures

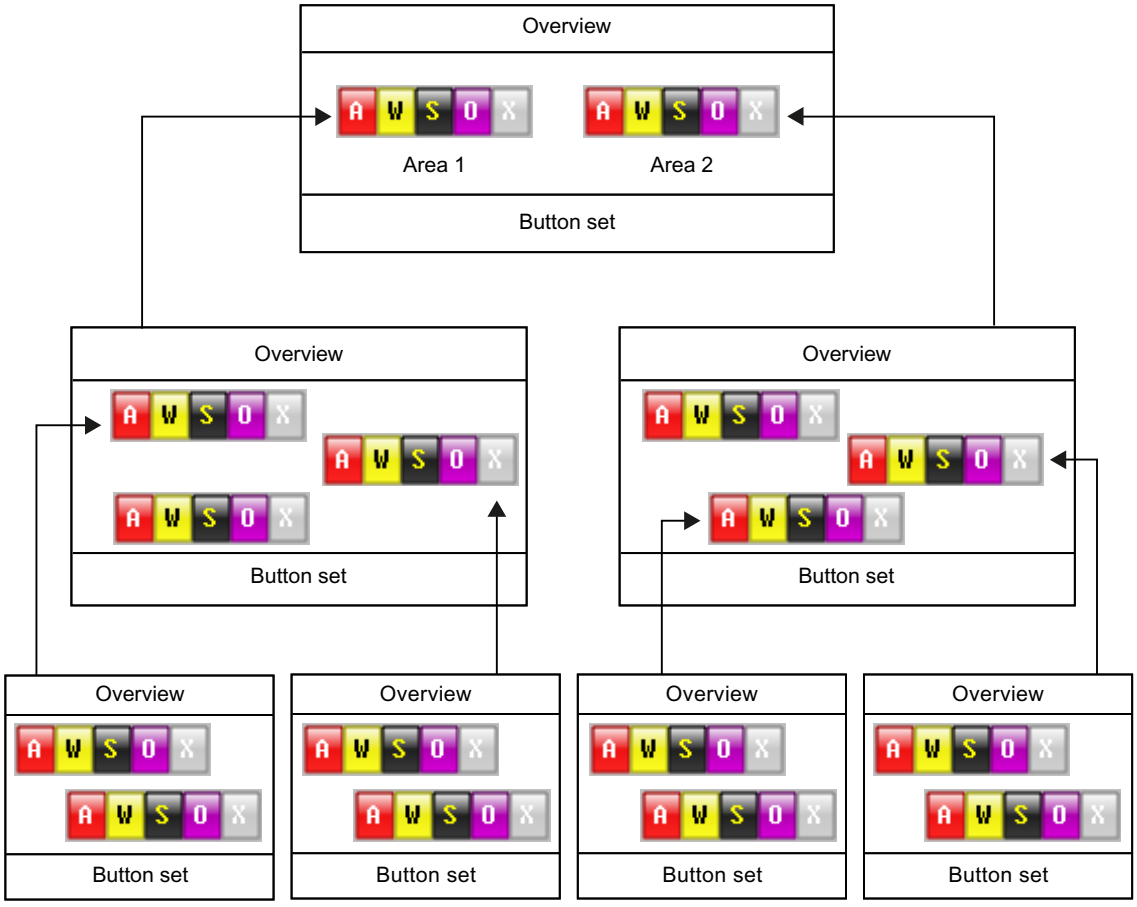
Introduction

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

Function in process mode

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

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



Picture hierarchy

For process control within the OS a picture hierarchy is needed, 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 in accordance with 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 Online Help for the *WinCC Information System*.

9.14.5.2 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.

Additional information

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

9.14.5.3 How to interconnect a group display with a picture

Requirements

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

Procedure

1. Open the process picture in the Graphics Designer.
2. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbars**
   - In the submenu, select the "Dynamic Wizard" check box.
     This "Dynamic Wizard" dialog box opens.
3. Select the required group display in the process picture.
4. In the "Dynamic Wizard" dialog box, select the "Standard Dynamics" tab.
5. Double-click the entry "Connect group display to picture".
   The wizard is opened.
6. Click the "Next" button in the first step of the wizard.
   The "Set options" step is opened.
7. Click "Browse" next to the input box in the "Set options" step.
   The "Picture browser" dialog box opens.
8. Select the desired picture and click "OK".
   The picture is applied.
9. Click "Next".
   The "Finished!" step opens.
10. Check your settings.
11. Click "Finish".
    The group display is connected to the picture.
12. Finally, define the event which is to be used to call up the picture, for example, a right mouse click.
    There is additional information available on this in the section "How to Define the Type of Picture Selection (Page 152)".

9.14.5.4 How to Define the Type of Picture Selection

Requirements

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

Procedure

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

Creating process pictures - advanced 10

10.1 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.

10.2 Function and Use of Block Icons and Faceplates

10.2.1 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

Where:

Name of the project directory: …\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".

10.2.2 Relationship between Faceplates and Block Icons

Standard block icons

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



Using block icons

There are two options for using block icons:

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

You can find background information about the "Create/Update Block Icons" function in the section "Procedure for Creating Block Icons (Page 67)".

See also

Block Icons and the @PCS7TypicalsAPL<Version> file (Page 157)

Block icons and the @TemplateAPL<Version>.pdl file (Page 159)

Rules for using multiple template files (Page 159)

10.2.3 Block Icons and the @PCS7TypicalsAPL<Version> file

Overview

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

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

Information on using multiple templates for block icons is provided in the section "Rules for using multiple template files (Page 159)".

Changes to the "@PCS7TypicalsAPL<Version>.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, create your own block icons for this.

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

Different versions of block icons

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

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

1. Open the "@PCS7TypicalsAPL<Version>.pdl" file.
2. Highlight the block icon and then select the menu command **View > Properties**.
   The "Object properties" dialog box opens.
3. Select the "General" property from the tree view.
   The associated attributes are displayed.

Additional information

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

10.2.4 Block icons and the @TemplateAPL<Version>.pdl file

Overview

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

Information on using multiple templates for block icons is provided in the section "Rules for using multiple template files (Page 159)".

Manually inserting block icons

If you wish to manually insert additional block icons into a process picture, and these are not automatically derived from the plant hierarchy, you must use the file "@TemplateAPL<Version>.pdl":

If, for example, you want to show an additional process tag in a process picture. This block icon will be deleted the next time the "Create/Update Block Icons..." function is executed, since the process tag is not located at the required position in the plant hierarchy. You can only prevent this block icon from being deleted by using a block icon from the "@TemplateAPL<Version>.pdl" file.

Note

If you have changed the block icons in the "@TemplateAPL<Version>.pdl" file, you need to create a backup copy before you update the PCS 7 software, because this file is overwritten.

Recommendation
If you want to amend existing block icons, copy the desired block icon to the "@TemplateAPL<Version>.pdl" file in the new file and adapt it there.

10.2.5 Rules for using multiple template files

A PCS 7 project contains the following standard template files:

- @TemplateAPL<Version>.pdl
- @PCS7TypicalsAPL<Version>.pdl

The files basically contain the same block icons. The most important difference between the block icons contained in the files is the value for the "type" attribute. This value indicates assignment to the AS program libraries.

Default templates

Two versions each of this file are installed as of PCS 7 V8.0:

- "@TemplateAPLV8.pdl" and "@PCS7TypicalsAPLV8.pdl":
  This file is used by default as of PCS 7 version 8.0 and contains the latest block icons for version 8.1.
- "@TemplateAPLV7.pdl" and "@PCS7TypicalsAPLV7.pdl":
  This file contains the block icons of PCS 7 version 7.1.

Note

Using the template picture for V7 or V8 block icons

You can use the "@PCS7TypicalsAPLV7.pdl" template picture if the following preconditions are met:

- You do not want to use new functions from PCS 7 V8.1
- You do not want to use the latest block icons from the "@PCS7TypicalsAPLV8.pdl" template picture for updating the picture objects, for example, because the icon sizes have been changed

The "@PCS7TypicalsAPLV8.pdl" file needs to be renamed or deleted in order to use the "Create/Update Block Icons" function and compiling processes of this "@PCS7TypicalsAPLV7.pdl" template picture in subsequent executions. Renamed files must not start with the following characters:

- @PCS7Typicals
- @TemplateAPL

Recommendation:

Always use the same versions of the "@TemplateAPL<Version>.pdl" and "@PCS7TypicalsAPL<Version>.pdl" files for a PCS 7 project.

What templates are applied?

The "Create/Update Block Icons" function first searches for used or newly inserted block icons in @PCS7Typicals<XYZ>.pdl template pictures.

A block icon can be contained in several template pictures (for example, in the template files of the PCS 7 versions).

If you want to check to what block icon the "Create/Update Block Icons" function can be applied, proceed as follows:

1. Open the "GraCS" project folder in the Windows Explorer.
2. Sort the file names in reverse alphabetical order (Z-A 9-0).
3. The template picture shown first in this order (@PCS 7Typicals<XYZ>.pdl), in which the block icon is present, is used by the "Create/Update Block Icons" function.

Note

Project editor copies template files

The current template files are copied to the project when the project editor is opened.

If you are not using the current template files, you must ensure that the required templates are used in the project after opening the project editor. Delete the current template files in the project if they are not required.

See also

Relationship between Faceplates and Block Icons (Page 156)

10.2.6 Display Types of Faceplates

Introduction

When you connect any object from the object palette of the Graphics Designer to a process tag, you must specify a suitable display type.

Display types of faceplates

The following options are provided in the wizard to set up this connection:

Display type	Description
Loop display	This display type shows all possible views, such as standard, alarm, or limits, simultaneously and arranged horizontally. Possible layout of the loop display: • Loop > Working area This representation fills the entire working area. The faceplate cannot be moved or resized. The faceplate is deselected by opening a new process picture using a button in the overview area. • Loop > Process window The representation is placed in a separate window that opens in addition to the process picture. The plant operator can move this window, change its size and close it.
Group display	The representation is placed in a separate window that the plant operator can move and close. Compared to the loop, only one view is active here at a given time. The plant operator can switch to a different view using a drop-down list. The plant operator can switch from the group display to the loop display in the process window by clicking a button.

10.2.7 Overview of Block Icon and Faceplate Configuration Tasks

Introduction

If you want to manually insert block icons into your process pictures in addition to those generated automatically and want to connect them to a process tag, you have several options for doing this:

Option 1

In general, you will use this option.

Step	What?
1	How to Insert a Block Icon (Page 162)
2	How to connect a block icon to a process tag (Page 162)

Option 2

In exceptional cases, you can use the following procedure:

Step	What?
1	How to Connect an Object to a Faceplate (Page 163)

10.2.8 How to Insert a Block Icon

Procedure

1. Open the process picture in the Graphics Designer.
2. Also open the picture @Template.pdl.
   The various technological block icons are provided as a template in this picture.
3. Select the desired block icon in this picture and then select the menu command **Edit > Copy**.
4. Now switch to the process picture and select the menu command **Edit > Paste**.
   The block icon is inserted into your process picture. It is not yet connected to a process tag.

10.2.9 How to connect a block icon to a process tag

Requirement

The block icon is available in the process picture.

Procedure

1. Open the process picture in the Graphics Designer.
2. If the "Tags" dialog box ("Tags" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Variables" check box.
   The "Tags" dialog box opens.
3. Select the desired block icon in the process picture.
4. In the "Tags" dialog box, navigate under "ES Variables" to the CFC chart that contains the desired process tag.

   Note

   The detail window only shows the process tags that are suitable for the selected block icon.

5. Drag the desired block from the detail window and drop it on the associated block icon.
   The block icon is automatically connected to all the required tags of the process tag.
6. Repeat steps 3 to 5 for all the other block icons.
7. Save and close the process picture and then close the @Template.pdl file.

10.2.10 How to Connect an Object to a Faceplate

Introduction

You usually work with the block icons provided by PCS 7. In special cases, you can use other picture objects.

Requirement

A picture object has been inserted in the process picture.

Procedure

1. Open the process picture in the Graphics Designer.
2. Select the required picture object.
3. If the "Dynamic Wizard" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Dynamic Wizard" check box.
   This "Dynamic Wizard" dialog box opens.
4. In the "Dynamic Wizard" dialog box, select the "Picture Functions" tab.
5. Double-click "Picture selection via measurement point" in the list.
   This "Welcome to the Dynamic Wizard" dialog box opens.

6. Click "Next" in the first step of the wizard.
   The "Select trigger" step opens.
7. Select the desired trigger.
   In this way, you define the event by which the plant operator opens the faceplate in runtime.
8. Click "Next".
   The "Set options" step opens.
9. In the "Set options" step, select the desired tag structure type in the list and click "Next".
   The "Set options" step opens.
10. Click the "Browse" button beside the input box.
    The tag selection dialog opens, showing you the process tags corresponding to the preselected structure type.
11. Select the desired process tag in the detail view and click "OK".
    The process tag is applied and the tag selection dialog closes.
12. Select the option button of the desired display type.
    You can find additional information about this in the section "Display types of faceplates (Page 161)".
13. Click "Next".
    The "Finished!" step opens.
14. Check your settings and click "Finish".
    The picture object is connected to the desired process tag.

10.2.11 How to configure block icons with custom pictures

Symbols are included in the block icons for the AS blocks that represent the states of an object, for example, "Motor On".

You can configure APL block icons so that custom pictures are displayed for these symbols in process mode (for example, other colors, other symbols).

The following adaptations are possible:

- Adapt all block icons of a type
- Adapt selected block icons

Displaying custom pictures in APL block icons

- As of PCS7 8.1, the "PCS7CustomPictures" is automatically created in the "GraCS" project folder when the project editor is opened.
  - The "PCS7CustomPictures" folder is the default folder for the files of custom pictures.
  - You can create additional folders for custom picture files in the "GraCS" project folder.
- You can configure the folder for the files of the custom pictures in the properties of the APL block icons for the representation in process mode:
  "Configurations > "Directory for pictures" attribute

- **The default is "PCS7CustomPictures"**
  If no value is configured for the "Directory for pictures" attribute and the OS project is compiled, the following applies:
  The default value "PCS7CustomPictures" is entered for the "Directory for pictures" attribute if no value is configured for the instances of APL block icons.
- **Names of files for custom pictures - same name required:**
  The files must have the same names as the files of the corresponding pictures files for APL block icons.
- Display in process mode:
  - The custom pictures are displayed if they are in the folder that is entered in the "Directory for pictures" attribute of the block icon.
  - The standard pictures are displayed if the configured "Directory for pictures" contains no picture file with the standard name.

Note

Software update

For custom APL block icons to remain unchanged when the software is updated, the following requirements must be met:

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

Example

Objective:
Custom presentation of the "Motor" block icon. The APL block icon is adapted so that the colors of the states are exchanged in process mode.

Method:
An extended status display is integrated in a "Motor" block icon. The pictures of the extended status display are to be replaced.

State	Original representation		Target representation	
	Picture file	Color	Picture file	Color
Motor ON	apl_bi_MotL_on.emf	Green	apl_bi_MotL_on.emf	red
Motor OFF	apl_bi_MotL_off.emf	Gray	apl_bi_MotL_off.emf	Green
Motor defective	apl_bi_MotL_err.emf	red	apl_bi_MotL_err.emf	Gray

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

"Adapt all block icons of a type" procedure

1. Open the "GraCS" project folder in the Windows Explorer.
2. Copy the picture files that you want to adapt into the subfolder "PCS7CustomPictures".
3. Change the picture files in the subfolder "PCS7CustomPictures" so that the files show the desired representation (Replace/Change).

   Note

   The name of the picture files must be maintained.

   The export function of the Graphics Designer is **not** suitable for changing the picture files. To create the EMF files, use a graphics program that can create vector graphics. Note the dimensions of the original pictures.

Result: The representation is changed for all block icons.

"Adapt selected block icons" procedure

1. Open the "GraCS" project folder in the Windows Explorer.
2. Create a separate subfolder in the "GraCS" project folder (for example, the subfolder "Pump_Typx")
3. Copy the picture files that you want to adapt into the subfolder you created in the "GraCS" project folder.
4. Change the picture files in the subfolder you have created ("Pump_Typx") so that the files show the desired representation (Replace/Change, e.g. show the appropriate pump symbol).

   Note

   The name of the picture files must be maintained.

   Do **not** use the export function of the Graphics Designer to change the picture files.

5. In the Graphics Designer, open the picture in which the block icon is used.
6. Open the properties of the block icon.
7. Select the "Configurations" item in the tree view.
8. Enter the name of the subfolder you have created ("Pump_Typx") in the "Directory for pictures" input box.

Result:
The representation is changed for the selected block icons.

If you change a template file, the change is applied to all new instances of this block icon.

Additional information

Section "How to Configure an Extended Status Display (Page 134)"

10.3 Displaying messages

10.3.1 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 message system (Page 197)"

10.3.2 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 "Controls" dialog box ("Controls" tab) is not visible, perform the following steps:
   – Select the menu command **View > Toolbars**
   – In the submenu, select the "Controls" check box.
   The "Controls" dialog box opens.
3. Select the "Controls" tab.
4. Open the ActiveX Controls folder.
5. Select the WinCC Alarm Control.
6. Move the mouse pointer to the drawing area.
   The mouse pointer changes according to the selected object.
7. Hold down the mouse button and draw a rectangle matching the size of your object.
   The "WinCC Alarm Control Properties" dialog box opens.
8. Set the "WinCC Alarm Control" properties.
   Information about the individual input boxes and check boxes is available in the *WinCC Information System* online help.

9. Click "OK".
   The "WinCC Alarm Control Properties" dialog box closes.
10. In the shortcut menu of the AlarmControl, select the menu command **Properties** to define the properties and events.
    The "Object Properties" dialog box opens.
    You can find additional information about the individual input boxes and check boxes in the online help *WinCC Information System*.
11. Define the properties and events.
    Additional information about the individual input boxes and check boxes is available in the *WinCC Information System* online help.
12. Close the "Object properties" dialog box.

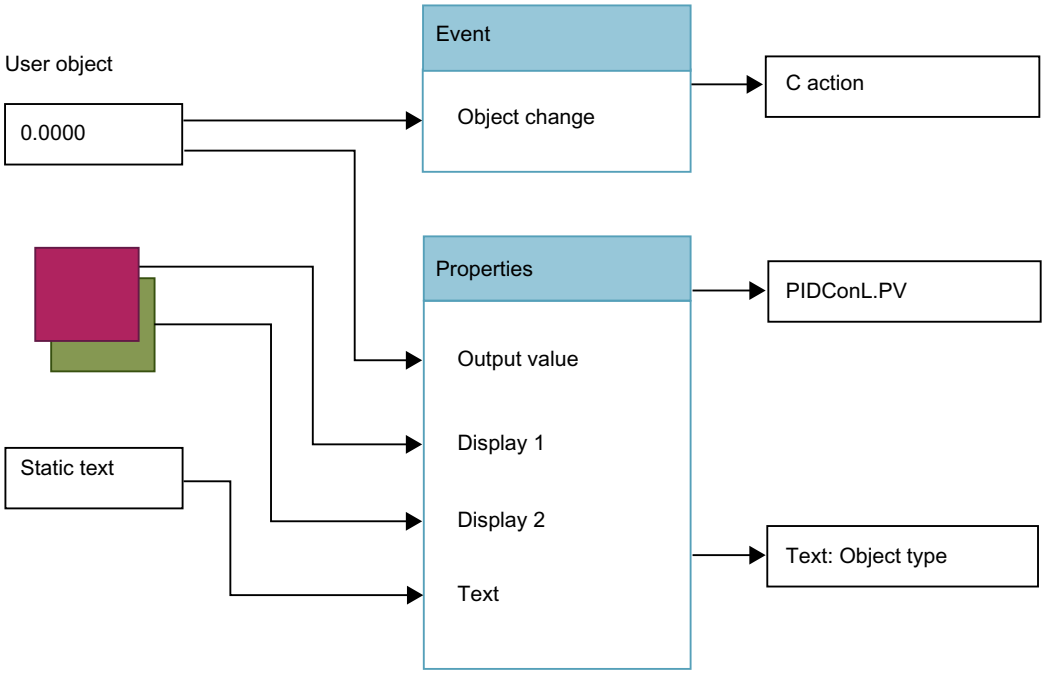
10.4 Creating and implementing user objects

10.4.1 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. Afterwards, you can use the user object again repeatedly without having to configure each single object again and combine them into an object for every use.

Only those properties that are required for the user object are visible for each single object. You can variably set parameters for these properties and make them dynamic. Since only a selection of properties are visible due to your settings, connection to the tags is made easier. These properties can also be accessed from other WinCC applications, such as scripts.



Area of application of user objects

It is useful to create your own user object in the following situations:

- You want to show the plant operator information on certain technological blocks in process mode which is not offered by standard faceplates.
- You have created a custom block type by compiling a CFC chart in the CFC editor.

Storing the user objects for multiple use

Store user blocks in a library in order to facilitate multiple use. User objects which you remove from a library are copies of the originals. This means that, if required, you can individually change and adapt each copy subsequently without these adaptations being overwritten every time the original is changed.

Note

As standard, displaying a faceplate by clicking on a user object is not possible.

10.4.2 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*

10.4.3 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 170)
2	Configuring a user object (Page 171)
3	Configuring user object properties (Page 173)
4	Storing a user object in a library so that it can be reused (Page 174)
5	Inserting and instancing a user object in the process picture (Page 174)
6	When changes are made: Edit the user object (Page 176)

10.4.4 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.
   The program closes the configuration dialog. Linking variables will not take place until later.
4. Select the individual object.
5. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
6. Enter a short, self-explanatory name for the individual object at the "Object Name" attribute.
7. Specify all static properties, e. g. colors or font attributes.
   You make the user object dynamic in a separate step.
8. Click the title bar and select the command **Close** in the shortcut menu.
9. Repeat steps 2 to 7 for all the other individual objects.
10. Position the individual objects where they should appear in the user object.
11. Using the mouse, drag a frame around all the objects.
    All individual objects are selected.
12. Select the menu command **Edit > User object > Create**.
    The "User Object" configuration dialog opens. In this dialog box, select all properties that should apply to the entire user object.

See also

Creating a user object for user object template (Page 177)

10.4.5 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 293)".

   Note

   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.

    Note

    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".

10.4.6 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. You have already defined the static properties for the single objects.

Procedure

1. Select the user object.
2. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
3. Select the "User Object" entry in the tree view.
4. Switch to the detail window and enter a meaningful name for the user object at the "Object Name" attribute.
5. In the tree view, select the "User-defined" entry.
   All properties that you need for the user object have been saved under this entry during configuration of the user object.
6. Switch to the detail window and double-click in the "Dynamics" column at the desired attribute.
   A rectangle appears.
7. Enter the variable that is to be linked to the attribute here: Enter the variable name in a commonly used form: Place a dot before the variable name, e. g. ".PV_OUT".
8. Press the Enter key to confirm your entry.
   The variable is transferred to the "Dynamics" column and the color of the "Bulb" icon changes to green.
9. Repeat steps 5 to 8 to link variables to all the other attributes.

Note

Link the attribute "Group value" to "[Name of block].EventState".

Enter "Yes" at the attribute "Group-relevant".

10.4.7 How to Store a User Object

Procedure

1. Open the Graphics Designer.
2. Open the "Library" dialog box ("Library" tab). If the "Library" dialog box ("Library" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbars**
   - In the submenu, select the "Library" check box.
     The "Library" dialog box opens.
3. If you wish to create many user objects, select the object "Project Library" in the tree view and click the "New Directory" button. A new directory is created.
4. Select the newly created directory.
5. In the shortcut menu, select the menu command **Rename**.
6. Enter a meaningful name for the library.
7. In the process picture, select the user object that you wish to store in the library and select the menu command **Edit > Copy**.
8. Switch to the library and, in the tree view, select the directory in which you wish to store the user object.
9. Click the "Add" button in the library toolbar.
   The user object is stored in the library.
10. In the shortcut menu for the user object, select the menu command **Rename**.
11. Enter a meaningful name for the user object. Use the same name that you used already as the object name in the properties of the user object. This makes management of the user objects clearer.

10.4.8 How to Insert a User Object

Requirement

The "project library" contains the user object.

Overview of the configuration steps

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 the Graphics Designer.
2. Open the "Library" dialog box ("Library" tab). If the "Library" dialog box ("Library" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbars**
   - In the submenu, select the "Library" check box.
     The "Library" dialog box opens.
3. In the tree view select the directory in which you 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" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbar**
   - In the submenu, select the "Dynamic Wizard" check box.
     This "Dynamic Wizard" dialog box opens.
2. In the "Dynamic Wizard" dialog box, select the "Standard Dynamics" tab.
3. Double-click the entry "Connect prototype with a structure or rename existing prototype".
   The wizard is opened.
4. Click the "Next" button in the first step of the wizard.
   The "Set options" step is opened.
5. In the "Set options" step, click the "Browse" button next to the "Structure instance name" input box.
   The tag selection dialog box opens.
6. In the detail view, select the required block and click "OK".
   The required block is copied and the tag selection dialog is closed.

   Note

   If there are many tags, use the filter function in this dialog. For additional information, refer to the online help for the *WinCC Information System*.

7. Click "Next".
   The "Finished!" step opens.
8. Check your settings and click "Finish".
   In one step, the attributes of all properties are connected to a specific block.

10.4.9 How to Edit a 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.
   All individual objects are available for selection.

NOTICE
Never delete the user object Do not delete the user object under any circumstances, as all configurations would be lost in this case.

3. Click anywhere in the drawing pane.
   All selections are removed.
4. Select the individual object that you wish to edit.
5. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
6. Change the desired properties.
7. Using the mouse, drag a frame around all of the individual objects.
   All individual objects are selected.
8. Select the menu command **Edit > User Object > Finish editing...**.
   Editing is now finished.

10.5 Working with user object templates

10.5.1 Using and Creating User Object Templates

User object templates

User object templates are custom pictures in the Graphics Designer. You can create user objects directly in these pictures or insert them into the user object template from a library.

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 list compares user objects and the user object templates. Based on your requirements for an object, decide if you want to use a user object or a user object template.

User objects	User object templates
When you use a user object from a library, you create a copy of the user object. It is not possible to exchange these objects later.	When you use a user object template, you create an instance. You can change the template centrally and then pass the changes to all objects that are based on this template.
You can only edit one user object at a time 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 a central change

To be able to use the central editing function, the following requirements must be met:

- Each object that is based on a user object template has a type identifier. You therefore define a "Type" property in the properties of the user object template. This property is then passed to the instance of the user object template. This property is used by the wizard to identifies these objects.
- The user object templates are stored in a template file.

Recommendation:
You should insert custom block icons into user object templates. Save the user object templates in files with the naming convention @ PCS7Typicals<XYZ>.pdl. You can create a maximum of 10 template pictures in a project, for example @PCS7TypicalsVALVE.pdl; @PCS7TypicalsMOTOR.pdl.

10.5.2 Creating a user object for user object template

10.5.2.1 How to create a user object template (example)

You can create user objects that you can use, for example, to create your own block icons. To use your own picture as user object template for your own block icons, the contained picture objects must have defined properties.

The block icons in template picture @PCS7TypicalsAPLV8.pdl, for example, can be used as templates for the user objects. You should not change the default template pictures in PCS 7. These default template pictures are overwritten when the software is updated.

Required properties

You configure the relevant properties and attributes for the user object.

If there is no object with suitable attributes in the user object, you should add an additional object to the user object.

Property	Required	Purpose	Additional objects (type)	Properties
type	… if all functions of the Graphic Object Update Wizard are to be used	This property is used as identification when working with the individual wizards of the Graphic Object Update Wizard.	DataSet	Data format: String
servername	… if a faceplate is to be called	This property refers to the faceplate that can be called by mouse click from this user object.		Data format: String
tagname	… if a faceplate is to be called	This property assigns the designation of the instance with which the faceplate is to be called – this is the same as the variable prefix.		Data format: String
tag/ NameOfTag	no. Not mandatory and is also not supported by default.	This property is used to transfer fixed texts (E.g. code of the object). The entered character string can be displayed in the process picture.	I/O box	Data format: String

Recommendation

If you want to create your own reusable block icons from user objects, proceed as follows:

1. Copy the standard block icons from the @PCS7TypicalsAPL<Version>.pdl template picture to the user object template (your own template picture - e.g. @PCS7TypicalsVALVES.pdl). The functions of the standard block are then retained.
2. Adapt the block icons in the user object template.

Basic procedure

1. Create additional objects
   If you create additional objects, you can reuse the objects you have created.
   You can find information about this in section "How to create additional required objects (Page 179)".
2. Expand user object
   If there is no object with suitable properties in the user object, add the objects with the required properties to the user object.
   You can find information about this in section "How to add required objects to a user object (Page 179)".
3. Parameterize user object
   Enter the plant-specific properties for the user object.
   You can find information about this in section "How to parameterize the user object (Page 181)".
4. Save user object
   Save the user object in a picture.
   You can find information about this in section "Save (Page 181)".

10.5.2.2 How to create additional required objects

Procedure

1. Open the picture you have defined as user object template, in the Graphics Designer (e.g. @PCS7TypicalsVALVES.pdl).
2. Add the "DataSet" object to the picture.
   Only create this object if there is no object of type "DataSet" in the user object.
   The "DataSet Configuration" dialog box opens.
3. Click the "Add" button.
   A new entry is displayed in the list (name: Int<No>)
4. Select the entry in the "type" column. Select the "string" type from the drop-down list.
5. Click three times on the "Add" button.
   Three new entries are displayed in the list (name: String<No>)
6. Click "OK".
7. Add the "I/O box" object to the picture.
   Only create this object if a description of the user object should be displayed in process mode. The "I/O Box Configuration" dialog box opens.
8. Click "OK".
9. Select the entered "I/O box" object.
10. Make the following settings for the following attributes in the "Object properties" dialog on the "Properties" tab:

Property > Attribute	Entry
I/O box > Object name	NameOfTag
I/O box > Other > Display	Yes
I/O box > Output/Input > Data format	String

10.5.2.3 How to add required objects to a user object

Procedure

1. Select the user object.
2. Select the menu command **User object > Edit...**.
   This step is not required if the required objects are contained in the user object.
   You can find information about creating a user object in section "Auto-Hotspot".
   - Copy the required additionally created objects (DataSet; I/O box) to the area of the user object.
   - Adjust the size of the required additionally created objects.
   - Select the objects that belong to the new user object (capture with "Lasso").
   - Select the menu command **User object > Exit...**.
   - In the shortcut menu, select the command **Configuration dialog**.

3. Enter a name for the object , e.g. "MotorSpecial", in the "Object type" field of the configuration dialog box.
4. Select the entry "Custom<...>" in the "Selected properties" column and rename it (e.g. "General"). You can enter any name.
5. Select the entry "DataSet1" in the "Objects" column.
6. Double-click on the following entries in the "Properties" column:
   - String0
   - String1
   - String2

   The properties are added to the "Selected properties" list in the renamed structured.
7. Select the properties on the table in the "Selected properties" list. Open the "Properties..." shortcut menu and change the entry files as shown in the table:

Selected property	Attribute name	Property name
String0	type	type
String1	tagname	tagname
String2	servername	servername

8. Select the entry "I/O box2>" in the "Objects" column.
9. Double-click on the following entries in the "Properties" column:
   - Display
   - Output format

   The properties are added to the "Selected properties" list in the renamed structure.
10. Select the properties on the table in the "Selected properties" list. Open the "Properties..." shortcut menu and change the entry files as shown in the table:

Selected property	Attribute name	Property name
Display	Visible1	Tag visible
Output value	tagname	NameOfTag

11. Select the properties of the other single objects and repeat steps 9 to 10 for the properties you need for the user object (e.g. "group value", "relevant to group" or "output value").
12. Click "OK".
    The added attributes are visible on the user object in the selected properties.
    In the example: "General" property.

Note

Property name and attribute name

The "Property name" is shown on the user object in the configured language. The attribute is registered in WinCC with the attribute name. The attribute can be used with the attribute name in actions (C actions and VBS actions), for example.

10.5.2.4 How to parameterize the user object

Parameterize prepared user object

1. Select the created user object.
2. Select the "General" property from the tree structure.
3. Adapt the values for "Attribute" and "Static" as per the following table:

Value in the "Attribute" column	Adjusted value in the "Static" column	Example
type	Enter the AS block and the variant of the associated block icon. An entry must be structured as follows: <@<symbolic AS block>/<variant of the block icon> Note: The name of the AS block can be found in the component view in the block folder of the S7 program.	@MotL/MYONE
tagname	Note: This name is overwritten by the "Create/update faceplates" function.	Enter the following placeholder "tagname"
servername	Enter the name of the faceplate to be opened when you click on the block icon (user object) in process mode.	PCS 7 MotL Control
tag	Example: Enter the following placeholder "tagname".	Enter the following placeholder "tagname".

10.5.2.5 Save

Procedure

1. Specify the following object properties:
   - Select the root node from the tree structure.
     Change the "Object name" attribute in the details and enter a name for the block icon.
   - Enter all the other user-defined properties in accordance with the project requirements.
2. Save the picture as user object template under a descriptive name.
   Read the following section "Rules for using multiple template files (Page 159)".

Additional information

You can save a user object in a library.
You can find information about this in section "How to Store a User Object (Page 174)".

10.5.3 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 182)"
- "Import picture objects (Page 182)"
- "Updating the picture objects (Page 184)"
- "Changing the link to the tag (Page 185)"

10.5.4 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.

Note

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.

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

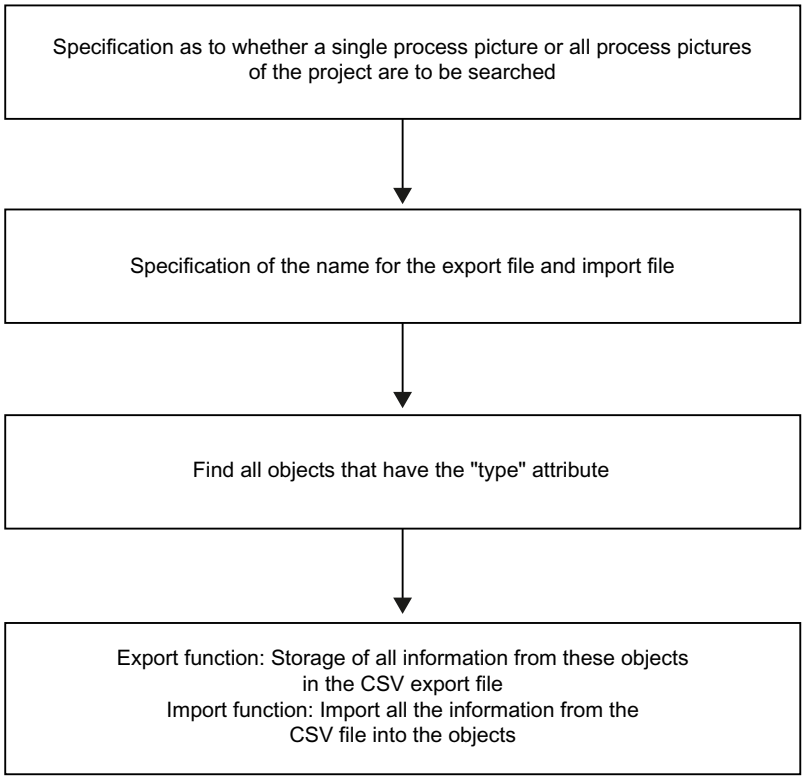
Additional information

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

10.5.5 Procedure for Importing and Exporting in the Graphic Object Update Wizard

Flow chart

In principle, the procedure for importing and exporting picture objects is identical:



Additional information

Additional information is available in the "Graphic Object Update Wizard" section of the *WinCC Information System* Online Help.

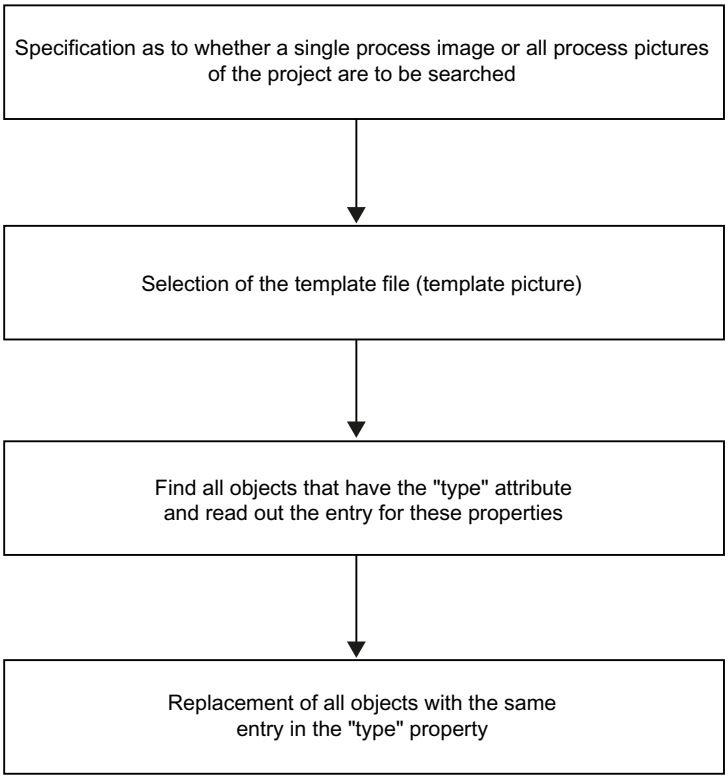
10.5.6 Wizard for Updating Picture Objects

Update the Picture Objects" wizard

If the export file requires no editing, you can use the "Graphic Object Update" wizard. Make a backup copy of the picture because the procedure cannot be reversed. Then open the respective picture in the Graphics Designer.

The "Graphic Object Update" wizard updates all instances of the user object following a change to the central template.

Flow chart



10.5.7 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.

10.5.8 How to Create a User Object Template

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.

Procedure

1. Open a new picture in the Graphics Designer.
2. Insert at least one user object into the picture.
   You can find information on this in the section "Creating and implementing user objects (Page 168)".
   Steps for creating user objects:
   a. Create user object
   b. Configure user object
   c. Assign parameters to the properties of the user object
3. Save the picture as a template file under a descriptive name.
   Read the following section "Rules for using multiple template files (Page 159)".

10.5.9 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 10-1 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.

If you …	… then use the wizard
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" dialog box ("Dynamic Wizard" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbars**
   - Select the "Dynamic Wizard" check box in the submenu.
     The "Dynamic Wizard" dialog box opens.
4. In the "Dynamic Wizard" dialog box, select the "Picture Functions" tab.
5. Double-click the required wizard. The table above contains a description of the wizards.
6. Click "Finish".
   The wizard is closed.

10.6 Using picture windows

10.6.1 Picture window

Introduction

Picture windows are a type of "container" inside a process picture. A picture window can accommodate a picture, 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.

Additional information

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

10.6.2 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 variables up to this 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 the Graphics Designer.
2. Create the picture with all information you want to display for the technological block.
   - Insert all the static objects.
   - Insert all the dynamic objects.
   - Enter the tag name for the tag connection in the form ".PV_IN," adding a period in front of the tag name. **Under no circumstances** should you connect a tag to an actual block instance.
3. Save this picture as a PDL file under a short meaningful name.

Note

You can also use an existing 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 "Standard" dialog box ("Standard" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbars**
   - In the submenu, select the "Standard" check box.
     The "Standard" dialog box opens.
3. In the "Standard" dialog box, select the object "Picture Window" in the tree view in the "Smart Objects" folder.
4. Use the mouse to navigate to the drawing area. Pressing the mouse button in, drag open a rectangle.
5. In the shortcut menu, select the menu command **Properties**.
   The "Object Properties" dialog box opens.
6. In the "Properties" tab, define the settings for the properties and attributes in accordance with the table above.
7. Click the title bar and select the command **Close** in the shortcut menu.

10.7 Working with cross-reference lists

10.7.1 General Information - 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.

10.7.2 Using cross-reference lists

Using cross-reference lists

In the PCS 7 environment, a cross-reference list is important mainly as a way to check for detection of 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	Create a cross-reference list (Page 192)
2	Go to a place of use (Page 193)
3	Perform corrections (Page 193)

10.7.3 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.

10.7.4 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.

10.7.5 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.

10.7.6 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".

10.8 Function of the Picture Tree Manager

10.8.1 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.

NOTICE
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.

10.8.2 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.

Message system settings

11

11.1 Overview of the message system

Introduction to the message system

If you use the "User-configurable message classes" function, read the information on this in the "Configuring the PCS 7 message system" section of the " *Process Control System PCS 7; Engineering System*" documentation.

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

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

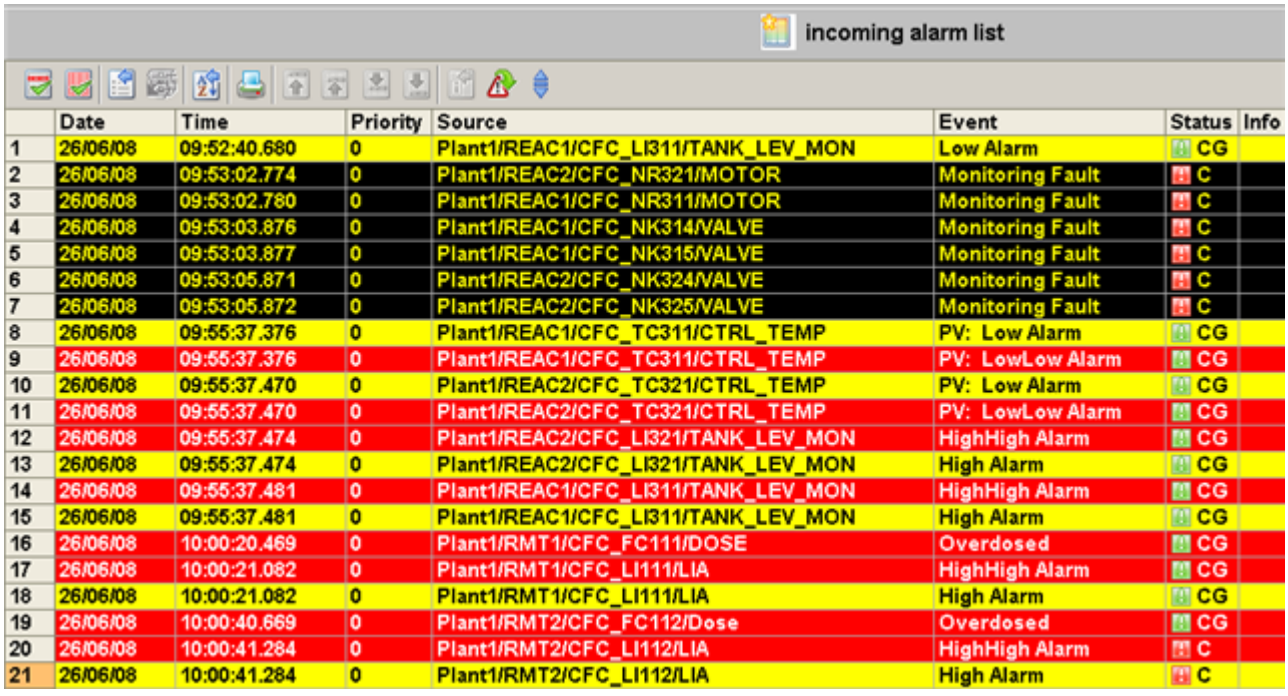
In process mode, process messages and process control messages are displayed to the operator in the form of message lists:

Using the "Loop-in-alarm" function, the operator can quickly change from the message lists to the process picture in which the relevant process tag is displayed. The associated block icon is labeled clearly in the process picture.

The message system thus ensures the following:

- Detailed information about fault and operating states
- Early detection of critical situations

- Prevention and reduction of downtimes
- Increased product quality



incoming alarm list

	Date	Time	Priority	Source	Event	Status	Info
1	26/06/08	09:52:40.680	0	Plant1/REAC1/CFC_LI311/TANK_LEV_MON	Low Alarm	CG	
2	26/06/08	09:53:02.774	0	Plant1/REAC2/CFC_NR321/MOTOR	Monitoring Fault	C	
3	26/06/08	09:53:02.780	0	Plant1/REAC1/CFC_NR311/MOTOR	Monitoring Fault	C	
4	26/06/08	09:53:03.876	0	Plant1/REAC1/CFC_NK314/VALVE	Monitoring Fault	C	
5	26/06/08	09:53:03.877	0	Plant1/REAC1/CFC_NK315/VALVE	Monitoring Fault	C	
6	26/06/08	09:53:05.871	0	Plant1/REAC2/CFC_NK324/VALVE	Monitoring Fault	C	
7	26/06/08	09:53:05.872	0	Plant1/REAC2/CFC_NK325/VALVE	Monitoring Fault	C	
8	26/06/08	09:55:37.376	0	Plant1/REAC1/CFC_TC311/CTRL_TEMP	PV: Low Alarm	CG	
9	26/06/08	09:55:37.376	0	Plant1/REAC1/CFC_TC311/CTRL_TEMP	PV: LowLow Alarm	CG	
10	26/06/08	09:55:37.470	0	Plant1/REAC2/CFC_TC321/CTRL_TEMP	PV: Low Alarm	CG	
11	26/06/08	09:55:37.470	0	Plant1/REAC2/CFC_TC321/CTRL_TEMP	PV: LowLow Alarm	CG	
12	26/06/08	09:55:37.474	0	Plant1/REAC2/CFC_LI321/TANK_LEV_MON	HighHigh Alarm	CG	
13	26/06/08	09:55:37.474	0	Plant1/REAC2/CFC_LI321/TANK_LEV_MON	High Alarm	CG	
14	26/06/08	09:55:37.481	0	Plant1/REAC1/CFC_LI311/TANK_LEV_MON	HighHigh Alarm	CG	
15	26/06/08	09:55:37.481	0	Plant1/REAC1/CFC_LI311/TANK_LEV_MON	High Alarm	CG	
16	26/06/08	10:00:20.469	0	Plant1/RMT1/CFC_FC111/DOSE	Overdosed	CG	
17	26/06/08	10:00:21.082	0	Plant1/RMT1/CFC_LI111/LIA	HighHigh Alarm	CG	
18	26/06/08	10:00:21.082	0	Plant1/RMT1/CFC_LI111/LIA	High Alarm	CG	
19	26/06/08	10:00:40.669	0	Plant1/RMT2/CFC_FC112/Dose	Overdosed	CG	
20	26/06/08	10:00:41.284	0	Plant1/RMT2/CFC_LI112/LIA	HighHigh Alarm	C	
21	26/06/08	10:00:41.284	0	Plant1/RMT2/CFC_LI112/LIA	High Alarm	C	

Message lists

The plant operator can call up the message system in process mode by clicking a button in the keypad area. The plant operator can call up the message lists from there:

Message list	Display
Incoming list	Display of all unacknowledged event messages
Acknowledged list	Display of all acknowledged event messages which are still pending in the process
Outgoing list	Display of all the messages which are marked as "Outgoing" and have not been acknowledged.
List of pending messages	Shows all acknowledged and unacknowledged messages which have not yet gone out
Operation list	Display of all the operator input messages
Process control list	Display of all the process alarm messages, e.g. failure of a rack
History list	Display of all event messages
List of hidden messages	Display of all event messages which are hidden manually by the operator or automatically
List of messages to be hidden	Displays all messages that are pending and automatically hidden
Lock list	Displays all messages that are locked

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.

Configuring the message system

You can find additional information about the settings for the message system in the WinCC Explorer in the following sections:

- Settings for the message system in the OS project editor (Page 199)
- Settings for the message system in the "Alarm Logging" editor (Page 201)
- Message List Settings in the Graphics Designer (Page 202)

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

11.2 Settings in the OS project editor

11.2.1 Settings for the message system in the OS project editor

Introduction

Basic settings for the message system are made automatically in the OS project editor of the SIMATIC Manager for displaying 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.
- Select the "Show button for manual hiding" check box to allow the plant operating to use the "Smart Alarm Hiding" function (manual hiding and showing of messages) in process control.
  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.

You can find additional information on this in the section "How to make message system settings in the OS project editor (Page 201)".

Changing basic settings in the "Message display" tab and in the "Message configuration" tab

You can change the basic settings for representing the message system in the process control.

You perform changes to the basic settings in the "Message Display" and "Message Configuration" tabs of the OS project editor.

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

- "Message filter"
- "Extended message line"
- "Authorization check of messages without a specified area"
- "Smart Alarm Hiding"
- "Sorting of message pages"
- "Group display hierarchy"
- "Operator input messages"

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

Activate the "Complete configuration" 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 input 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.

11.2.2 How to make message system settings in the OS project editor

Procedure

1. In the WinCC Explorer tree view, select the "Project Editor".
2. Open the shortcut menu and select the **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 218)" 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.

11.3 Settings in the Alarm Logging editor

11.3.1 Settings for the message system in the "Alarm Logging" editor

Data transferred from SIMATIC Manager

You have already entered any necessary special message texts in SIMATIC Manager in the block properties of a block instance in a CFC/SFC chart You have also made the AS-OS assignment in the plant view of SIMATIC Manager.

Additional information about configuring messages in SIMATIC Manager is available in the section "Message Configuration (Page 75)".

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 message 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 combine single messages into group messages.

Additional information

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

11.4 Settings for message lists

11.4.1 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.

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

Sorting criteria in message lists

Since you have already specified message priorities in the ES for the individual block types or block instances, you can use these message priorities as a sorting criterion for message lists.

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

Layout and selection of message blocks

Each message list is based on a PDL file created in the Graphics Designer. You can define properties for these pictures as required.

The following table shows the PDL file where the message lists are located.

Message List Type	File Name
One-line message in overview area	@AlarmOneLine.pdl
Highest priority messages	@AlarmEmergency.pdl
Acknowledgeable highest priority messages	@AlarmEmergencyOP.pdl
Incoming list	@AlarmNew.pdl
Acknowledgeable incoming list	@AlarmNewOp.pdl
Acknowledged list	@AlarmOld.pdl
Acknowledgeable acknowledged list	@AlarmOldOp.pdl
Outgoing list	@AlarmGone.pdl
Acknowledgeable outgoing list	@AlarmGoneOp.pdl
List of pending messages	@AlarmActive.PDL
Acknowledgeable list of pending messages	@AlarmActiveOp.PDL
Process control list	@AlarmProcess.pdl
Operation list	@AlarmOperation.pdl
History list	@AlarmJournal.pdl
List of hidden messages	@AlarmHidden.pdl
Acknowledgeable list of hidden messages	@AlarmHiddenOP.pdl
List of messages to be hidden	@AlarmHiding.pdl
Acknowledgeable list of messages to be hidden	@AlarmHidingOP.pdl
Lock list	@AlarmLocked.PDL

11.4.2 How to 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 with the highest priority is shown in the first place.
7. If desired, specify additional sort criteria.
8. Go to the other tabs to specify the layout or the message blocks to be displayed.
9. Select the **File > Save** command.
   The file is saved with the modified settings.

System reaction

Repeated, unacknowledged messages

If messages enter and exit several times without having been acknowledged, the older messages are removed from the incoming alarm list and acknowledged automatically. However, the history list (archive) displays all messages.

The latest message requiring acknowledgment with the highest priority is displayed in the one-line message line of the overview area.

11.5 Using and Configuring the Horn

11.5.1 Function of the Horn

Introduction

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

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

The "Horn" function

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

- You can connect a signal module to a PCI interface in the operator station.
  - You can use the signal module to control three visual or acoustic signal generators. You assign signal tags to these three signal generators in the WinCC "Horn" editor.
    You can find additional information about this in the section "How to Configure a Horn (Page 210)"
  - The signal generator 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 signal generators is activated.
  - Connection of a signal module also provides lifebeat monitoring with the watchdog function.
- You can use a standard sound card installed in the operator station.
  - The acoustic signal is produced by a WAV file, which continues to be played until the message is acknowledged. You can specify the maximum number of WAV files that can be played simultaneously.
  - Lifebeat monitoring cannot be implemented with a sound card.

It is possible to combine signal modules and sound cards.

You configure the horn in the "Horn" editor.

Additional information

- You can find additional information in the following sections:
- Additional information is available in the *WinCC Information System* online help.

11.5.2 Functioning of Signal Tags

Introduction

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

The "Horn" editor allows you to configure which signals should be triggered when certain messages arrive.

Behavior in process mode

The principle in process mode is as follows:

An incoming message that corresponds to the configured message properties and configured 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.

Additional information

- For additional information, refer to the section "Settings in the 'Horn' Editor (Page 207)".
- Additional information is available in the *WinCC Information System* online help.

11.5.3 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. The associated message is not acknowledged.

The horn is acknowledged without verification of the authorization.

When the respective message that triggered an acoustic signal is acknowledged, the associated signal tag is set to "0" and the horn signal is acknowledged at the same time.

You have the following options for acknowledging the horn signal:

- Local horn acknowledgment
- Multiple horn acknowledgment via a group

Local horn acknowledgment

The horn is acknowledged on a separate, independently operating PC station via the "@HornReset" tag. If an operator acknowledges the horn, the acknowledgement tags and hence all signal tags are reset. The signal generators are disabled.

Multiple horn acknowledgment via a group

If you want to acknowledge the same horn from different operator stations, these operator stations must belong to the same acknowledgement group. In the "Horn" editor, you assign the group to the horn (e.g. Meld1).

All operator stations belonging to an acknowledgement group must be connected to the same Ethernet bus.

Additional information

- For additional information, refer to the section "Detail areas for the "Signal assignment" hierarchy folder (Page 209)".
- Additional information is available in the *WinCC Information System* online help.

11.5.4 Settings in the 'Horn' Editor

Settings in the 'Horn' Editor

In the "Horn" editor, you can configure horns within various hierarchy folders.

The following table shows the hierarchy folders with their detail areas.

Hierarchy folder	Detail area
Message assignment	Message assignment • Select a message class. • Select a message tag. • Assign filter criteria to the message tag.
	Properties - Settings Specify the message status for which the signal tag is to be set and the horn triggered.
Signal assignment	Signal assignment • Select a signal tag. • Assign the signal tag to a physical output of a signal module and/or a WAV file.
	Properties - Settings Define the reaction when acknowledging and playing sounds.

Additional information

You can find additional information on this subject in the sections:

- "Detail areas for the "Message assignment" hierarchy folder (Page 207)"
- "Detail areas for the "Signal assignment" hierarchy folder (Page 209)"

11.5.5 Detail areas for the "Message assignment" hierarchy folder

Introduction

In the "Message Assignment" detail area, select the signal tags to be connected to the properties of messages which serve as filters.

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

For an incoming message that meets the filter criteria, the assigned signal tag is set to "1". The same signal tag can be controlled by different message properties.

You also define the access rights for the individual message tags for which the message tags are triggered.

You specify the general message settings in the detail area "Properties - Settings".

"Message assignment" detail area

The following table provides an overview of the message properties.

The following settings influence when the signal tags are activated for the horn.

Filter criteria	Action
Message class	Select the message class from the drop-down list.
Priority	Specify the desired message priority that should activate the tag. Enter a number between 0 and 16. You can find additional information on this in the section "Message Priorities (Page 80)".
Origin	Select the origin from the drop-down list. You can use wildcard characters in the filter text. All text is included when the line is empty.
Area	Select an area from the drop-down list.
Event	Specify the filter properties. You can use wild card characters. All text is included when the line is empty.
Authorization	You can select a variety of permissions to activate the signal tags: • Default Authorization check for "Authorization for area" • Any other authorization that is entered in the "User Administrator" editor in WinCC. Authorization check for specified authorization and for "Authorization for area"

"Message assignment" detail area - an example

The following table shows an example of a minimal configuration for a message assignment.

Message class	Priority	Origin	Area	Event	Authorization	Message tag
Alarm					<Default>	alarm_horn
Tolerance					<Default>	tolerance_horn
AS process control message					<Default>	system_horn

"Properties - Settings" detail area

The following table shows the possible message settings.

Message settings	Description
Default authorization check for "Authorization for area"	You can disable the preset authorization check for "Authorization for area". If you disable the default authorization check, only the configured authorization is considered in addition to the filter criteria for triggering the signals during process control. There is no longer an "Authorization for area" check beside the configured authorization level. The authorization levels are specified in the "User Administrator" editor in WinCC.
Set tag	In the "Set tag" group: Specify the message status for which the signal tag is set and the horn is triggered.

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

Additional information is available in the *WinCC Information System* online help.

11.5.6 Detail areas for the "Signal assignment" hierarchy folder

Introduction

You configure the "Signal assignment" detail area and the "Properties - Settings" in the WinCC project of the PC station (OS client, OS server) where the signal module and/or WAV file is triggered.

"Signal assignment" detail area

You must assign an output of the signal module and/or a WAV file to each signal tag. The signal is triggered as soon as the assigned signal tag is set to "1".

You can trigger a signal module and a WAV file simultaneously. Furthermore, you can assign different signal tags to an output of the signal module.

You can set a specific order for the signal tags:
A message can only set a single signal tag. If the message fulfills the conditions of several

signal tags, the WAV file is only triggered for the signal tag in the top row of the table. You can change the order of the signal tags using the arrow buttons. This order has no effect on the behavior of the signal modules.

"Signal assignment" - an example

The following table shows an example configuration.

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

"Properties - Settings" detail area

The following table shows the possible signal settings.

Signal settings	Description
Acknowledge tag	This is where you specify the acknowledgment behavior for all signal tags. You can find additional information on this in the section "Acknowledging Signals (Page 206)".
Multiple acknowledgment via the following acknowledgment tags:	
Multiple acknowledgment in the following group:	The preferred configuration is multiple acknowledgment via a group. Multiple acknowledgment via acknowledgment tags has been retained for compatibility reasons.
Play sounds	This is where you specify how many sounds can be played simultaneously.
Number of simultaneously played sounds	

Additional information

Additional information is available in the *WinCC Information System* online help.

11.5.7 How to Configure a Horn

Procedure - Opening the "Horn" editor

1. In the WinCC Explorer tree view, select the "Horn" editor.
2. Open the shortcut menu (right-click) and select the menu command **Open**.
   The "Horn Configuration" dialog box opens.

Procedure - "Message assignment" hierarchy folder

1. Select the "Message assignment" hierarchy folder in the tree view.
2. Switch to the "Message assignment" detail area.
3. Specify the message tags and filter criteria in the table.
   - "Message class" cell
     Select the message class from the drop-down list.
   - "Priority" cell
     Enter the priority in the input box.
   - "Origin" cell
     Select an origin.
   - "Area" cell
     Select the area from the drop-down list.
   - "Event" cell
     Enter the event in the input box.
   - "Authorization" cell
     Select the authorization from the drop-down list.
   - "Message tag" cell
     Select the message tag.
4. Select the "Message assignment" hierarchy folder in the tree view.
5. Switch to the "Properties - Settings" detail area.
6. In the "Message settings" hierarchy folder, select the message status that will set the signal tag.
   - In the "Set tag" line, select "Not for incoming messages without acknowledgment" from the drop-down list to suppress chatter messages.
   - In the "Set tag" line, select "For every incoming message" from the drop-down list if you do not want to suppress chatter messages.
   - If you want to perform an authorization check for "Authorization for area", clear the check box "Default authorization check "Authorization for area"".
   - If you do not want to perform an authorization check for "Authorization for area", select the check box "Default authorization check "Authorization for area"".

Procedure - "Signal assignment" hierarchy folder

1. Select the "Signal assignment" hierarchy folder in the tree view.
2. Switch to the "Signal assignment" detail area.

3. Specify the assignment of the signal tag to the signal modules and/or sound files in the table:
   - "Signal tag" cell:
     Select the signal tag that should trigger an acoustic or optical signal on the assigned signal generator.
   - "Signal module" cell:
     Select the desired output of the signal module from the drop-down list.
   - "Sound" cell:
     Requirement: The sound card is installed.
     Select the required WAV file.
4. Select the "Signal assignment" hierarchy folder in the tree view.
5. Switch to the "Properties - Settings" detail area.
6. Set the type of acknowledgment for all signals in the "Signal settings" hierarchy folder.
   - If you wish to perform local acknowledgment, select the "Local only" check box in the "Acknowledgment tags" line.
   - If you want to acknowledge several horns simultaneously with a tag, select "Multiple acknowledgment by tags" from the drop-down list in the "Acknowledgment tags" line. In the "Multiple acknowledgment by the following acknowledgment tags:" area, select the desired acknowledgment tags.
   - If you want to acknowledge several horns in a group simultaneously, select "Multiple acknowledgment in group" from the drop-down list in the "Acknowledgment tag" line. In each WinCC project of the the corresponding PC station, enter the same group name in the "Multiple acknowledgment in the following group:" area.
7. Set the sound for the horn in the "Signal settings" hierarchy folder.
   - If several messages are pending at the same time and all sounds are to be played simultaneously, select "Play all sounds simultaneously" in drop-down list in the "Play sound" line.
   - If several messages are pending at the same time and all sounds should not be played simultaneously, select "Limit number of simultaneously playing sounds" in drop-down list in the "Play sound" line.
     Enter the number in the "Number of simultaneously playing sounds:" line.
     The order of the entries in the Sound column determines which sound is played.

Additional information

- You can find more detailed information in the sections
  "Detail areas for the "Message assignment" hierarchy folder (Page 207)"
  "Detail areas for the "Signal assignment" hierarchy folder (Page 209)"
- Additional information is available in the *WinCC Information System* online help.

11.5.8 Example Configurations

Overview of example configurations

The following examples shows you how horns can be used:

- OS client with signal generator (Page 213)
- OS client with multiple acknowledgment in a group (Page 214)
- OS server with signal generator (Page 215)

11.5.9 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 signal generator.
- OS server has no signal generator.

Prompt

When an OS client receives a message, a signal is triggered or acknowledged independent of the other OS clients. This has no effect on the other OS clients.

Procedure

1. Configure the message and signal assignment in the WinCC "Horn" editor.
2. Select "Local only" from the drop-down list of the "Acknowledgement tag" line in the "Signal assignment" hierarchy folder of the "Properties - Settings" detail area.

Behavior in the process control

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

11.5.10 OS Clients with Multiple Acknowledgment in a Group

Introduction

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

Requirements

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

Prompt

The signal generators of all OS clients in a group are acknowledged by an acknowledgment from one OS client.

Procedure

1. Configure the message and signal assignment for both OS clients in the WinCC "Horn" editor.
2. In the detail area "Properties - Settings" in the "Signal assignment" hierarchy folder, select "Multiple acknowledgment in group" from the drop-down list in the "Acknowledgment tag" line in the "Signal settings" hierarchy folder.
3. Enter the same group name each time, for example, "GROUP1", in the input box in the "Multiple acknowledgment in group" line.

Behavior in the process control

The signal generators of the individual OS clients are triggered by a message independent of one another. When the signal generator is acknowledged on one OS client, the signal generator of the other OS client is acknowledged at the same time. The signal tag is reset and the signal deactivated on each OS client.

Note

When configuring a shared acknowledgment, be aware that users with different authorization levels can be logged on to the OS clients. When a message arrives which triggers the signal generator, for example, the user on OS client 1 can see this message as a result of his authorization level. The user on OS client 2 does not have the appropriate level of authorization to view the message, although he can acknowledge the signal generator on OS client 2.

11.5.11 OS Server with Transducer

Introduction

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

Requirements

- The OS server has a signal generator.
- OS clients have no signal generator.

Prompt

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

Procedure

1. Configure the signal assignment on each OS client in the WinCC "Horn" editor.
2. Enter the signal tag with a server prefix in the "Signal tag" column of the table in the "Signal assignment" hierarchy folder of the "Signal assignment" detail area, because the signal tag must be created on the OS server.
3. Select "Multiple acknowledgment in the following group" from the drop-down list of the "Acknowledgement tag" line in the "Signal settings" hierarchy folder of the "Properties - Settings" detail area.
4. In the "Multiple acknowledgment in the following group:" line, enter the same group name each time in the input box, for example, "GROUP1".
5. Configure the signal assignment on the OS server in the WinCC "Horn" editor.
6. Select "Multiple acknowledgment in the following group" from the drop-down list of the "Acknowledgement tag" line in the "Signal settings" hierarchy folder of the "Properties - Settings" detail area.
7. In the "Multiple acknowledgment in the following group:" line, enter the same group name each time in the input box, for example, "GROUP1".

Behavior in the process control

The signal generator of the OS server is triggered by the message on the OS client. Each OS client and OS server can acknowledge the signal generator. The signal tag on the OS server is reset and the signal deactivated

Note

When configuring a shared acknowledgment, be aware that users with different authorization levels can be logged on to the OS clients. When a message arrives which triggers the signal generator, for example, the user on OS client 1 can see this message as a result of his authorization level. The user on OS client 2 does not have the appropriate level of authorization to view the message, although he can acknowledge the signal generator on OS client 2.

11.6 Locking/unlocking or displaying/hiding messages

11.6.1 Disabling and Enabling Messages

Locking and unlocking messages for blocks and OS areas

The "Lock/unlock messages" function for individual message-capable blocks and all message-capable blocks in an OS area is used when the plant operator wants to lock or unlock all messages of a message-capable block or all messages of all message-capable blocks in an OS area.

Messages generated at locked blocks in the automation system are neither displayed nor archived in group displays in the process control.

The disable operation performed by the operator is recorded in the operator activities log.

The status of the disabled messages is visualized in the group display and in the overview area using the group display hierarchy.

Example applications:

- You want to put a process tag into operation.
- A hardware error causes messages you wish to suppress in process mode.

No 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.

11.6.2 Hiding and showing messages

Hiding and showing messages

You hide individual messages to reduce the number of messages displayed in process mode.

Options for hiding messages

The following options are provided for hiding messages:

- Manual hiding and showing of messages in process mode
  Further information is available in the section "Hiding and showing messages in process mode manually (Page 218)".
- 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.

11.6.3 Manual Hiding and Showing of Messages in Process Mode

Requirements

- The "Show button for manual hiding" check box for the "Smart Alarm Hiding" function is activated in the "Message display" tab of the "OS Project Editor" in the WinCC project of each OS.
- The period of manual hiding is set in the "Message display" tab of the OS Project Editor in the WinCC project of the OS server. The basic time setting is 30 minutes.
  Tip: You can modify this setting in process mode if the OS and ES are operated on a single PC station.

Note

The requirement for using the "Smart alarm hiding" function in process mode must be fulfilled for each operator station that uses this function. The "Smart Alarm Hiding" function corresponds with the "Manual hiding of messages" function.

Manual hiding of messages" button

When the requirements are met, the "Manual Hiding of Messages" button is available to the plant operator in the toolbar in process mode in the following message lists:

- Incoming alarm list
- Acknowledged alarm list
- Outgoing alarm list
- 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".

Additional information

- Section "How to make message system settings in the OS project editor (Page 201)"
- *Process Control System PCS 7; OS Process Control* manual
- Manual *Process Control System PCS 7; Engineering System*

Configuring the archiving functions 12

12.1 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.

A variety of functions are available for archiving process values (e.g. measured values, messages) with PCS 7:

- Archiving on the operator station
  The operator station saves measured values and messages in archives for long-term availability of the data.
- Archiving on a Process Historian (external archive server)
  The Process Historian can be used on a separate PC station to archive these process values.

Identifying process values for archiving

PCS 7 provides the option of automatically creating archive tags for process values marked accordingly. To do this, you must label these process values as relevant for archiving in SIMATIC Manager using the "Archive" attribute. You can only set this attribute for block I/Os intended for operator control and monitoring. If you have selected the appropriate option, PCS 7 automatically creates the required archive tags when the OS is compiled.

You can find additional information about this in the section "Defining Archive Tags (Page 73)".

Configuration of the OS for archiving

When using the Process Historian, the following property must be configured on each operator station from which values are to be archived:

The "Transfer to external archive server" check box is selected in the "Properties - OS – <name of the OS>" dialog box of the SIMATIC Manager.

- For OS servers: in the "Target OS" tab
- For redundant OS servers: in the "Target OS and Standby OS" tab

Sequence of archiving

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

If you also use a Process Historian, additional archiving routines are performed centrally on this Process Historian.

The local archives of OS servers are configured as short-term archives: When the archive has reached capacity limits, the oldest values are deleted to release space for saving new values. This corresponds with "FIFO" (First-in first-out) principle.

If the Process Historian is not available for a certain period of time, the OS server will attempt to export at a later point in time. As long as the data is still in the short-term archive, this remains possible without loss of data.

Evaluation of the archived data

The Information Server (IS) is the central reporting system that provides the stored archive data of the Process Historian independent of the PCS 7 Runtime systems.

12.2 Editors for Archive Configuration

Introduction

In PCS 7 there are two different types of archives that you configure in different editors:

- Archives for process values with the " Tag Logging" editor
- Message archive for messages and alarms with the "Alarm Logging" editor

Archive for process values

Archive tags are stored in the "SystemArchive". PCS 7 creates this archive automatically the first time you compile the OS with the "Archive tags" option. The system archive is configured in the "Tag Logging" editor.

A distinction is made between the archive types Tag Logging Slow and Tag Logging Fast:

- The Tag Logging Fast archive type is used by default for acquisition cycles of less than or equal to one minute.
  The default value of one minute can be changed manually in the "Tag Logging" editor via the archive configuration of the "Tag Logging Fast" archive type.
- The Tag Logging Slow archive type is used when the acquisition cycle is longer than one minute.

In the "Tag Logging" editor you can also use the **Link archive** command in the shortcut menu to access archives that are located elsewhere.

You can also create additional archives for process values in the "Tag Logging" editor.

Archive for messages and alarms

Alarms and messages are stored in the "Message archive". You configure this archive in the "Alarm Logging" editor.

Note

You only have to change the configuration in the "Tag Logging" and "Alarm Logging" editors if you want to adapt the default settings for archives made automatically by PCS 7 to the specific requirements of your project.

In the "Alarm Logging" editor you can also use the **Link archive** command in the shortcut menu to access archives that are located elsewhere.

Additional information

- is available in the section: "Additional Archives in the "Tag Logging" (Page 230) editor
- Online help *WinCC Information System*

12.3 Configuring archives on an OS server

Configuring archives on an OS server

To understand the archives, the following terms are important:

- Segment: The individual 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 information about calculation in the section: "Calculation of storage space and the number of single segments (Page 229)".

Parameter	Meaning
Max. size	• Recommended size of a single segment: maximum 2 GB • When the specified size for a single segment is reached, a new single segment is opened. • When the specified size of all single segments forming the entire archive is reached, the oldest single segment is deleted.
Time period	• When the specified time period for a single segment is reached, a new single segment is opened. • When the specified time period for all single segments forming the entire archive is reached, the oldest single segment is deleted.
Number of single segments	• Recommendation: maximum of 200

Note

Since you must make the archive type settings for each OS server, remember the following:

Configure approximately the same time periods for the single segments.

You must also define the timing for the segment change. When this value is reached, a single segment is closed regardless of whether the specified size or specified time period has been reached.

Note

Note the following for non-redundant OS servers:

If you want a new single segment to be opened when process mode starts, set the timing of the segment change before the start of process mode.

To store the archive data, you also specify the backup parameters. A backup is started shortly after a segment change.

Configuring the archiving routines for a Process Historian

If you use a Process Historian for archiving, you need to make additional parameter settings for the archiving routines on the Process Historian.

Note

Relationships and rules must be taken into account for the configuration of the archives on an OS server and the configuration of the archiving routines on the Process Historian.

You can find a detailed description of the rules in the section "Rules for Archive Configuration (Page 237)".

Additional information

- Online help *WinCC Information System*

12.4 Backup configuration

Introduction

To ensure complete documentation of archive data with no gaps, you create backups for your archive data.

You configure the backups on the "Backup configuration" tab of the "Tag Logging" editor in WinCC Explorer.

On the "Backup configuration" tag you enter the path to the backup medium.
The path details can be local to the computer or specified as a network path.

Settings for the backup configuration

You can set two export paths:

- Destination path
- Alternative destination path

The entry in the "Destination path" input box defines the path to the backup medium on which the archive data are stored.

The entry in the "Alternative destination path" input box defines the alternative destination path to the backup medium.

The alternative destination path is used if, for example, the storage capacity of a backup medium is fully occupied.

If you activate the "Backup on both paths" check box, the backup data will be saved on both backup media.

Note

In a plant configuration with a Process Historian, you do not define any path settings for the destination path and alternative destination path. The paths are automatically set after the destination OS has been set.

Additional information

For additional information, refer to the online help for the *WinCC Information System*.

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

Requirement

The "Tag Logging" editor is open.

Procedure

Note

Configure the two types of archives one after the other.

1. Select the "Archives" hierarchy folder.
2. In the shortcut menu, select the command **Archive Configuration > "Archive type" > Properties**.
   The "TagLogging Fast" or "TagLogging Slow" dialog box opens.
3. Set the archive parameters.
4. Select the "Backup Configuration" tab.

5. If you are using a Process Historian, you need not make any entries in the "Backup Configuration" tab.
   Check that the following condition is met and proceed to step 7.
   Requirement:
   The "Transfer to external archive server" check box is selected in the "Properties - OS – <name of the OS>" dialog box of the SIMATIC Manager.
   - For OS servers and ES/OS single station systems: in the "Target OS" tab
   - For redundant OS servers and ES/OS single station systems: in the "Target OS and Standby OS" tab
   - Also assign the external archive server in an ES/OS single-user system.
     Click the "Assign archive server" button.
     Assign the Process Historian.
6. If you do not use a Process Historian and you wish to back up your archive data, perform the following configurations:
   - Select the "Activate Backup" check box.
   - Enter the destination path of the location where you want to store the backup data.
     Click "Browse" next to the "Destination Path" box and select the directory in which the archive backup is to be saved.
   - If required, select an alternative destination path.
     If the archives cannot be backed up in the default destination path, they are automatically backed up to the alternative destination path.
   - If you want to perform a double backup, select the "Backup on both paths" check box.
7. Click "OK".
   The settings for your archive are complete.

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

Requirement

The "Alarm Logging" editor is open.

Procedure

1. Select the "Messages" hierarchy folder.
2. In the shortcut menu, select the menu command **Archive configuration > Properties**.
   The "Alarm Logging" dialog box opens.
3. Perform steps 3 to 7 as described in the section "How to configure the archives in the "Tag Logging" editor (Page 225)".

12.7 Determining the Archive Storage Capacity Requirements

Introduction

If you want to assess how long you can continue to access the archives on an OS server or the archive values on a Process Historian without having to resort to archives in other locations, you need to determine the storage capacity requirements.

You can increase the storage capacity by adding additional hard disks.

The storage capacity requirements are determined by the total storage space required to archive the areas concerned:

- Space required for the TagLogging Fast archive type
- Space required for the TagLogging Slow archive type
- Space required for the "Message Archive" archive type
- Space required for the "OS and Batch reports" archive types

The guide values given below may differ from those actually encountered within the context of operation.

Space required by individual measured values and messages for archive types

The space required for an archive depends on the archiving settings, the data type and the time behavior of the values to be archived.

- TagLogging Fast archive type
  The TagLogging Fast values are stored in compressed form in the database. You require approx. 10 to 15 bytes per measured value. In some cases greater compression is possible.
- TagLogging Slow archive type
  The space required for a measured value in the TagLogging Slow archive is 32 bytes.
- Message Archive:
  A message with the maximum number of associated values and comments requires 4 KB of space. The minimum value for a message is 172 bytes.

Calculation

You can use the following formula for calculating the maximum memory requirement per second:

- Memory requirement [bytes/s] = x * 15 bytes/value + y * 32 bytes/value + z * 4096 bytes/value

Key to the formula:

- x: average number of values of the TagLogging Fast archives per second
- y: average number of values of the TagLogging Slow archives per second
- z: average number of messages per second

Memory space required for several days:

You can use the following formula to calculate the memory space required for several days:

Memory space required [bytes/s] * 86,400 seconds * n days

Example

No.	Assumption	Description
1	x = 10,000 values/s	Number of values for the TagLogging Fast archives per second
2	y = 10 values/s	Number of values for the TagLogging Slow archives per second
3	z = 2 values/s	2 messages per second
4	n = 5	Number of days, where 1 day = 24 * 3,600s = 86,400s

Calculation

Memory space required in bytes for 5 days

= (10,000 values/s * 15 bytes/value + 10 values/s * 32 bytes/value + 2 values/s * 4,096 bytes/value) * 5 * 86,400 s

= (150,000 bytes/s + 320 bytes/s + 8,192 bytes/s) * 5 * 86,400 s

= (158,512 bytes/s) * 5 * 86,400 s

= 68,477,184,000 Byte

= approx. 64 GB

Space required for OS reports

In the case of a standard protocol with a page layout of "@CCAlgRtOnlineMessageGone.rpl", 120KB of space is required for a page with 32 messages.

There is additional information available in the *WinCC Information System* online help.

Space required for batch reports

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

After installing SIMATIC BATCH, you can also open the readme file in the Windows Start menu from the submenus **SIMATIC** and **Product Information**.

12.8 Calculation of storage space and the number of single segments

Number of single segments

Recommendations for an OS server:

- Do not create more than 200 single segments per OS server
- Create one single segment per archive type per day for the following archive types:
  - TagLogging Fast
  - TagLogging Slow
  - AlarmLogging

Before you calculate the number of single segments, calculate the maximum storage space per archive type per day.

Calculating the number of single segments for the TagLogging Fast archive

- You can use the following formula for calculating the maximum storage space per day:
  - 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

12.9 Configuring additional archives in Tag Logging

12.9.1 Additional Archives in the "Tag Logging" editor

Introduction

If you require further special archives in addition to the archives created by default, you can create these in the "Tag Logging" editor.

The following archive types are available in the "Tag Logging" editor:

Archive	Description
Process value archive	In the process value archive, all values are written directly from the process.
Compressed archive	The values from an existing archive are taken according to a principle defined by you and are written to this compressed archive.

Sequence of archiving

The default acquisition type is "cyclic-continuous". This means that archiving is carried out in defined cycles.

If you use a Process Historian, the data is stored automatically from this archive in the long-term archive.

Configuring archives

First, you manually assign all the tags to be stored in the archive. Then, you assign properties to these tags, such as the tag name and archiving cycle. You defined these properties in the process object view of SIMATIC Manager. The process object view displays all tags and their associated properties in a table where you can edit the properties.

Additional information

- Online help *WinCC Information System*
- Manual *Process Control System PCS 7; Engineering System*

12.9.2 Overview of Configuration Steps for a TagLogging archive

Introduction

Only perform these steps if you want to create additional archives.

You configure an archive in the "Tag Logging" editor.

Overview of configuration tasks

Creating additional archives involves the following:

Step	What?
1	Specifying a new archive (Page 231)
2	Specifying the tag properties (Page 231)

12.9.3 How to Define a New Archive

Requirement

The Tag Logging editor is open.

Procedure

1. In the tree view, select the hierarchy folder of the required archive type in the "Archives" hierarchy folder.
2. Switch to the "Archives ["Archive type"]" detail area.
3. In the "Archive name" cell, enter a name.
4. Select the cell with the name of the archive.
5. Set the properties for the archive.
6. Select the hierarchy folder of the archive you have created in the tree view.
7. Select the desired tag in the "Tag" cell.
   If you want to select several tags, press the <Ctrl> key and make your selection.
8. Set the properties for the tag.
9. Create additional archives as necessary.
   To do so, repeat steps 2 through 9.

Additional information

Additional information is available in the *WinCC Information System* online help.

12.9.4 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*

12.10 Configuring and using a Process Historian (external archive server)

12.10.1 Overview of archiving with the Process Historian

Introduction

The Process Historian is used as an external archive server for centralized long-term archiving of process values, such as measured values, messages and logs.

Note

- The following section provides general information and configuration descriptions for the Process Historian.
- You can find detailed information on configuring the Process Historian in the documentation for the Process Historian.

Configuration

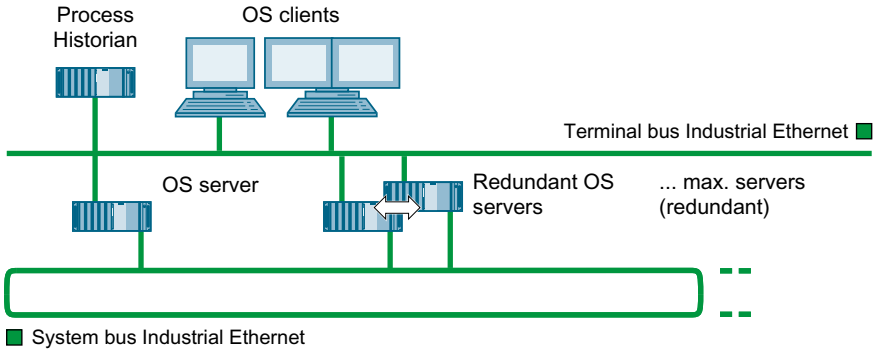
There can be **only one** Process Historian within a multiproject.

This is a node on the terminal bus and is not connected to the system bus.

When a Process Historian is used, data communication is required between the Process Historian and the OS servers from which data is to be archived.

The Process Historian can be configured redundantly to increase availability.
You can find additional information on this in the manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*.

The following figure shows a sample plant configuration with a Process Historian:



Using a Process Historian

You can archive the following using a Process Historian:

- Messages (Alarm Logging)
- Archive values (Tag Logging)
- SIMATIC BATCH batch logs

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

Data stored on external media can be read back **to the same** Process Historian to which it was exported.

Display of the archived data

- OS clients can display the following information from the Process Historian:
  - 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 find additional information on this topic in the section "Displaying archive data on the OS client (Page 240)".
- Reports und batch logs
  On the Information Server, you create reports and batch logs that are based on the archived data of the Process Historian. The Information Server is installed on a separate PC station.
  You can find additional information on this topic in the section "Displaying archive data of the Process Historian with the Information Server (Page 240)".

Reaction to failure of the Process Historian

- Failure of a non-redundant Process Historian:
  If the Process Historian fails, single segments continue to be archived on the OS servers. The archive on the OS servers is a short-term archive. After activation of the Process Historian, data in the short-term archive that has not been exported is copied to the Process Historian.

  Note

  If the Process Historian fails for a period longer than the period of the short-term archive, the data on the OS servers is overwritten. The data can no longer be copied to the Process Historian.

- Failure of a redundant Process Historian:
  - Failure of a partner station
    If a partner station fails, data are only archived on the partner station that has not failed. Once the failed partner station has resumed operation, data synchronization takes place between the partner stations.
  - Failure of both partner stations
    See "Failure of a non-redundant Process Historian:".

Installation and licensing

During the system setup of PCS 7, you can find the add-ons for package installation of the Process Historian and reporting functions:

- Process Historian
- Information Server

These servers require additional licenses.

You can find information on this in the installation manual *Process Control System PCS 7; Licenses and Configuration Limits*.

Using Process Historian

When you use the Process Historian, the "Process Historian Ready Component" software component must be installed and configured on the operator stations on which the process values are to be archived on the Process Historian.

Additional information

Manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*

12.10.2 Archiving of messages and archive values

Requirements

- The OS servers and the Process Historian are available in the same project or multiproject.

  Note

  There can be **only one** Process Historian within a project or multiproject.

- In SIMATIC Manager (process object view), the measured values are marked for "long-term archiving" on the "Archive tags" tab.

Nature of the archiving process for messages and archive values

The archiving process for messages and archive values is as follows:

- The process data for the long-term archive will be written directly by the OS on the Process Historian.
- The process data is stored in the archives on the OS servers which are configured in the "Tag Logging" and "Alarm Logging" WinCC editors. The properties of these archives are not relevant for archiving on the Process Historian.

Additional information

Documentation *Process Historian*

12.10.3 Archiving of batch 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 240)".

12.10.4 Archiving on a redundant SIMATIC Process Historian

Archiving process on a redundant Process Historian

The data is archived parallel to the operator control and monitoring systems when a redundant Process Historian is available in the plant configuration:

12.10.5 Rules for Archive Configuration

Archive capacity requirements

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

For additional information about determining the amount of storage space required, see the section "Determining the Archive Storage Capacity Requirements (Page 227)".

Rules for Archive Configuration

The following rules must be taken into account for the configuration of the archives on an OS server and the configuration of the archiving routines on the Process Historian.

OS server rules:

- Set the time period and size for the single segments on the OS servers substantially shorter/ smaller than the time period for the single segment on the Process Historian.
  - Set the time period for single segments in "Tag Logging":
    WinCC Explorer > Tag Logging > Archive configuration > Archive type TagLogging Fast and archive type TagLogging Slow > Properties > "Archive configuration" tab > "Time period and size of a single segment" parameter
  - Set the time period for single segments in the "Alarm Logging" editor:
    WinCC Explorer > Alarm Logging > Archive configuration > Message archive Archive type > Properties > "Archive configuration" tab > "Time period and size of a single segment" parameter
- The time period and size of all segments can be configured.
  However, the size of all segments is limited by hard disk capacity. The more hard disk capacity is available, the more data can be stored.

Additional information

You can find additional information about calculating the size of a single segment and calculating the maximum number of single segments in the section "Calculation of storage space and the number of single segments (Page 229)".

12.10.6 Configuring a Process Historian in overview

Overview of the Steps in Configuration

The table below provides an overview of the required configuration for a Process Historian.

The table also shows in which program part you run these configuration tasks. The tasks are listed in the table in the order in which they should be performed.

Note

The following table contains general configuration descriptions for the Process Historian.

You can find detailed information on configuring the Process Historian in the documentation for the Process Historian.

The operator stations send tag values to the Process Historian, if the tag is configured with the "Long-term archiving" property.

You can find additional information on this in the section "Archive tags (Page 73)".

What?	Where?
Set up the PC stations (network adapters) for the ES	SIMATIC Shell, "Set PC Station" configuration console
PC station for SIMATIC Process Historian • Inserting into a project • Specifying the name of the PC station	SIMATIC Manager
Configuring the hardware of the Process Historian: • Adding the "Process Historian" application and hardware components associated with this PC station.	HW Config
Enable the "Transfer to external archive server" option on the OS servers from which data is to be exported to the Process Historian [1)]	SIMATIC Manager
After the "Process Historian" PC station starts, the Process Historian is ready for operation.	Process Historian **Note:** The Process Historian must be started manually after a manual stop.

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

Additional information

- 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; PCS 7 - PC Configuration*
- Documentation *Process Historian*

12.10.7 Configuration of a redundant Process Historian

You can install a redundant Process Historian to enhance availability.

You can find additional information relating to the configuration of a redundant Process Historian in the manual *Process Control System PCS 7; Fault-Tolerant Process Control Systems*.

12.10.8 How to create and configure a Process Historian

Requirement

The OS servers have been compiled.

Procedure

1. In the component view of the SIMATIC Manager, select the project into which you want to insert the Process Historian.
2. Select the menu command **Insert > Station > SIMATIC PC station**.
   A new SIMATIC PC station is inserted in the selected project.
3. Select the SIMATIC PC station.
4. Select the menu command **Edit > Object Properties**.
5. Go to the "Name:" input field to enter a name.
   Enter the Windows name of the station in the "Computer name" input box.
   Click "OK".
6. Select the SIMATIC PC station in the component view and open HW Config by double-clicking on the "Configuration" object in the detailed view.
   The hardware configuration of the SIMATIC PC station opens.
7. If the hardware catalog is not visible, select the menu command **View > Catalog**.
   The hardware catalog opens.
8. In the hardware catalog, navigate to the "Archive" directory.
9. Select the desired application and drag-and-drop it to the configuration table:

Desired external archive server	Application in the hardware catalog
Process Historian	• "Process Historian" for the PC station of the Process Historian • "Process Historian (stby)" for the redundant PC station of the Process Historian

10. Select **Station > Save and Compile** from the menu.
11. Close HW Config and change to SIMATIC Manager.

Additional information

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

12.10.9 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*.

12.10.10 Displaying archive data on the OS client

Messages and process values

You can display messages and process values stored in the archives of the Process Historian on the OS client.

Note

If you use the Process Historian, nothing needs to be adapted or downloaded on the clients.

See also

Generating and Downloading of Server Data (Page 271)

12.10.11 Displaying archive data of the Process Historian with the Information Server

Introduction

The Information Server allows you to access data archived with Process Historian (for example, messages, process values and logs).

Functions and possibilities

You can find detailed information on the functions and possibilities in the documentation for the Information Server.

The following table shows important functions in the SIMATIC Information Server.

Function	Purpose
Templates	Report templates for process values, messages and recipe data
Reports	Select pre-configured reports and: • Show • Export • Move • Delete
Exports	Manage exported reports: • Open • Move • Delete • Load pending exports
Subscriptions	Overview of automatically generated reports (subscriptions)
Excel templates	Manage Excel templates: • Create folder • Load files

Additional information

You can find additional information on this in the documentation of the Information Server.

12.11 Using the Report Designer

12.11.1 Overview of Reports with the Report Designer

Reports with the Report Designer

The Report Designer provides functions for creating and outputting reports. 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.

Note

Always save your customized layouts under a new name.

12.11.2 Layouts in the Report Designer

Introduction

The Report Designer has two different layouts:

- Line layout
- Page layout

Line layout

You can use this layout to sequentially print all messages generated in process mode. This means: 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*.

12.11.3 Reports in the Report Designer

Introduction

The Report Designer offers two different types of reports. You use the layouts provided by the Report Designer based on the type of report you require:

- Message sequence report: Line layout
- Archive and user reports: Page layout

Message sequence report

You can create a message sequence report in the Report Designer. To do so, create a line layout and select the message blocks in Alarm Logging you 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*.

12.12 Archive values in process pictures

12.12.1 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
- FunctionTrendControl: Represents the correlation of two process values.

Additional information

- Section "Working with the Online Trend Control (Page 245)"
- Section "Working with the FunctionTrendControl (Page 248)"

12.12.2 Trend Display and Trend Display Configuration in Process Mode

Overview

In process mode, values are displayed in the form in which you configured them in the Graphics Designer. The plant operator has the option of using the toolbar to work with the trend display.

- Show/hide trend displays
- Scroll through displays
- Underlay trends with areas

In addition, the plant operator can assemble additional new trend displays directly in process mode and view the measured values of process tags in trend displays. To do this, the plant operator must have the appropriate user permission.

Additional information

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

12.13 Working with the Online Trend Control

12.13.1 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.

12.13.2 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.

12.13.3 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 246)
2 (optional)	Properties of a tag are applied automatically. (Page 246)

12.13.4 How to insert an Online Trend Control

Procedure

1. Open the required picture in the Graphics Designer.
2. If the "Controls" dialog box ("Controls" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbar**
   - In the submenu, select the "Controls" check box.
     The "Controls" dialog box opens.
3. In the "Controls" dialog box, select the object "WinCC OnlineTrendControl" in the tree view in the "AktiveX-Controls" folder.
4. Use the mouse to navigate to the drawing area.
   The mouse pointer becomes a small icon for a control.
5. Hold down the mouse button and drag open a rectangle large enough to accommodate your trend display.
   The "WinCC OnlineTrendControl Properties" dialog box opens.
6. Set the properties for the "WinCC OnlineTrendControl".
   You can find additional information on the individual input boxes and option buttons in the online help for the *WinCC Information System*.
7. Click "OK".
   The "WinCC OnlineTrendControl Properties" dialog box closes.

12.13.5 How to copy properties for the value axis automatically

Introduction

The following data for visualizing the range of values of a tag in the OnlineTrendControl in the process control is automatically copied from the corresponding PCS 7 block:

- A minimum value for the displayed range
- A maximum value for the displayed range

The "S7_xtrend" attribute at the block I/O of the tags to be displayed is used at the associated block type for this function.

Procedure

1. Select the desired block type in the master data library, for example, "MonAnL", and double-click the block type.
   The block editor opens.
2. In the block interface, select the block I/O to be displayed in OnlineTrendControl, for example, the block I/O "PV_Out".
3. Select the "Object Properties..." command in the shortcut menu. The "Properties - Tag" dialog box opens.

4. Go to the "Attributes" tab.
5. Check if the following entry is made in the "Attribute" column:
   * For structured tags: "S7_xtrend"
   * For non-structured tags: "S7_trend"
   If there is no entry, insert the appropriate row.
6. Select the top row in the "Attribute" column.
7. Select the entry for the tag attribute from the drop-down list.
8. In the corresponding row of the "Value" column, enter the block I/Os of the same block that contain the maximum and minimum value of the display range. Take into consideration the required representation in the "Value" column:

Attribute	Value
S7_xtrend	<structure element name,minimum value,maximal value>
S7_trend	<minimum value,maximal value>.
Structure element name and I/O names are always separated by a comma. **Example:** Block "MonAnL", attribute of the block I/O "PV_Out": attribute "S7_xtrend"; value "Value,PV_OpScale.Low,PV_OpScale.High"	

9. Click "OK".
   The "Properties - Tag" dialog box closes.
10. Save the block and close the block editor.
11. Update the instances of this block type in the CFCs of the project.
12. Compile the OS.

Result

The following fields are configured automatically in the "Value axes" tab in the properties of the OnlineTrendControl.

- The "Automatic" check box is selected.
- The 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.

You can find additional information about configuring the OnlineTrendControl in the section "How to insert an Online Trend Control (Page 246)".

12.14 Working with the FunctionTrendControl

12.14.1 Function of the Function Trend Control f(x)

FunctionTrendControl

You can use the FunctionTrendControl 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.

Contstraints

You can only display cyclic-continuous tags in the FunctionTrendControl. Both archive tags must have been assigned the same archiving conditions when you visualize a pair of values from the archive: The cycle of both tags must match.

Note that you can only download tags from the archive of one server for an axis pair.

Trend values are provided from the following archives:

- Process value archive
- Online tags

12.14.2 Tag connection in the Function Trend Control

Tag connection in the FunctionTrendControl

The properties of the FunctionTrendControl provide several options for connecting tags to the function:

Tag type	Meaning
Archive tags	Values from a TagLogging archive
Online tags	Values taken directly from the process

Note

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

12.14.3 How to insert a Function Trend Control

Procedure

1. Open the required picture in the Graphics Designer.
2. If the "Controls" dialog box ("Controls" tab) is not visible, perform the following steps:
   - Select the menu command **View > Toolbar**
   - In the submenu, select the "Controls" check box.
     The "Controls" dialog box opens.
3. In the "Controls" dialog box, select the object "WinCC FunctionTrendControl" in the tree view in the "AktiveX-Controls" folder.
4. Move the mouse pointer to the drawing area.
   The mouse pointer is transformed into a small control cursor.
5. Hold down the mouse button and draw a rectangle matching the size of your trend display.
   The "WinCC FunctionTrendControl Properties" dialog box opens.
6. Set the WinCC "FunctionTrendControl" properties.
   Information about the individual input boxes and check boxes is available in the *WinCC Information System* online help.
7. Click "OK".
   The "WinCC FunctionTrendControl Properties" dialog box closes.

Time-of-Day Synchronization 13

13.1 Setting the TOD Synchronization

13.1.1 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.

13.1.2 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.

13.1.3 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.

13.1.4 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".

13.1.5 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.

13.1.6 How to Connect a DCF77RS or GPSDEC

Requirements

- The COM interface is set in the Control Panel.
- The extended FIFO setting must be switched off.
- The DCF77RS reception service must be installed, parameters must have been assigned, and it must have been started.

Synchronizing OS servers

1. Open the WinCC project of the OS server.
2. 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".

13.1.7 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 the time from a specific computer" option is important when setting the time synchronization of OS servers within a domain: The computer names you enter in this dialog correspond to the names of the domain controllers in the Windows network.
  The OS server gets the time from the domain controller by default.
- The "Let time be set by external (third party) components" option is not applicable in the PCS 7 environment.

13.1.8 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.

13.1.9 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.

13.1.10 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".

13.1.11 Time synchronization in a domain

Requirement

All operator stations must be installed in one domain.

Rules

Note

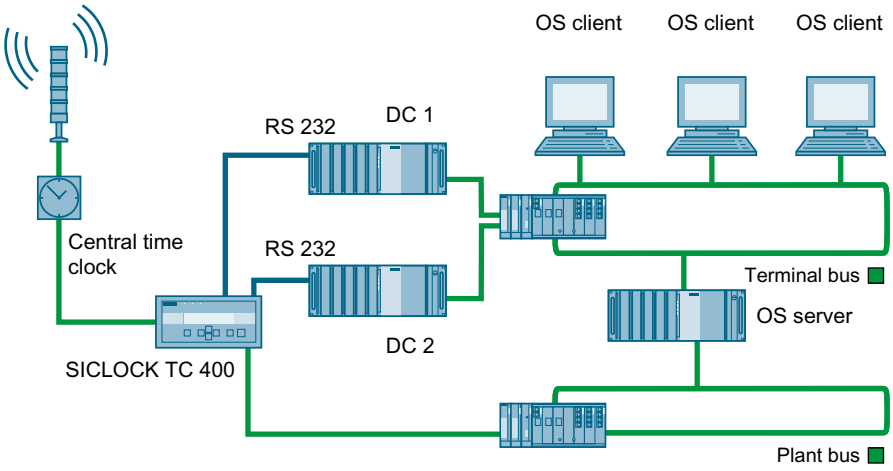
Before you set the time synchronization parameters for a PCS 7 plant in a Windows domain, create a detailed plan of your network structure. This plan must contain all the relevant information for time synchronization:

- Which computer is the domain controller?
- Which computers belong to the domain and receive the time of day from the domain controller?
- Which computers do not belong to the domain and where do they obtain their time from?
- Which computers are time masters and which are time slaves?

Time synchronization of all components of a PCS 7 plant in a domain

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

The following figure shows a theoretical system configuration:



Time synchronization of the OS servers via the terminal bus

The domain controller is synchronized by a high-precision central plant clock.
The OS servers are synchronized by the domain controller via the terminal bus. They act as passive time-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 synchronization of the OS client via the terminal bus

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

Additional information

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

13.1.12 How to synchronize with a domain controller

Synchronizing OS servers

Carry out the following steps for each OS server.

1. Open the WinCC project of the OS server.
2. In the WinCC Explorer tree view, select the "Time Synchronization" editor.

3. Select the **Open** command from the shortcut menu.
   The "Time Synchronization" dialog box opens.
4. Select the "Synchronization via terminal bus (slave)" check box.
   This activates all associated 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. Select 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. Select the "Synchronization via 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".

Additional information

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

Sign-of-life monitoring

14

14.1 Configuring lifebeat monitoring

14.1.1 Overview of Lifebeat Monitoring

Introduction

The lifebeat monitoring function is used to monitor the functionality of all AS and OS of the process control system. A process control message is generated if an AS or OS do not respond to a lifebeat request.

Note

The process control system SIMATIC PCS 7 has a cross-sector Asset Management System. It provides the user with additional extensive possibilities for preventive and foreseeable diagnostics and maintenance of the plant.

Additional information: SIEMENS portal process automation (https://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. Requirement: All the components to be monitored are connected to a continuous network and assigned to the lifebeat monitor. The monitoring is performed in a cycle that you can specify when configuring lifebeat monitoring.

You configure lifebeat monitoring in the WinCC "Lifebeat Monitoring" editor.

Note

Lifebeat monitoring and maintenance station

If you are running a maintenance station in the plant, configuration of the lifebeat monitoring with "Lifebeat Monitoring" is prohibited.

Monitoring an automation system

On an automation system, a process control message is generated in two situations:

- The lifebeat monitoring reads the current operating state from the AS: The lifebeat monitor generates a system message when a status transition such as RUN to STOP is detected.
- The lifebeat monitoring sends monitoring requests to an AS. If, for example, the power supply or device has failed or the connection has been interrupted, the AS can no longer react to the monitoring request and a process control message is generated.

Monitoring an operator station

Lifebeat monitoring of an operator station is performed via a monitoring request – as is the case for an automation system.

You can find a detailed description of the configuration under "Lifebeat Monitoring" in the *WinCC Information System* online help.

14.1.2 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.

14.1.3 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.
  Additional information is available in the *WinCC Information System* online help.

Note

Lifebeat monitoring and maintenance station

If you are running a maintenance station in the plant, configuration of the lifebeat monitoring with "Lifebeat Monitoring" is prohibited.

Procedure

1. In the WinCC Explorer tree view, select the "Lifebeat Monitoring" editor.
2. Select the **Open** command from the shortcut menu.
   The "Lifebeat Monitoring – [Name of OS]" dialog box opens.
3. Click "Add".
   This inserts a new row in the "Device List" table.
4. Double-click the field in the "Device Name" column and enter a unique, descriptive device name, such as the plant name for the component from the plant hierarchy that you created in SIMATIC Manager.
5. Double-click the field in the "Device Type" column and select the device to be monitored from the drop-down box.
   Select, for example, the entry "AS-4xx" if you are using a CPU 4xx or the entry "OS" if you 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 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 15

15.1 Interconnection of Tags of Different OS Servers

Introduction

You can interconnect tags of different OS servers in a process picture and display the tags in a process picture on the OS client. The process picture is stored on the OS server. Server-to-server communication is used for this purpose.

Configuration rules

To be able to use this function, observe the following when configuring:

- 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

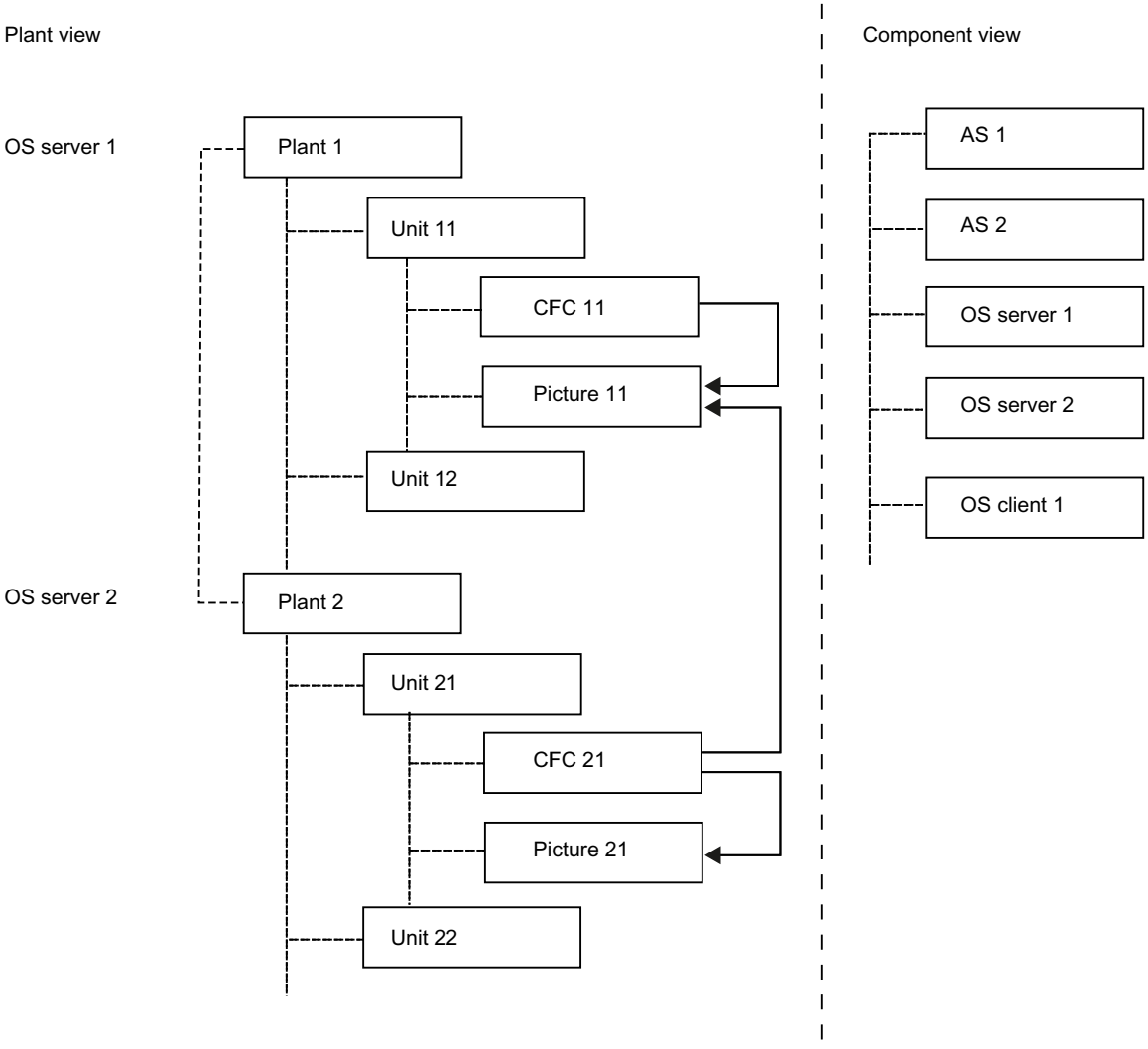
When downloading server data, observe these guidelines:

- 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.

15.2 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.

15.3 How to Configure Pictures with Tags of Different Servers

Requirements

- The OS servers and OS clients have been created.
- The path to the target OS has been specified.
- The AS-OS assignment has been made.
- All ES data have been configured, e.g., CFC charts or SFC charts.

Procedure

1. In SIMATIC Manager, open the component view.
2. Select OS server 1 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"

    Note

    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 the PCS 7 Maintenance Station 16

Overview

The PCS 7 Maintenance Station (MS) focuses on "Plant Asset Management" and enables preventive and predictive diagnostics and maintenance of the plant. In parallel with process control, the maintenance station also provides comprehensive maintenance information and functions for the system components (assets).

While the plant operator receives all process-relevant information and can intervene selectively in the process via the operator system (OS), the maintenance engineer inspects the automation system hardware and processes the associated maintenance messages and maintenance requests via the maintenance station.

The basis of a maintenance station is always an OS that provides these maintenance functions. An OS is specified as an MS when the OS is assigned during the creation of the diagnostic structure in the plant hierarchy.

Types and configuration

The maintenance station can be used as the following types and configurations:

- Maintenance Station Basic
  This type of maintenance station can be configured as an MS single-station system or as an MS multiple-station system.
- Maintenance Station Standard
  This type of maintenance station can be configured as an MS single-station system or as an MS multiple station system.
- SIMATIC PDM maintenance station
  The SIMATIC PDM MS is configured as an MS single-station system. This maintenance station displays the diagnostic information determined by SIMATIC PDM.

Additional information

You can find basic information on the engineering, configuration and process control of the maintenance station in the manual *Process Control System PCS 7; Maintenance Station*.

See also

Operator control and monitoring of the process mode via the Internet/Intranet (Page 292)

Server data

17

17.1 Downloading Server Data

17.1.1 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

PCS 7 Maintenance Station

If you are using a PCS 7 maintenance station in your project, allocate the server data as follows:

- The PCS 7 maintenance station requires the server data of all OS servers.
- For more information, refer to the *Process Control System PCS 7; Maintenance Station* manual.

Server-to-server communication

If you use process pictures in your project to which you want to interconnect tags from various OS servers, you must set up server-to-server communication. For server-to-server communication, you must also download server data to OS servers.

You can find additional information on this topic in the section "Interconnection of Tags of Different OS Servers (Page 265)".

17.1.2 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.

Monitor automation systems

For automation systems to be monitored on "OS clients with diagnostics view" or on MS clients (on an Engineering Station), you will have to download the server data of the respective OS servers and the Maintenance Station to these PC stations.

17.2 Determining the Standard Server for OS Client

17.2.1 How to Assign the Standard Server

Introduction

You need to assign a default server to some components for OS clients.

Note

Always assign the same OS server as the default server to OS clients with the same server data.

Note

When using a reference OS, you only assign default 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 "Alarms" component in the "Symbolic computer name" column.
3. Select the default server from the drop-down list.
   The drop-down list contains the symb. computer names of all server data loaded on the client.
4. Repeat steps 2 and 3 for all remaining components.
   - SSM (Split Screen Manager)
   - User archives
5. Click "OK".

Result

Default server for the "Alarms" component:

- For operations which are carried out on an OS client, operator input messages are generated and saved on the default server.
- The global settings for the group displays, the extended status display and the extended analog display are saved for the "User-configurable message classes" function on the default server.
- The global settings for the message lists for the "Define message colors for individual columns" function are saved on the default server.

Default server for the "SSM" component:

- Trend groups that are composed on an OS client are saved on the default server.
  If no default server for the SSM component is configured on the OS client, the composed trends are saved locally on this OS client. These trend groups cannot be displayed in the OS server project.
- Screen compositions executed on an OS client are saved on the default server and its redundant partner.
  If no default server is specified, the executed screen compositions of the OS client are stored locally on this OS client. These screen compositions cannot be displayed in the OS server project.

Downloading and Activating a Project 18

18.1 Overview of Downloading a Project

Introduction

Before you can run a project in process mode, you must transfer the data you configured to the various OS servers and OS clients.

Note

Before attempting to download, ensure that there is sufficient memory capacity available on the PC station hard disk for process mode (OS server, OS clients or OS single station) so that the project and server data can be accommodated.

Options for downloading a project

You have two options for downloading in PCS 7:

Type	Description
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.

18.2 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 82)"
Perform the OS configuration, for example create process pictures or OS reports	Section "Overview of the reports with the report designer (Page 241)"
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 271)"

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 39)" 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*

Step completed	Additional information
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 271)"

18.3 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

18.4 How to Download Multiple Operator Stations

Introduction

If you want to perform the "Download entire project" or "Download Changes" function for multiple operator stations, use the "Compile and Download Objects" dialog box.

Requirement

All editors in WinCC Explorer are closed.

Procedure

1. In SIMATIC Manager, open the component view.
2. 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 85)".
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.

NOTICE
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.

18.5 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.

18.6 How to Activate a Project

Introduction

The following description applies to activating a project on an OS server and on an OS client.

Procedure

1. Open the WinCC Explorer on the OS you want to activate.

   Note

   Activate the operator stations directly on the associated computer. It is not possible to activate any OS on the Engineering Station.

2. Select the **File > Open** command.
3. Navigate in the file system to the ".../[project path]/[name of OS]" folder which contains the corresponding "*.mcp" file.
4. Click "Open".
   The project opens.

   Note

   The last project you opened is recovered if you open a new session of WinCC Explorer.

5. Select the menu command **File > Activate**.
   Process mode is activated.

18.7 Archiving with Process Historian

After the "Process Historian" PC station starts, the Process Historian is ready for operation.

You can find additional information on this in the *Process Historian* manual.

Downloading changes to a project 19

19.1 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

NOTICE
Never make changes to a project directly on the OS because this will prevent you from being able to use the "Download changes" function and you will have to 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 created operator stations as the reference OS, be aware of the following:

NOTICE
If you load a change, you must always load this change to all operator stations (basic OS and the associated reference OS). Before loading changes to the operating stations again, **all** operator stations must have the current project configuration status loaded. If you do not do this for a reference OS, it is absolutely essential that you perform a complete download of this reference OS.

19.2 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 283)
- Changes in the component view (Page 283)
- Changes in CFC/SFC Charts (Page 284)
- Changes in Blocks and Block Instances (Page 284)
- Changes in WinCC Explorer (Page 285)

19.3 Project Changes in the Plant View

Downloading changes without stopping the OS

You can download the following changes in the plant view without having to stop the OS:

- Insertion of a folder in the plant view
- Relocation of a folder to the plant view
- Copying of a folder to the plant view
- Renaming and deleting of a folder in the plant view if it is a component of the higher level designation (HID)
- Renaming of the picture for the OS
- Subsequent activation of the "Derive Picture Hierarchy from the Plant Hierarchy" setting
- Renaming of the OS area
- 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

19.4 Project Changes in the Component View

Downloading changes without stopping the OS

You can download the following changes in the component view without having to stop the OS:

- Renaming, insertion, relocation and deletion of the AS
- Renaming, insertion, relocation and deletion of the S7 program

Note

When deleting an AS or an S7 program, tags and 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.

19.5 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

19.6 Changes in Blocks and Block Instances

Downloading changes without stopping the OS

The following changes in blocks and block instances can be downloaded without having to stop the OS:

- Renaming of "Sources" and "Blocks" folders
- Insertion and deletion of a block
- Renaming of a block in the symbol table
- Modification of a block address in the symbol table
- Modification of a block number in the block folder
- Modification of control and monitoring attributes of blocks
- Modification of control and monitoring attributes of a block instance
- Renaming, insertion and deletion of block instances in CFCs
- Modification of message texts
- Modification of block interfaces of a block type, for example, addition or deletion of a name, data type, or I/Os

Note

If you change a block I/O at an AS block in process mode, a stop of the AS may be required. Whether or not an AS must be stopped depends on the CPU type used.

19.7 Changes in WinCC Explorer

Downloading changes without stopping the OS

The following list only contains the settings in the WinCC Explorer that can be defined in the PCS 7-environment. Any settings made by PCS 7 itself are not listed here. You can download changes to these settings without having to stop the OS:

- Configuration of archives (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

19.8 Full download

Downloading the full program and stopping the OS

In certain cases, you lose the option to select the "Download changes" function.

Note

After the following changes are made, you can no longer use the "Download changes" function. The "Download changes" function becomes available again only after you have downloaded the entire project again.

- 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 20

20.1 Simulation of an OS

Introduction

You can simulate the process mode of an OS from SIMATIC Manager. With this simulation, you can, for example, check the display and functionality of your configuration data.

Simulation of an OS

Note

Note the following:

- At the time of the simulation, there is no communication between the various operator stations of your project. As a result, no current data from other servers can be displayed, for example, the data of another OS server in an Online Trend Control.
- Communication between the OS and the AS can be simulated.
  Requirement:
  The OS – AS and ES – AS connections need S7 connections with identical parameter settings at the OS and ES ends:
  - Local ID (e.g. S7_connection_1)
  - Module name (e.g. WinCC appl.)

  You can find additional information on this 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.

20.2 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 21

21.1 The "Text Library" editor in the WinCC Explorer

21.1.1 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 291)".

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 37)".

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 89)".

21.1.2 Relationship Between OS Compilation and the Text Library

Introduction

If you have to change the text library because you want to implement the unit or operator texts in different languages, note the following:

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 36)".

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:

NOTICE
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.

21.1.3 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.

21.2 Operator control and monitoring of the process mode via the Internet/ Intranet

Web Option for OS

The Web Option for OS enables you to use OS for operator control and monitoring functions over the Internet or Intranet in process mode. You require additional PCS 7 components for this.

Note

Some functions are not available or are restricted.

The following functions are basically available with the Web option for OS:

- Operator control and monitoring functions which are also used on an OS client
- Message lists which are opened user-dependently in exactly the same way as on an OS client. Messages can be acknowledged user-dependently.
- Display of picture hierarchy corresponding to the plant hierarchy
- Group display functions including the "Loop-in-Alarm" function
- Extended status display

Additional information

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

- Information on the configuration of the PC stations
- Availability of functions
- Additional information

21.3 Programming with scripts

21.3.1 Function of Global Script

Introduction

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*

21.3.2 Global Script - Programming with C Script

Introduction

Programming with C Script is used in the following cases:

- PCS 7 provides preprogrammed standard and internal functions.
- You can program specific project and standard functions with C script.
- You can create actions that run in the background in process mode.

Note

Note that actions are processed interpretively. The use of a large number of actions or very complex actions results in a higher system load. Moreover, many small actions cause more system load than a few large actions. You should replace extensive actions with custom DLLs (Dynamic Link Libraries).

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

Location of the programming

If you 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*

21.3.3 Global Script - Programming with VB Script

Overview

You can use VB scripts to program operator control and monitoring functions. VB scripts are executed in process mode.

Operator control functions

Operator control functions enable the plant operator to access graphical objects and tags in process mode. Examples of operator control functions are:

- Defining setpoints for tags
- Switching the language for a graphical object

Monitoring functions

To facilitate process monitoring for the plant operator, you can use VB Script to implement displays such as the following:

- Display of cyclic operations, for example, through flashing or color changes
- Display of process tag states, such as "Motor ON"

Location of the programming

If you wish to use functions and actions that go beyond the standard ones, you can program them in the WinCC Explorer at two locations:

- WinCC Editor "Global Script"
- WinCC "Graphics Designer" editor: at properties or events of graphic objects that are stored in the picture

Additional information

- Online help for *WinCC Information System*

21.3.4 Programming with VBA

You can use VBA to adapt the Graphics Designer to your own requirements. This allows you to simplify and automate the configuration process.

VBA is integrated in the Graphics Designer. Examples of available options are:

- Creation of user-defined menus and toolbars for adapting the Graphics Designer interface to your individual requirements.
- Creation of VBA macros for mouse-activated configuration tasks, for example, settings for levels and editing of objects. A VBA macro for editing objects enables you to quickly create a large number of objects with identical properties.

Further information

- Online Help for *WinCC Information System*

21.4 Overview of Additional Tools

21.4.1 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*.

Index

"

"Type" attribute, 157

@

@PCS7TypicalsAPL<Version>.pdl, 157
@TemplateAPL<Version>.pdl, 157, 159

A

Access protection, 32
Acknowledge bit, 144
Acknowledgment, 206
  of Signals, 206
Activating, 280
  Project on the Process Historian, 280
Active time master, 251
Actual trend, 248
Additional information, 79
  delete, 79
Alarm control, 167
Alarm Control, 167
  Inserting, 167
Alarm Logging, 226
  Configure, 226
Alarm system
  Settings in the OS Project Editor, 201
Applications, 190
Archive configuration, 226, 237
  Alarm Logging, 226
  Message archive, 226
Archive data
  Backing up, 224
  Displaying ~ from the Process Historian, 240
  Displaying on the OS client, 240
Archive report, 243
Archive tags, 45, 73, 74, 221
  Block object properties, 74
  Identifying, 74
  Process object view, 74
Archives, 108, 222, 223, 227, 230, 231, 244
  Archive configuration tasks, 230
  Configuration on the OS server, 223
  Configuration when using an external archive server, 225
  Configure, 225
  Creating, 231
  Defining tag properties, 231
  Editors, 222
  Process mode, 244
  Segment, 223
  Single segment, 223
  User Rights, 108
Archiving, 73, 221, 230
  Batch log, 236
  Messages and process values, 236
  Tag Logging, 230
Area assignment of messages, 98
Area-oriented, 84
Areas
  OS Project Editor, 98
AS-oriented, 84
AS-OS assignment, 63, 64
  OS area, 64
Asset Management, 269

B

Basic data
  Specifying, 98
Batch log
  archiving, 236
Batch logs
  archiving, 240
Bit number, 128
Block comment, 78
Block comments, 78, 79
  Faceplate, 78
  supplement, 79
  Window line, 78
Block icons, 65, 67, 68, 69, 162
  "Type" attribute, 157
  @PCS7TypicalsAPL<Version>.pdl, 157
  @TemplateAPL<Version>.pdl, 159
  Configuring, 162
  Connecting to a process tag, 162
  Defining the creation, 67
  Defining the type, 68
  Faceplates, 156
  Generating, 65, 69
  Generation procedure, 67
  Insert, 162
  Operating principle, 65
  Purpose, 156

Update, 69
Versions, 157
Block Instance, 71, 73, 75
Editing unit and operator texts, 73
Message Priority, 80
Messages, 75
Unit and Operator Texts, 71
Block instances, 284
Changes, 284
Block types, 71, 75
Editing Unit and Operator Texts, 71
Message priority, 80
Messages, 75
Unit and Operator Texts, 70
BlockComment, 78
Blocks, 284
Changes, 284

C

C action, 115
C script, 294
Central archive server, (See External archive server)
changes, 281, 282
Component view, 283
OS stop, 285
Overview, 282
WinCC Explorer, 285
Changes, 283, 284, 285
Block instances, 284
Blocks, 284
Charts, 284
Plant view, 283
Reference OS, 282
Channel Diagnostics, 295
Charts, 284
Changes, 284
Chip card, 108
COM interface
Smart card, 109
Communication Configurator, 295
Compilation mode, 84
Area-oriented, 84
AS-oriented, 84
specify, 84
Compile, 82, 83
Global settings, 83
Type of data, 83
Component view, 283
changes, 283
Compressed archive, 230
Computer properties, 98
Key shortcuts, 96
Keys, 96
Language setting, 96
Name of OS, 96
Process mode, 96
setting, 98
Starting applications, 96
Window, 96
Configuration, 22
Operator station, 22
Configuration tasks, 28, 29
Overview, 27
SIMATIC Manager, 28
WinCC Explorer, 29
Configure
Reference OS, 47
Configuring
Reference OS, 47
Coordinated Universal Time UTC, 252
Cross Reference, 190
Cross-reference lists, 190, 191, 192, 193
change to the application instance, 193
Corrections, 193
Generating, 192
Non-existent tags, 191
PCS 7, 191
Rewiring, 193

D

Data format, 230
Data storage, 277
DCF77RS, 254
Default server, 272
Assigning, 272
Destination OS, 45
Diagnostics, 42, 45, 261
Asset Management, 269
Lifebeat monitoring, 261
Maintenance Station, 269
Redundant operator stations, 42, 45
Direct link, 115
Disabling messages, 197
Domain, 257
Time synchronization, 257
Domain controller, 258
Synchronizing the time-of-day, 258
Download, 279
Separate OS, 279
Downloading changes, 275

Downloading the Entire Program, 275, 277, 278
Background information, 277
Executing, 278
Requirements, 275
Dynamic dialog box, 115
Dynamic display, 115
Dynamic objects, 114, 120, 121, 122, 123
Bar graph, 119
Block icon, 120
Configuration tasks, 121
configuring, 123
Control, 119
Custom, 120
Extended status display, 119
Faceplate, 120
Group display, 119
I/O fields, 119
Inserting, 122
Object properties, 123
Picture window, 119
Standard objects, 119
Status display, 119
User object, 120
User object template, 120

E

Editors, 91, 113
Graphics Designer, 113
ES tags, 116
Event text, 78
EventState, 128, 144
Example configuration, 213, 266
Global tag interconnection, 266
Horn, 213
Exporting, 182, 184, 291
Graphic Object Update" wizard, 184
Project editor, 98
Sequence, 184
Text Library, 291
Extended analog display, 138, 139
configuring, 139
Inserting, 138
Purpose, 138
Tag connection, 139
Extended status display, 126, 127, 128, 130, 133, 134
Configure, 134
EventState, 128
Import/export function, 126
Insert, 133
Overview, 126
Preparations, 130
Status table, 130
Tag connection, 133
Using, 127
External archive server, 25, 45, 221
Process Historian, 18
Redundant Process Historian, 239
External clock, 253
Time-of-Day Synchronization, 253

F

Faceplates, 65, 163
Block icon, 156
Calling, 155
Configuring, 162
Display types, 161
Group display, 161
Interconnecting objects, 163
Location, 155
Loop display, 161
Maximum number opened, 98
Structure type, 155
File type
pck, 271
Filter, 116
Function Trend Control
Inserting, 249
FunctionTrendControl, 248
Tag connection, 248

G

Global design
editing, 95
Global Script, 293
Global settings, 53, 54, 56, 57
Higher Level Designations, 56
OS Area Identifier, 57
Plant hierarchy, 54
GPSDEC, 254
Graphic Object Update" wizard, 182, 184, 185, 186
Exporting, 184
Import, 184
Tag connection, 185
Updating, 184
Using, 186
Graphics Designer, 113, 114, 122
Object, 114
Open picture, 122
Overview, 113

Group display, 141, 144, 146, 161, 195
Automatically generating a hierarchy, 151
Bit number, 144
Configuration, 144
configuring, 146
Defining the picture selection, 152
Display in process mode, 142
Dynamic display, 141
EventState tag, 144
Group display hierarchy, 195
Inserting, 145
Interconnecting with picture, 151
Interconnection with block/process tag, 147, 148
Interconnection with picture, 149
Message classes, 144
Process mode, 141
Group display hierarchy, 195
Calculating, 195

H

Hardware Configuration, 39
Overview, 39
HID, 56
setting, 56
Hiding alarms, 217
Smart Alarm Hiding, 218
Higher Level Designations, 56
setting, 56
Horn, 204, 207, 211, 213, 214, 215
Acknowledgment, 214
Configure, 211
Example configuration, 213
OS clients, 213, 214
OS server, 215
Settings, 207
Hotkey
Defining keyboard shortcuts, 95
HW Config, 39

I

Import, 182, 184, 291
Graphic Object Update" wizard, 184
OS Project Editor, 98
Sequence, 184
Text Library, 291
Input/output fields, 140
Configuring, 140

K

Key shortcuts, 93, 96
Keyword, 78

L

Language, 36, 37
SIMATIC Manager, 36
WinCC Explorer, 37
Language for display devices, 76
Language setting, 96
Languages, 35
Layout
Specifying, 98
Length, 119
Tag name, 119
Lifebeat monitoring, 261, 262
Configure, 262
Line layout, 242
Local
Operator permission, 111
Local standard time, 252
Location, 193
change, 193
Long-term archiving, 73
Loop display, 161

M

Maintenance Station
Asset Management, 269
Management, 33
Projects, 33
Master data library, 27
Message archive, 221
Message assignment, 207
Message assignment detail area, 207
Settings, 207
Message classes, 144
Group display, 144
Message configuration, 101
Settings, 101
Message display
Authorization check, 98
Extended message line, 98
Group display hierarchy, 98
Message filter, 98
Operator input messages, 98

Smart Alarm Hiding, 98
Sorting of message pages, 98
Message lists, 203
Defining properties, 203
Properties, 202
Message number range
Message priority, 80
Message priority, 81
Specifying, 81, 98
Message Priority
Message lists, 80
Message number range, 80
Message sequence report, 243
Message system
Alarms, 201
Configuration, 197
Settings in the Alarm Logging Editor, 201
Settings in the OS project editor, 199
Message window, 167
Messages, 75, 76, 218
Block comment, 78
BlockComment, 78
Configuring, 76
Disable, 197, 216
Event text, 78
Hiding manually, 218
Unlocking, 216

N

NetPro, 48
Network connections, 48
Configuring, 48
Non-existent tags, 191

O

Online Trend Control, 245
Configuration tasks, 245
Copying values automatically, 246
Inserting, 246
Tag connection, 245
Operating principle, 205
Signal tags, 205
Operator authorization, (See User rights)
Operator permission
Local, 111
Operator station, 22
Configuration, 22
Operator texts, 70
OS, 40, 42, 44, 85, 93, 287
Basic, 31
compiling and downloading, 88
configuring, 40
inserting, 40, 42
Properties, 93
Reference, 31
separate compilation, 85
Setting properties, 44
Simulation, 287
OS Area Identifier, 57, 58, 61
Global settings, 58
Specific settings, 58
specify, 58
Updating, 61
OS client, 25
OS clients, 213, 214
Acknowledgment, 214
Horn, 213, 214
OS Project Editor
Exporting, 98
Import, 98
Overview, 98
OS server, 25, 215
Horn, 215
OS simulation, 287
OS-Server, 82, 271
Assigning, 271
Compile, 82
Out of Service, 197
Overall archive, 223

P

Page layout, 242
Passive time master, 251
PC station, 40
Changing the configuration, 50
Checking the configuration, 50
Configuration in connections without a SIMATIC CP, 51
pck
File type, 271
PCS 7 OS
Overview, 21
PCS 7 Operator Station, 22
Picture, 64, 65, 122
Insert, 65
Open, 122
Selection via group display, 152
Picture hierarchy, 59
Apply, 59

Picture name, 60
specify, 60
Picture objects, 182, 184, 191
Exporting, 182
Import, 182
Updating, 184
Picture Tree Manager, 59, 105, 194
Picture hierarchy, 59
Picture name, 59
User Rights, 105, 194
Picture window, 188, 189
Using, 189
Plant configuration
Process Historian, 233
Plant hierarchy, 21, 54, 59, 64
Global settings, 54
Picture, 64
Picture Tree Manager, 59
Process picture, 64
Plant view, 283
Plant View
Changes, 283
Preparatory work, 62
Print job, 242
Process control messages, 197
Process Historian, 221, (See External archive server)
Activating, 280
Configuration of archiving routines, 237
Configuration overview, 238
Configure, 239
External archive server, 18
Plant configuration, 233
Redundant, 236
Process messages, 197
Process mode, 96
Process object view, 63, 67, 74
Archive tags, 74
Create block icons, 67
Cross-reference lists, 191
Picture Objects" Tab, 191
Process picture, 64, 65, 113, 155
Additional options, 155
Insert, 65
Plant hierarchy, 64
Requirements for configuration, 113
Process value archive, 221, 230
Project library, 27
Project properties, 93, 95
setting, 95
Projects
managing, 33
Projects,, 33
Properties
Message lists, 202

R

Recirculating archive, 221
Redundancy, 251
Time-of-Day Synchronization, 251
Redundant Process Historian, 239
Reference OS, 31
Configure, 47
configuring, 47
Report Designer, 241, 242, 243
Line layout, 242
Page layout, 242
Print job, 242
Reports, 243
Reports, 243
Rules
Archive configuration, 237
Runtime window
Number, 98

S

Scope, 295
Segment, 223
Server data, 271, 277
Download, 271
generating, 271
Setting up the PC Stations, 40
Settings, 207, 209
Horn, 207
Message assignment detail area, 207
Message configuration, 101
Signal assignment detail area, 209
SICLOCK, 251
Signal assignment, 209
Signal assignment detail area, 209
Settings, 209
Signal tag, 205
Operating principle, 205
Signals, 206
Acknowledge, 206
Sign-of-life monitoring, 262
Process mode, 262
SIMATIC PC station, 40
Simulation, 287
OS, 287
Starting, 287
Single segment, 223

Single segments
Number, 229
storage space, 229
Smart Alarm Hiding
Hiding alarms, 218
Smart card
COM interface, 109
USB interface, 110
Write, 109, 110
Special characters, 83
Specific settings, 53, 54, 56, 57
Higher Level Designations, 56
OS Area Identifier, 57
System attributes for operator control and monitoring, 54
Standard language for display devices, 290
Standby OS, 45
Static Objects, 114
Station Configuration Editor, 50
Status display, 125
Configuring, 125
Status table, 130
STEP 7 tags, 116
storage space
Archives, 227
Structure type, 155
System attributes for operator control and monitoring, 54

T

Tab
Graphics runtime, 97
Runtime, 97
Tag connection, 115, 116, 185, 267
change, 185
Tag selection dialog box, 116
Tag interconnection, 265
Different OS servers, 265
Tag Logging
Archive configuration, 225
Using an external archive server, 225
Tag name, 119
Length, 119
Tag selection dialog box, 116
Filter, 116
Tag source, 116
Tag source, 116
TagLogging Fast, 225
TagLogging Slow, 225
Tags, 117
Location, 117
Target system, 252
setting, 252
Target trend, 248
Template file, 176
Text Library, 289, 290, 291
Import/export, 291
OS compilation, 290
Texts, 89
multilingual, 89
Time format, 252
Time Master, 251
Time period, 223
Time slave, 251
Time synchronization, 254, 257
Domain, 257
Terminal bus, 254
Timebase, 252
Time-of-day synchronization, 251, 253, 256
Workgroup, 256
Time-of-Day Synchronization, 251, 252, 255
Coordinated Universal Time UTC, 252
External clock, 253
Local standard time, 252
Plant bus, 255
Redundancy, 251
Tools, 295
Trend Display, 244, 245
Online Trend Control, 245

U

Unit and Operator Texts, 70, 71, 73, 291
adapting, 71
Block Instance, 71
Block type, 71
Block types, 70
Change in text library, 291
edit, 73
editing, 71
Unit texts, 70
Update cycle, 93
USB interface
Smart card, 110
User, 105
User Administrator, 103
User cycle
Configuring, 94
User groups, 105
User object, 170
create, 181
Generating, 170

User object template, 182, 186
create, 186
Graphic Object Update" wizard, 182
User object templates, 176
Template file, 176
User Objects, 168, 170, 171, 173, 174, 176
Advantages, 170
Application, 168
Configuration tasks, 170
configuring, 171
editing, 176
Inserting, 174
interconnecting with block, 174
Location, 168
Programming properties, 173
saving, 174
User reports, 243
User rights, 108
Chip card, 108
User Rights, 105, 107, 194
Archives, 108
For operation in faceplates, 104
For Web applications, 103
Objects in the Graphics Designer, 108
PCS 7, 105
Picture Tree Manager, 105, 194
Reaction to absent user rights, 103
setting, 103, 107
Tag Logging, 108
User-configurable message classes, 18

V

VB script, 294
VBA, 295
VBS action, 115

W

Web client, 292
Web Diagnostics client, 292
Web Diagnostics server, 292
Web Server, 292
WinCC Explorer, 91, 285
changes, 285
Editors, 91
Help, 91
PCS 7, 91
WinCC tags, 116
Window, 96
Window line, 78
Workgroup, 256
Time-of-day synchronization, 256
Time-of-Day Synchronization, 256
Write
Smart card, 109, 110