

SIEMENS

SIMATIC

Process Control System PCS 7 WinCC Basic Process Control

Manual

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Safety Guidelines

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Warning

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Caution

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

Note

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We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

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Important Notes

Purpose

The WinCC User Guide® describes:

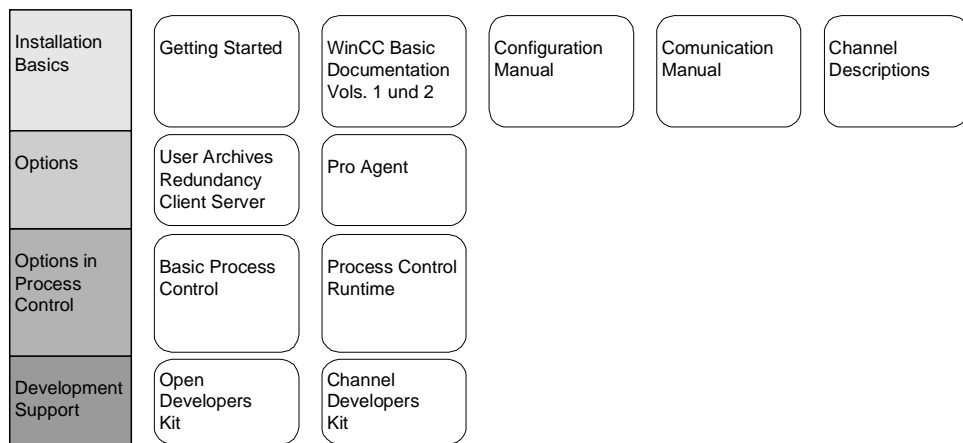
- the structure and function of WinCC and its components
- how to set up system-specific WinCC projects
- how to use WinCC at runtime

The User Guide is for WinCC V5.0

and the Optionpack PCS 7 V5.1

Position within the Information Environment

The User Guide is part of the documentation on SIMATIC® HMI®. All the documentation on WinCC is listed below.

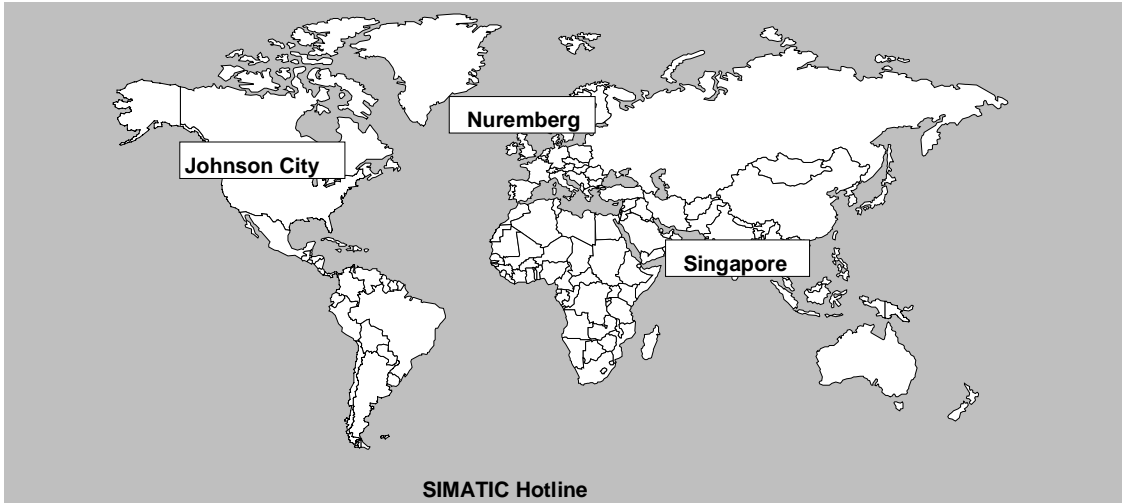


Documentation	Contents
Getting Started	Uses a configuration example to show beginners how to proceed step by step through a project, and introduces WinCC's overall functionality.
WinCC V5 Volume 1: System Overview Software Protection ControlCenter Server Data Channels Report Designer User Administrator Volume 2: Graphics Designer Alarm Logging Tag Logging Text Library Global Scripts CrossReference	Supplies information <ul style="list-style-type: none"> • on interrelationships in WinCC • on how software protection works • on the structure, method of operation and use of WinCC Explorer • on variables and variable groups • on communication between WinCC and the process • on creating and editing layouts for printing in Report Designer • on assigning user rights in User Administrator • on generating process maps in Graphics Designer • on configuring, processing and archiving messages in Alarm Logging • on configuring, processing and archiving measured values in Tag Logging • on configuring multiple-language texts in Text Library • on compiling C functions and actions in Global Script • on generating lists of cross-references with Cross Reference
Configuration Manual Volumes 1, 2 and 3	Supplies information <ul style="list-style-type: none"> • on configuring in WinCC, with examples for illustration • on special aspects of configuring • on the development environment for scripts, C functions and actions (C course) • on the graphics objects in Global Library
Communication Manual Volumes 1 and 2	Supplies information <ul style="list-style-type: none"> • on links to SIMATIC via PROFIBUS, Industrial Ethernet and OPC • on communication drivers and how they are configured, using examples for general links by way of illustration • on special aspects of configuring

Documentation	Contents
Channel descriptions	Supply information for communication drivers <ul style="list-style-type: none"> • on addressing variables in the automation system • on parameterizing the communication partners
WinCC Options User Archives Client Server Redundancy	Supplies information on the options <ul style="list-style-type: none"> • User Archives: creating and using user archives • Client-Server: structure and use of WinCC in a client/server system • Redundancy: structure and use of redundant systems
ProAgent	Supplies information on the ProAgent option (process diagnosis) <ul style="list-style-type: none"> • How to configure system-specific process diagnosis • How to trace process errors and identify their causes
Basic Process Control	Supplies information on the process-control options of WinCC <ul style="list-style-type: none"> • Storage • Picture Tree Manager • Split Screen Manager • Chipcard • Lifebeat Monitoring • Video • Time Synchronization
Process Control Runtime	Supplies information on the process-control options of WinCC <ul style="list-style-type: none"> • Operation at runtime
Open Developers Kit	Explains programmers how to use WinCC's API functions and how to access the data
Channel Developers Kit	Explains how to develop communication drivers for connecting WinCC to any target system

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1 System Overview

The following describes what WinCC configurators need to consider and can prepare when upgrading from WinCC V4.0 to V5.0.

WinCC V5.x is downward-compatible to V4.0.

Upgrading an existing operator station (OS) configuration (single-user or client-server system) from V4.0 to V5.0 can be completed in just a few easy steps.

Each client-server system can be **upgraded individually** and independently of one another.

Proceed as follows:

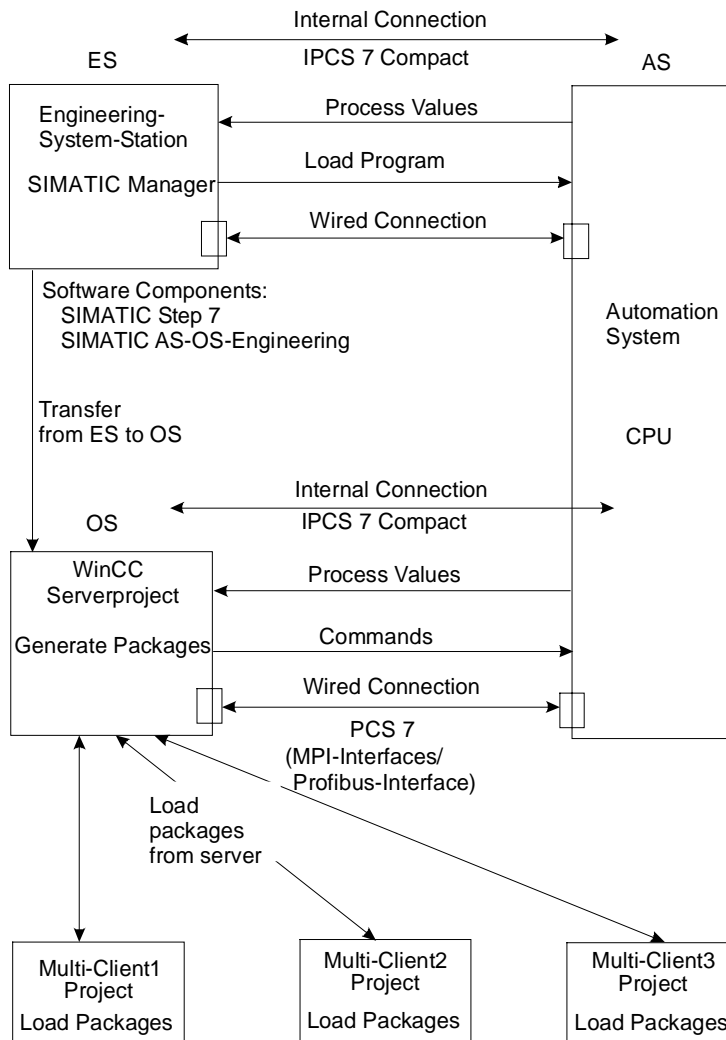
1. Deactivate the WinCC project on the server
2. Install WinCC V5.0 on all operator stations
3. Convert the configuration data
4. Activate the WinCC project on the server

Afterwards, the system can be operated as before. All functions will be available as usual.

1.1 Distributed Systems in the PCS 7 Environment

The principle picture structure (overview area, workspace and button area) as well as the base data are generated - as before - in the server or multi-client projects by the Process Control System Wizard.

With PCS 7, WinCC for the configuration of operator stations is included in the Engineering System (SIMATIC Manager). The multi-clients can be set up on the Engineering System (ES). Tags are imported from the ES to the operator stations (WinCC server) via the SIMATIC Manager function "Transfer AS/OS Connection Data". The transfer only takes place from the ES to the operator stations. Packages (data packages) are only generated on the WinCC servers. Afterwards, the generated packages can be loaded into the multi-client projects.



Picture: Hardware Components, Transfer and Packages

Note:

When transferring to an OS, the configuration data will only be available on the multi-client after the package has been generated on the OS (WinCC server) and loaded onto the multi-client.

1.1.1 Server Configuration

In the PCS 7 environment, the distribution occurs according to the technological hierarchy. In each server project, one or more areas of the hierarchy are configured. Configuration is performed as before.

The base data – as before – is created with the Wizards of the Process Control options (Base Data editor in the WinCC Explorer).

The statements made in the "Picture Configuration" chapter apply to the configuration of tags.

1.1.2 Multi-Client Configuration

A PCS7 project can be created completely on the ES. Via the commands "Target System" / "Load" in the SIMATIC Manager, a WinCC project can be loaded onto the OS. To obtain identical multi-client projects, a multi-client project can be created on the ES and be loaded to the various operator stations by modifying the target path in the SIMATIC Manager.

Many multi-client project settings, such as tag links, must be made directly on the multi-client. If the multi-client is remotely located, the settings can be made via "LapLink" or "PC Anywhere".

The loading of packages must be performed on-site at the multi-client.

It is not possible to configure the picture hierarchy on the multi-client. Instead, a hierarchy overview of all server projects loaded by packages is provided in runtime.

Changing the Package Name

Packages loaded on a multi-client are displayed in the data window of the WinCC Explorer under "Server Data". The package name - a symbolic computer name - is composed of the project name and the computer name of the server on which the package was generated. Since the symbolic computer name is normally longer than the available button width in the overview area of WinCC runtime, the symbolic computer name should be shortened appropriately (it should still be possible to recognize the server assignment).

In the WinCC Explorer, select "Server Data" and open its pop-up menu via a right mouse button click. From the pop-up menu, select the "Preferred Server" entry to open the "Preferred Server Configuration" dialog. Click on the symbolic computer name and enter a new meaningful name. If the symbolic computer name is changed and the "Package Properties" dialog exited with a click on "OK", a warning message will be displayed pointing out that all configuration data addressed via the old symbolic computer name will become invalid. All configuration data must employ the new symbolic computer name.

1.1.3 Information on Configuring Distributed Systems in the PCS 7 Environment

1.1.3.1 Picture Configuration

Overview pictures (BPC option) contain 16 fields. On the client side, it is not necessary to note how these fields are assigned (in the clients) in order to set them up with little effort. The base data takes into account the behavior of the client and the multi-client and is delivered with the product. The user does not have to assign fields. The picture hierarchy areas of all server projects loaded by packages are automatically displayed in runtime.

The order of the areas on the multi-client takes into account the order of the areas within the server projects. The order of the servers on the multi-client is determined by the order of the package imports. The system ensures that the hierarchy is presented identically on all multi-clients.

Note:

It is recommended to use the standard functions of the Split Screen Manager to configure picture changes.

Example:

Server Project A:

Customer configures (either via the Picture Tree Manager on the operator station, or by mapping the technological hierarchy) a picture hierarchy with the areas X1, X2 and X3.

Server Project B:

Customer configures a picture hierarchy consisting of the areas Y1 and Y2.

Now, the customer generates packages on both server projects and loads them onto:

- Multi-Client A in the following order: first Server Project A, then Server project B
- Multi-Client B in the reverse order

No picture hierarchy is configured on the multi-client in V5.0. Instead, the entire hierarchy covering all server projects is displayed in the overview area during runtime.

In runtime, the areas are displayed in the following order on both multi-clients: Y1, Y2, Y3, X1, X2. Note that the order of the areas is determined by the order of the package imports on the multi-client.

The Split Screen Wizard (SSW) offers two display types for the overview area in runtime.

The multi-client server view and the SIMATIC standard view. In the multi-client server view, only 12 area selection buttons plus 6 server selection buttons are displayed.

Pictures from multi-clients cannot be included in the overview pictures, since they are not contained in a picture hierarchy. However, they can be opened in the workspace or a process window using the function "Picture via Name".

1.1.3.2 Message Configuration

All required data is provided by the Alarm Logging Wizard and the base data. The configuration of the Alarm Controls is not necessary.

To open a measuring point picture as a process window, the WinCC standard function "Loop in Alarm" is integrated into the function of the same name on the PCS 7 system. The WinCC standard function "OpenPicture" can not be used in this case. Additional information pertaining to this topic can be found in the chapter "Loop in Alarm Function".

1.1.3.3 User Authorizations

Pictures and tags are created in the same manner as in WinCC.

Note:

The configuration of the user authorizations must be performed on the server project and the multi-client project.

The configuration of the user authorization matrix on the multi-client is only possible after the packages of all server projects with configured picture hierarchies (Picture Tree Manager) have been loaded. The areas of a server project are only displayed in the columns of the multi-client's user authorization matrix, if the package of the server project has been loaded in the multi-client project.

If configuration changes are made to the server project on the area level of the Picture Tree Manager hierarchy, the package of the server project must be generated again, loaded onto the multi-client and the authorization matrix be changed accordingly.

1.1.3.4 Storage

The functions of "Storage" continue to be configured on the server or a client, the multi-client is not a configuration station. Unlike the Storage dialog in a server project, the Storage dialog in a multi-client project only possesses the functions for swapping and setting up the data carrier.

1.1.3.5 Multi-Screen

The multi-client is multi-screen capable without restriction.

1.1.3.6 Behavior of a Server experiencing a Fault

The areas of all server projects are displayed in the overview of the base data picture. Should a server fail, all areas of this server will be deactivated. This does not change the order of the areas. Following a successful switchover to the redundant server, the areas are again displayed as operational.

The configuration of Life Beat Monitoring in the server projects is performed as in WinCC V4.02. In addition to the OS and AS, multi-clients can also be monitored. No manual configuration of Life Beat Monitoring is possible on the multi-client itself. Instead, all server projects - whose packages have been loaded onto the multi-client - are displayed in the system picture of Life Beat Monitoring. Should one OS or AS monitored by the server project fail, the system picture of the multi-client will display this failure in the usual manner. By clicking on the OS icon of the respective server project, a picture change to the system picture of the server project is performed. The failed OS/AS can be viewed there.

If an overall overview picture is opened on the multi-client and the associated server fails, the pictures transmitted by the failed server will be blacked out. After switching to the standby server, they will be displayed again. The switchover procedure runs automatically.

1.1.4 User Scenario: Example of a Distributed System Configuration

The following illustrates the basic steps required for the configuration of a distributed system in the PCS 7 environment.

1. Create a server project using the Split Screen Wizard and the Alarm Logging Wizard.
2. Configure the picture hierarchy using the Picture Tree Manager.
3. Configure the user authorizations in the User Administrator.
4. Configure the Lifebeat Monitoring function.
5. Generate the packages on the servers.
6. Create a multi-client project using the Split Screen Wizard and select the desired runtime view for the areas.
7. Load the packages.
8. Configure the Life Beat Monitoring functions on the multi-client.
9. Configure the user authorizations in the User Administrator of the multi-client.

2 Overview of the Editors of the Options

The services provided by the WinCC system can be expanded via option packages. In order to utilize the individual option packages gainfully, the "Basic Process Control" option package must be installed.

How to install the optional editors of the process control options:

During the installation of WinCC, select the "User-defined Installation" from the "Setup Type" dialog window. In the "Select Components" dialog, activate the "Options" check-box. On the right side, all existing sub-components will be selected for installation. If you do not want to install one or more sub-components, deactivate its check-box.

Check-Box	Installs the following Modules
Basic Process Control	Base Data, Split Screen Manager, Message Wizard (Alarm Logging Wizard), Signal Outputs via a Signaling Module, Picture Hierarchy (Picture Tree Manager), Group Display, 3D Bar Graph and Lifebeat Monitoring.
Storage	Archive/rearchive (Storage). The archive functions support the automatic swapping of data from the hard drive to long-term data carriers as well as the deletion of data on the hard drive.
Chipcard	Chipcard functionality for the user authorization. If WinCC is installed with the "Chipcard" option, the functionality of the User Administrator expands. The "Chipcard Reader" option adds a "Chipcard" entry with corresponding functions to the menu bar.
Video	Camera OCX. By integrating this module, a window can be created via an OLE Control Object in the Graphics Designer. In this window, a video picture recorded by a video camera is displayed.

After making the selection, click on the "Next" button to continue with the installation.

How to install the S7DOS Communication Driver:

When installing WinCC, click on the "User-Defined" button in the "Setup Type" dialog. After selecting the desired languages for the WinCC system in the "Choose Language" dialog, the "User-Defined Selection" dialog is displayed. In this dialog, select the "Connections" check-box and then click on the "Change" button to open the "Select Sub-Components" dialog. This dialog contains the following check-boxes:

Check-Box	Installs the following Module
S7DOS	Communication driver for the S7 connection. Additional information can be found in the STEP 7 manual. Note: This communication driver is not available under Windows NT.

If you want to install the "S7DOS" communication driver, select this check-box. Click on the "Next" button to continue with the installation.

The WinCC System offers the following Optional Editors:

If you selected all check-boxes in the "Select Sub-Components" dialog, the following additional Editors/Wizards will be available to you in the project navigation window:

Editor	Description
Storage	The storage functions support the automatic swapping of data from the hard drive to long-term data carriers as well as the deletion of data on the hard drive.
Picture Tree Manager	The Picture Tree Manager is used to manage a hierarchy of systems, sub-systems, function names, and Graphics Designer pictures.
Time Synchronization	Time synchronization is a function for systems with Profibus and industrial Ethernet bus systems. In this case, a WinCC OS - as the active time master - is responsible for synchronizing all other operator stations and PLCs on the system bus with the current time. The current system bus time is used as the time slave for synchronizing the internal clock.
Lifebeat Monitoring	Lifebeat Monitoring is used to constantly monitor the individual systems (OS and AS), to visualize the results in runtime screen displays, to automatically trigger the signaling module and to generate the process control system messages.
Base Data	Configuration of the WinCC base data by means of Wizards.
Split Screen Wizard	The Split Screen Wizard is part of the Split Screen Manager and is used to configure and initialize the monitor and picture settings for the current WinCC project. The initialization should be performed immediately after creating a project, since other applications (runtime, group displays, etc.) access this data.
Alarm Logging Wizard	The Alarm Logging Wizard is used to configure and initialize the message windows, messages, message classes and systems of the process control messages as well as the signal output via a signaling module for the current WinCC project.

Note:

As an additional WinCC expansion, the optional SFC (sequential function chart) editor can be purchased separately. Refer to the "SIEMENS Ordering Information Catalog ST 80" for information on optional components available for WinCC. The SFC is a control-flow-oriented sequential controller that is used to control processes.

A sequential controller is a controller with a mandatory step-by-step sequence that switches from one state to the next depending on conditions.

2.1 Optional Editor "Storage"



General Information on the "Storage" Editor:

The optional Storage editor supports the automatic swapping of data from the hard drive to long-term data carriers as well as the deletion of data on the hard drive.

The automatic swapping can be controlled via two factors:

- Time-controlled archiving triggered by a specified date or time
- Fill level-controlled archiving triggered by the fill level of the storage medium

If the data is stored in continuous archives, you can use the Storage functions to edit the following data types in the WinCC database:

- Alarms from "Alarm Logging"
- Measured values from "Tag Logging"
- Reports from the "Report Designer"

Note:

You can not use the Storage function to edit data that is stored in cyclic archives!

2.2 Optional Editor "Picture Tree Manager"



General Information on the "Picture Tree Manager" Editor:

The Picture Tree Manager is used to manage a hierarchy of systems, subsystems, function names and Graphics Designer pictures.

All processes and changes made in the Picture Tree Manager relate to the current WinCC project.

You can carry out the following activities with the Picture Tree Manager:

- Create and edit the hierarchy of a project with the Picture Tree Manager editor (CS)
- Support the definition of systems
- Support the assignment of pictures to these systems and create a relationship between the pictures created in Graphics Designer
- Synchronize between the CS and RT components of the Picture Tree Manager as well as the group display and the Picture Tree Navigator
- This synchronization applies to the entire project
- Edit via drag-and-drop
- The Picture Tree Manager has its own Online Help

How to open the Picture Tree Manager:

1. In the project navigation window, double click on the "Editor" project component to view a list of all of the installed editors.
2. Right-click on the "Picture Tree Manager" editor.
3. In the displayed pop-up menu, select the "Open" command.
4. The "Picture Tree Manager" will be started starts and you can edit it.

2.3 Optional Editor "Lifebeat Monitoring"



"Lifebeat Monitoring" is used to monitor automation and operating systems.

"Lifebeat Monitoring"...

- can issue process control messages
- can trigger the signaling module
- has its own Online Help

How to open Lifebeat Monitoring:

1. In the project navigation window, right-click on the "Lifebeat Monitoring" editor.
2. In the displayed pop-up menu, select the "Open" command.
3. Lifebeat Monitoring will be started and you can initialize it.

2.4 Optional Editor "Base Data"



General Information on the "Base Data" Editor:

This editor includes the Split Screen Wizard and the Alarm Logging Wizard, which are required to configure and initialize the base data of a WinCC project. After generating a new project, run the Split Screen Wizard first and then the Alarm Logging Wizard. This also applies to existing projects, after a version upgrade of WinCC has been performed.

Note:

The Wizards must not be started while a project is active.

2.4.1 Optional Editor "Split Screen Wizard"



The Task of the Split Screen Wizard:

The Split Screen Wizard is a component of the Split Screen Manager.

The Wizard is used to configure and initialize the monitor and picture settings for the current WinCC project.

By default, running the Split Screen Wizard will ready the user interface for PCS 7. This also includes the automatic parameterization of the start picture. To fully utilize the Basic Process Control's functionality for PCS 7, no other start picture should be specified manually.

The initialization should be performed immediately after creating a project, since other applications (runtime, group displays, etc.) access this data.

2.4.2 Optional Editor "Alarm Logging Wizard"



The Alarm Logging Wizard is used to configure and initialize message windows, messages, message classes and the signaling module tags for the current WinCC project.

Within the Wizard, settings can be made on several pages. After completing all pages of the Wizard, the generation process is started. In this case, the Wizard generates the data for the application in the PCS 7 environment - this data must not be deleted manually.

2.5 Optional Editor "Time Synchronization"



General Information on the "Time Synchronization" Editor:

Time synchronization is a function for systems with Profibus and industrial Ethernet bus systems. In this case, a WinCC OS - as the active time master - is responsible for synchronizing all other operator stations and PLCs on the system bus with the current time. The current system bus time is used as the time slave for synchronizing the internal clock.

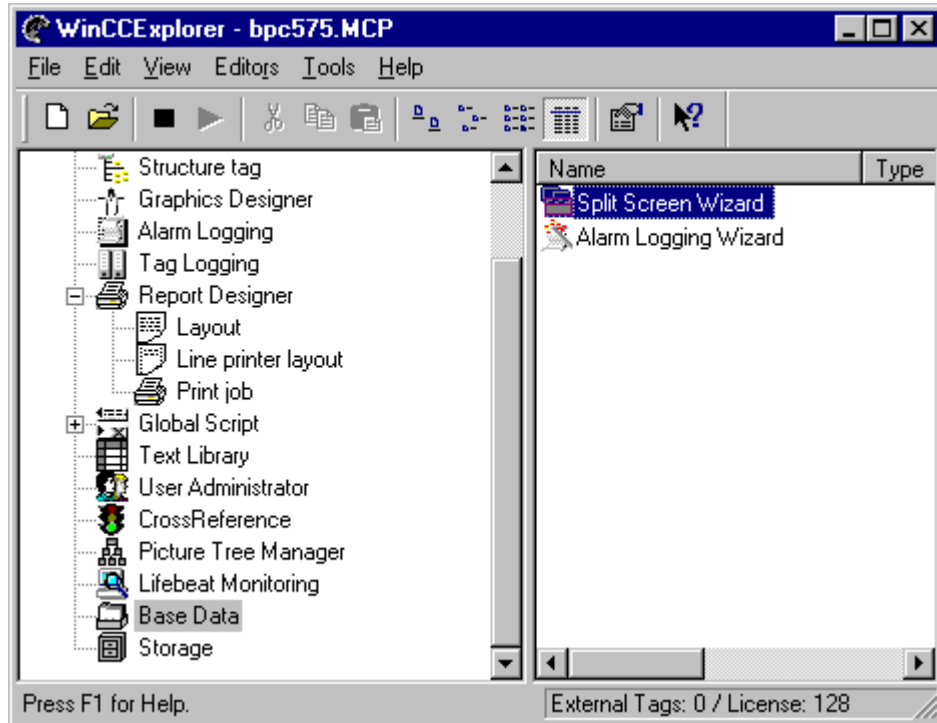
"Time Synchronization"...

- allows for the chronological assignment of messages throughout the system
- synchronizes all operator stations and PLCs on the system bus with the current time
- has its own Online Help

3 Split Screen Wizard

3.1 Using the Split Screen Wizard

The Split Screen Wizard is activated from the "Base Data" folder located in the WinCC Explorer.



With the assistance of this Wizard, the monitor and display settings for the current WinCC project are configured and initialized.

The use of the Split Screen Wizard before the activation of runtime is mandatory, since the Split Screen runtime is based on data loaded by the Wizard.

The Wizard differs in appearance, depending on whether it is being run for the first time or has already been run before.

- If the Wizard is run for the first, the presettings will be determined by means of the current computer configuration.
- If the Wizard has already been run before, these values are supplied as presettings in the dialogs of the Wizard.

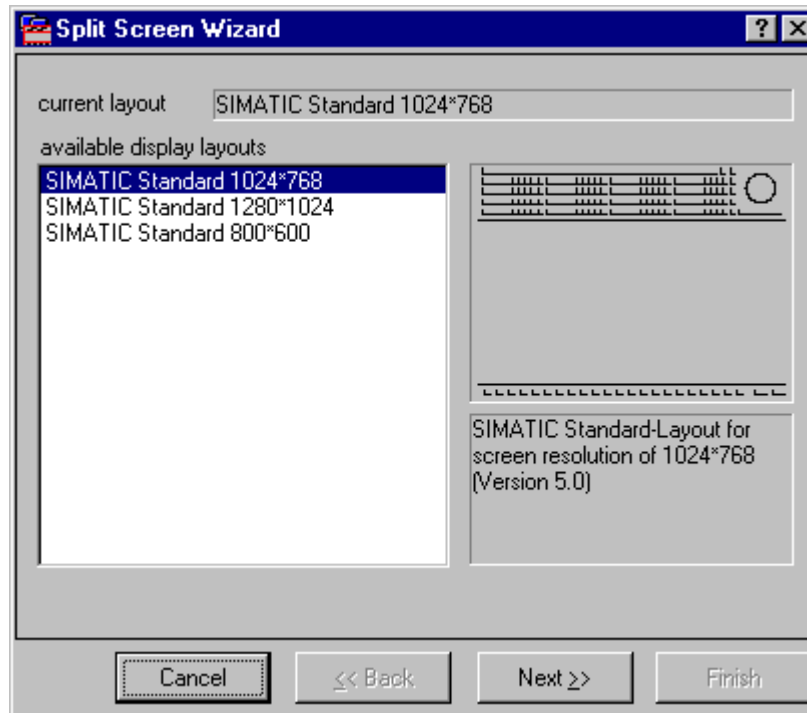
Note:

If an additional client computer is added to a client-server system, the Split Screen Wizard needs to be run again on the server in order for the base data to be updated on all project computers. The settings for the multi-VGA monitor configuration must be uniform throughout the project.

All changes made will only become effective, if the Wizard concludes without any error message.

3.2 Display Resolution

On the first page of the Wizard, the desired display resolution for the runtime target device is specified.



If the Split Screen Manager already possesses initialized data for the display resolution, this data will be used for the presetting.

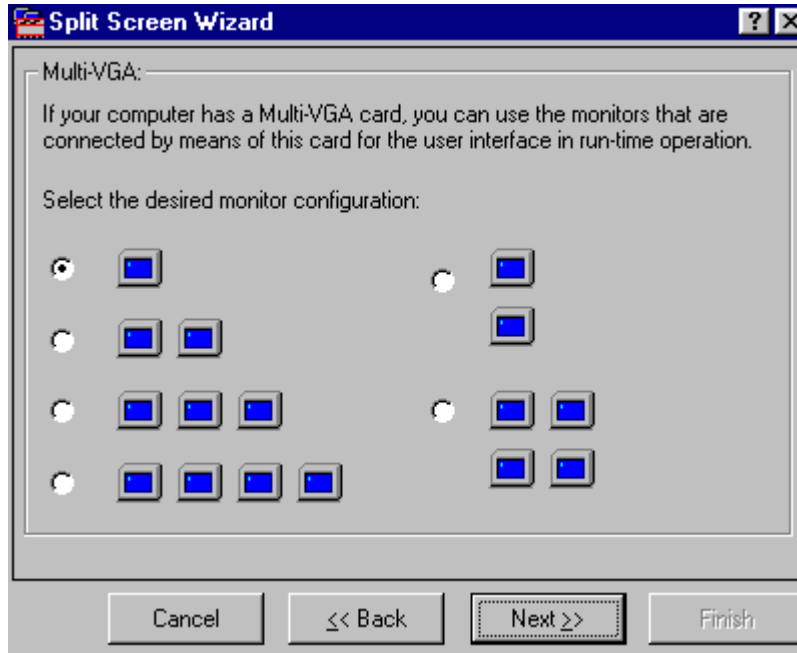
If no initialization data is present, the Wizard will determine the display resolution of the current monitor. The Wizard will then check whether the determined resolution is a whole number multiple of the permitted monitor resolutions. If yes, this monitor setting is displayed in the dialog. If not, the default resolution 800 * 600 is selected.

You are not limited to these default settings. You can configure any display layout and afterwards select one of the provided display layouts from the layout window of the Split Screen Manager. The setting can be made independent of the current resolution. This means that you are able to specify the runtime settings for the displays from any computer.

A display arrangement of four monitors in series can be run at a maximum display resolution of 1024 * 768.

3.3 Multi-VGA

On the second page of the Wizard, the desired display arrangement for the runtime target device is set.



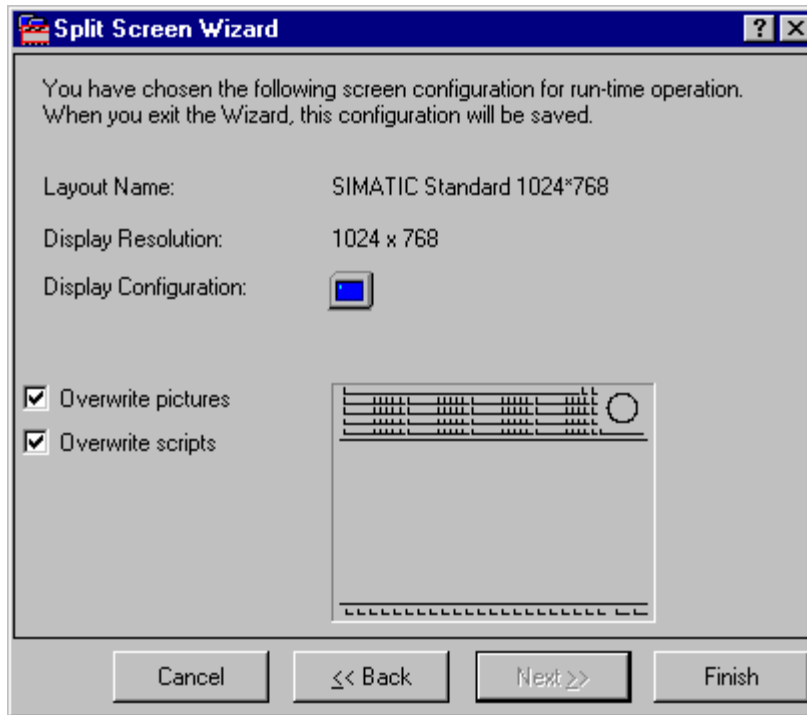
If the Split Screen Manager already possesses initialized data for the display resolution, this data will be used for the presetting.

If no initialization data is present, the presetting "One Monitor" will be used.

You are not limited to these default settings and may choose a setting independent of the current display. This means that you are able to specify the settings for the runtime display arrangement from any computer.

3.4 Control of the Selection

On the third page of the Wizard, the creation of the configuration files is carried out.

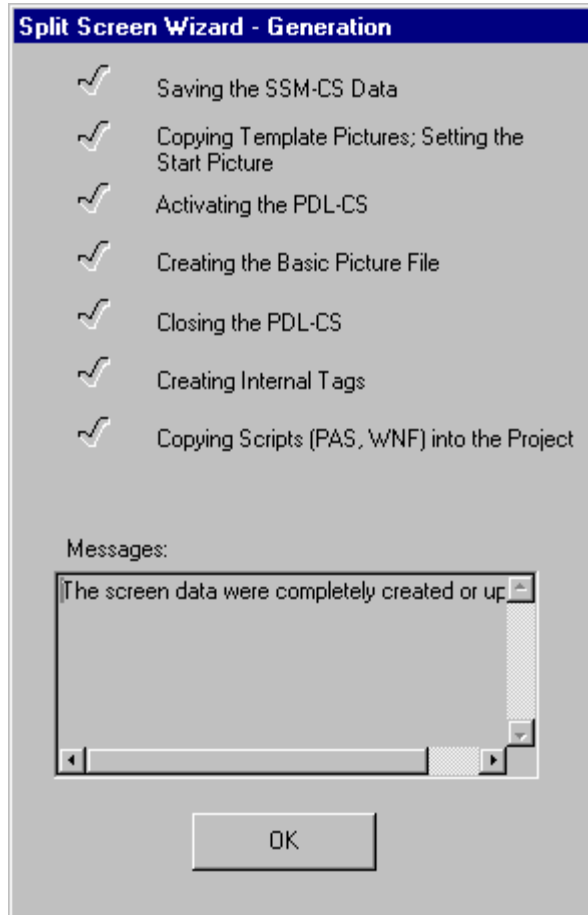


If the Wizard has already been run once, use the check-boxes "Overwrite Pictures" and "Overwrite Scripts" to determine whether pictures and scripts are to be generated again. If you have manually edited pictures or scripts, deactivate the check-boxes, otherwise the pictures or scripts will be regenerated.

By selecting the "Finish" button, the system will be configured with the set values.

3.5 Creation of the Configuration

While the Split Screen Wizard is carrying out the configuration, the following "Generation" dialog will be displayed:



Each successfully performed step will be check-marked. If a step does not need to be performed because the configuration settings were unchanged, that step will also be check-marked.

In the case of an error, the check-mark will be replaced by a red exclamation mark and the generation process be terminated. The "Messages" field will provide a more detailed description of the error and the "Cancel" button instead of the "OK" button will be displayed.

3.6 Configuration of the Runtime Start Picture

The Split Screen Wizard will set up a start picture for runtime. The appearance of this start picture is defined in the @Screen.PDL file. In the Graphics Designer, the @Screen.PDL file can be preconfigured project-specifically.

The runtime display is divided into overview, work and button areas. The work area is required for runtime, whereas the overview and button areas are optional.

- For the overview and button areas, several preconfigured PDL graphic files are available, e.g. @Overview1.PDL for the overview area. Instead of these preconfigured PDL graphic files, other PDL graphic files can also be used for the overview and button areas.
- The work area contains the PDL graphic file @1001.PDL. It already includes all the elements needed for runtime, e.g. @Login.PDL for logging on and @Top01.PDL for the lowest page 0.

The three areas of the @Screen.PDL can be sized and moved in the Graphics Designer - the overview and button areas can also be omitted completely.

3.7 Picture Management in the activated Project

In an activated project, the Split Screen Manager manages the display data and the picture compositions as well as the picture changes according to the picture hierarchy. The individual display areas can be addressed and retrieved using the API functions of the Split Screen Manager. You can also perform a language switch to a language that has been set up in the Text Library.

The Split Screen Manager runs in the background of the active project and cannot be accessed from the user interface.

Note:

The Split Screen Manager is a WinCC option and will only be available, if the option package "Basic Process Control" has been selected during the installation.

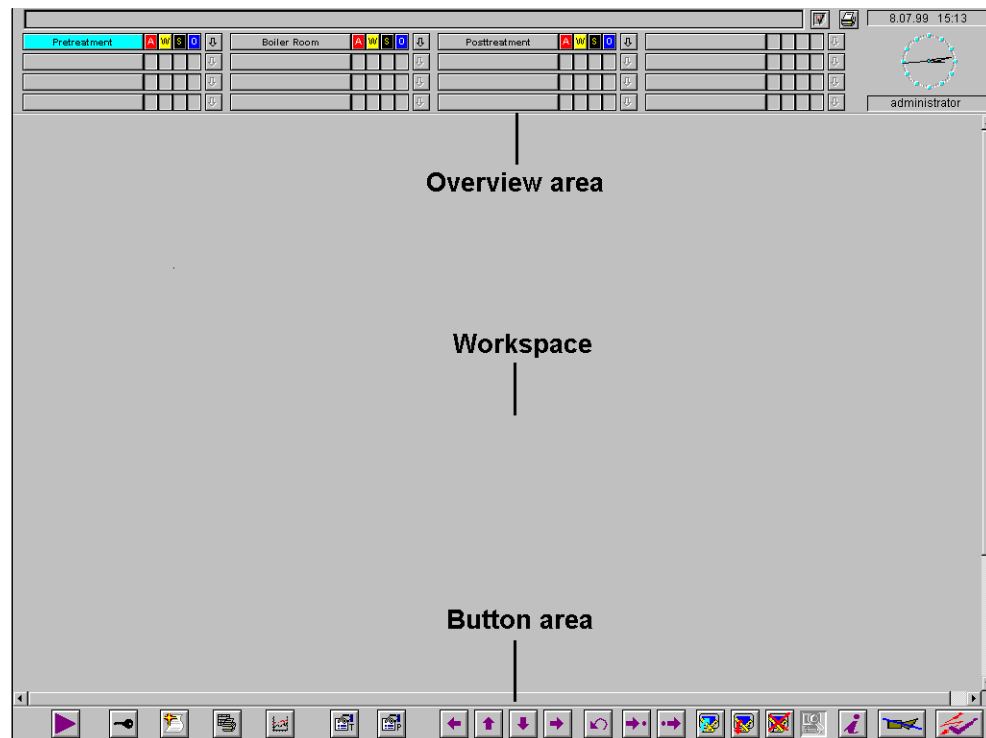
The Split Screen Manager's most important features include:

- Management of the display data and picture changes
- Storing of the picture composition
- Management of the system association of all displayed pictures
- Support of the picture changes according to the picture hierarchy set in the configuration system of the Picture Tree Manager
- Management of a picture change memory (Picture Memory)
- Management of a picture storage (Picture Storage)

The functions of the Split Screen Manager are only available in an activated WinCC project. From the WinCC Explorer, a WinCC project can be activated via the "Activate" icon on the toolbar or the "File / Activate" menus. After the activation, the basic picture of the Split Screen Managers will be displayed. The upper portion of the basic picture contains buttons that are used to access the WinCC pictures of the current project.

The Split Screen Manager manages the display areas of all connected monitors from a basic picture. The structure of the basic picture can be defined with the Split Screen Wizard.

The basic picture is divided into three areas.



With the SHIFT+F5 function button, the overview area of the basic picture is refreshed.

Note:

All settings made in the Split Screen Manager relate to the current WinCC project and the selected computer. Make sure that the runtime applications Alarm Logging, Text Library and Global Script have been checked in the startup list.

If you have added your own Dynamic Wizard scripts, they will initially not be available after running the Split Screen Wizard. You have to re-read your own Wizard scripts manually after the Split Screen Wizard has finished. For this purpose, use the "DynWizEdit.EXE" program located in the .../Siemens/WinCC/BIN folder.

3.7.1 Management of the Display Data and the Picture Changes

The Split Screen Manager supports a maximum of four monitors that each can have a workspace, a button area, a maximum of eight process windows (Top Windows) and any number of preconfigured fields with permanently assigned pictures (Special Fields).

The individual display areas can be addressed and retrieved using the API functions of the Split Screen Manager.

3.7.2 Management of the System Association

Every picture change is carried out by the runtime of the Split Screen Manager. As a result, the Split Screen Manager runtime can provide information about the association of the currently displayed pictures to the system at any time (system hierarchy). This information is required for the system-specific user authorization check and can be addressed and retrieved with the help of Global Script standard functions and appropriate Split Screen Manager API functions.

3.7.3 Picture Change according to the Picture Hierarchy

Prerequisite for this function is an existing system picture hierarchy that has been created with the help of the Picture Tree Manager. Picture changes can be executed directly via the Split Screen Manager runtime. For this purpose, the API functions of the Split Screen Manager have to be employed. The runtime of the Split Screen Manager together with the runtime of the Graphics Designer will then perform the picture change according to the configured picture hierarchy.

3.7.4 Management of the Picture Change Memory

The Split Screen Manager logs every picture change of the work area and allows you to go back to a previously displayed picture. For each work area of the basic picture a separate picture change memory is kept in which the last eight selected picture names are stored.



The previous picture is selected using the button shown

Note:

The authorizations to the pictures in the picture change memory are user-specific.

Consequently, the picture change memory of all displays is deleted every time the WinCC user changes.

The content of the picture change memory can be retrieved using Split Screen Manager API functions.

3.7.5 Management of the Picture Storage

In the Split Screen Manager, every work area of the basic picture has its own picture storage (clipboard). The picture storage makes retaining a picture from the work area easy. Such a picture can then be retrieved at any time (even more than once). Storing a new picture will overwrite the previous picture in the picture storage. A separate picture storage is kept for each work area of the basic picture.



Storing and retrieving a picture of the picture storage is performed using the buttons shown

Note:

The authorizations to the pictures in the picture storage are user-specific.

Consequently, the picture storage of all displays is deleted every time the WinCC user changes.

The content of the picture storage can be retrieved, changed or deleted using Split Screen Manager API functions.

3.7.6 Notes about Multi-VGA Operation (Split Screen Manager)

Invisible Parts of Application Windows

Due to Windows NT properties, application windows must have a certain size in order for all window contents to be visible. This, for example, concerns windows that are divided or that contain additional output fields in the status bar. Depending on the set display resolution and the number of screen (size of the desktop), a window might have to exceed the width of a monitor in order for all window parts to be displayed.

The runtime interface is not affected by this.

Displaying Dialog and Application Windows, Message Boxes and other Objects

Since different multi-VGA graphic cards under Windows NT behave differently with respect to displaying objects (e.g. dialog and application windows, message boxes), it can happen that an object / window to be opened:

- is always displayed on monitor 1 (preferred monitor)
- is placed across several monitors
- is displayed on the monitor on which the mouse operation took place

The runtime interface is affected by this as well.

3.8 The Loop in Alarm Function

Via the "Loop in Alarm" function, a picture of the associated measuring point can be opened if an alarm is reported. For the configuration of the "Loop in Alarm", open the Alarm Logging editor. The "Loop in Alarm" function can be found in the "Tag/Action" tab of the properties dialog of the individual messages. As the standard function, "Open Picture" has been set.

Note:

The standard function "Open Picture" must not be used in the PCS 7 environment since a picture called by this function would cover the entire runtime interface making additional inputs impossible.

For the "Loop in Alarm" function, the PCS 7 system provides the following modes of opening pictures

1. Opening a measuring point picture as the process window by indicating an instance name of a measuring point, the corresponding function is named:
 - "LoopInAlarm"
2. Opening a measuring point picture in the work area by indicating a picture name, the corresponding function is named:
 - "SSMChangeWorkField"
3. Opening a measuring point picture as the top window by indicating a picture name, the corresponding function is named:
 - "SSMOpenTopField"

For option 1, note that the standard function sets the instance name of the measuring point as the calling parameter. In the PCS 7 system, this task is carried out by the mapper. A selection of the calling parameters via the function browser is not possible.

To open a picture with the standard function "SSMChangeWorkField" or "SSMOpenTopField", a new standard function (e.g. "MyOwnLoopInAlarm") must first be created with the Global Script editor. In this new standard function, the required call parameter (e.g. the picture name) must be set. In this function, only one parameter can be transferred. Afterwards, within the new function, one of the above-mentioned standard functions for opening a picture can be called and supplied with the needed parameters. Do not change the standard functions "SSMChangeWorkField" and "SSMOpenTopField". The newly created standard function can be integrated as a Loop-in-Alarm in Alarm Logging by opening the function browser via the "..." button (to the right of the "Function Name" field). In the folder "Standard Functions"/ "Split Screen Manager", the above-mentioned function can be selected.

In the "Picture Name/Call Parameter" field, select the name of the picture to be opened.

To call the "Loop in Alarm" function in runtime, select the respective message from the message list and click on the "Loop in Alarm" button.

4 The Alarm Logging Wizard

The Alarm Logging Wizard offers a simple way to configure the message system in accordance with the rules for process control systems. This wizard is accessed in the project navigation window of the WinCC Explorer via the branch "Base Data".

The following data and data structures are created:

Message attributes:

Message classes (acknowledgment method, horn, names for different states, etc.) and message types (colors for different states, etc.)

Message window attributes:

Properties of the toolbar, properties of the status bar, filter properties, column sequence, column width

Archives:

Sequence archive or continuous archive

You can make settings for the following subjects in the windows of the "Alarm Logging Wizard":

- Setting up the Message Window
- Activating Process Control System Messages
- Assigning the Output Channels
- Overview of the Message Classes

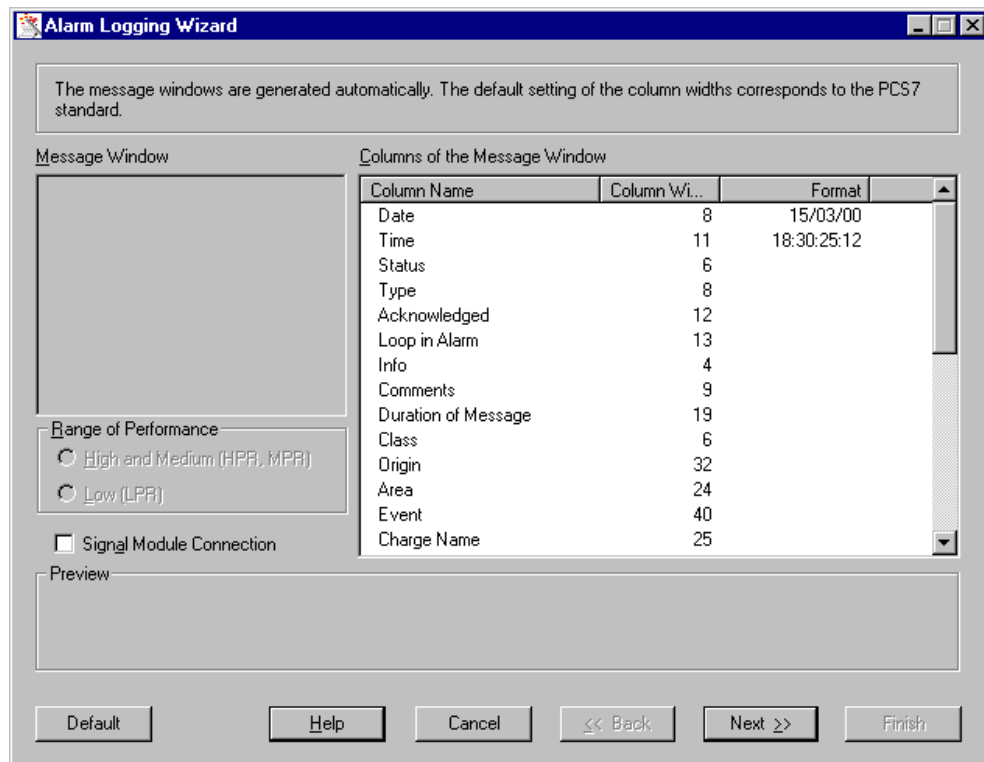
The Alarm Logging Wizard is provided for process control systems and creates a series of message classes and the required message classes according to the specifications for process control system messages. Existing message classes are overwritten during this process. If you insert your own message classes in the Alarm Logging editor, these are also overwritten the next time the Alarm Logging Wizard is started as these message classes do not meet the specifications for process control system messages. In order to configure additional messages, create your own message classes, which are unknown to the wizard, after running the Alarm Logging Wizard at least once. The Alarm Logging Wizard can read in and apply these additional message classes on the next start.

Note

The Alarm Logging editor also has a wizard of its own. This wizard has nothing to do with the Alarm Logging Wizard of the process control options and must, therefore, be considered separately. Do not confuse the two wizards.

The function "Central Signaling Device Connection" can be activated in the Alarm Logging Editor via the dialog "Single Messages" in the tab "Parameters". This function has, however, nothing to do with the function "Signal Module Connection" in the Alarm Logging Wizard of the LT-options.

4.1 Setting Up the Message Windows



On the first dialog-box page, you can specify how the columns are to be divided in the message window.

Signal Module Connection

Use the control box "Signal Module Connection" to specify whether WinCC should make messages available for the signal module. The signal module PC expansion card outputs electrical signals for optical and acoustic output of WinCC messages.

If the control box "Signal Module Connection" has been activated, an additional page appears in the Alarm Logging Wizard dialog box for setting the signal module.

The settings which you have selected in the Alarm Logging Wizard for the signal module are displayed the next time the Alarm Logging Wizard is run.

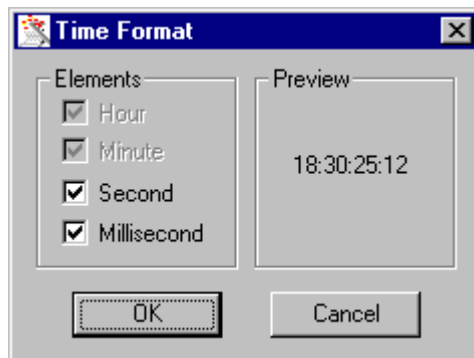
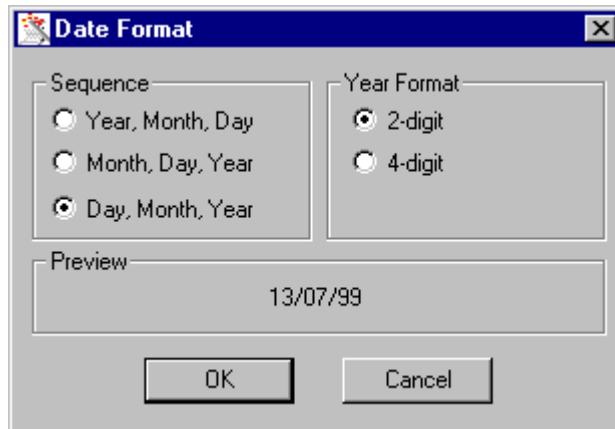
Note

Information regarding the installation and wiring can be found in the Chapter "Signal Module".

Message Window Columns

All message windows are provided with presettings for setting up the columns. These presettings can be viewed in the window "Message Window Columns".

Click the right mouse button on the columns "Date" and "Time" to open a dialog in which the output format can be changed. The column width is automatically changed according to the format you select.

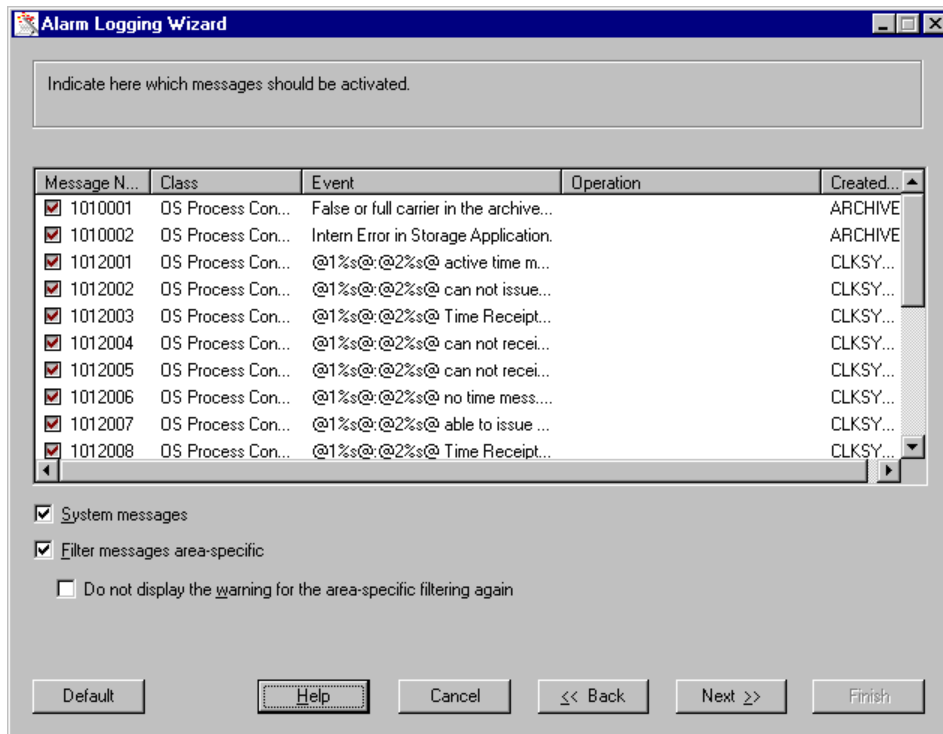


For the remaining columns, you can set the column width by right-clicking on the column element and specifying a column width (max. width: 80 characters).

Note

You cannot change the order of the columns.

4.2 Activating Process Control System Messages



Use this dialog to enable or disable individual **process control system messages**. A control box displays the status of the messages.

Use the control box "System Messages" to incorporate predefined messages in the system. These messages are imported into the alarm system upon activation of the control box.

Via the check-box "Area-specific filtering of messages", messages in runtime can be filtered according to the user authorizations set in the User Administrator. If the check-box is activated, the messages will be filtered user-specifically. Only those messages will be displayed that have been assigned to a system area by Alarm Logging. If the control box is deactivated, all messages are displayed.

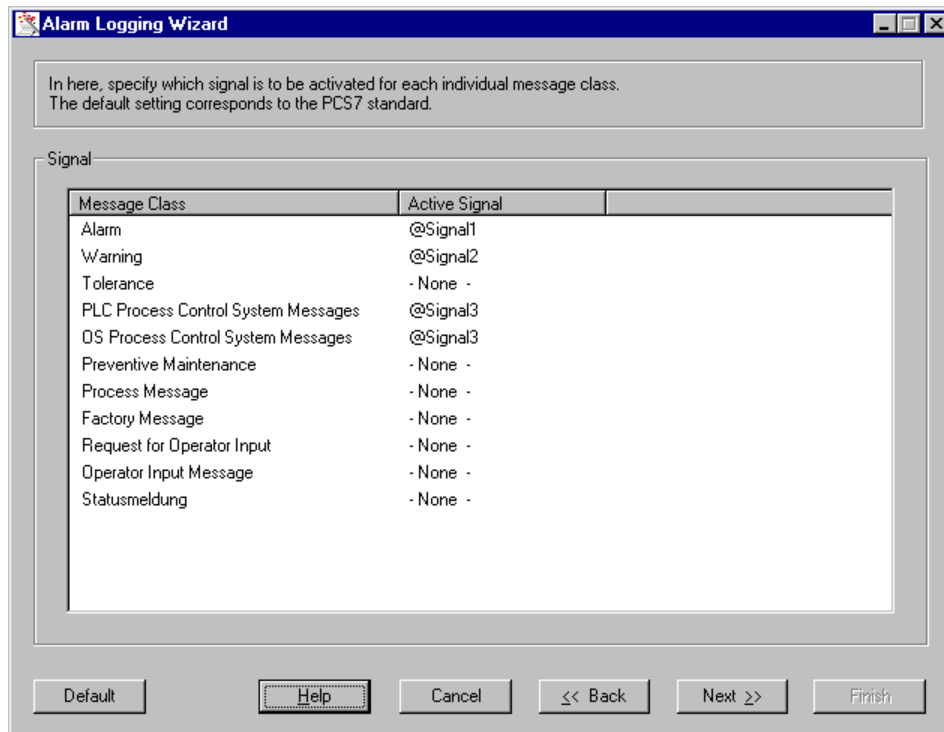
Use the control box "Do not display the warning for the area-specific filtering again" to activate or deactivate the following dialog:



Note

In normal cases, all process control messages should be activated so that the maintenance personnel is informed in the event of a control system malfunction.

4.3 Assigning the Output Channels



If you activated the control box "Signal Module Connection" on the first page of the Alarm Logging Wizard, this page is displayed for assigning the output channels. When assigning the output channels, set the channel on which a signal is to be triggered for the individual message classes. There are three output channels available for each message class.

The following output channels are automatically assigned by the Alarm Logging Wizard:

Alarm	@Signal1
Warning	@Signal2
PLC Process Control Messages	@Signal3
OS Process Control Messages	@Signal3

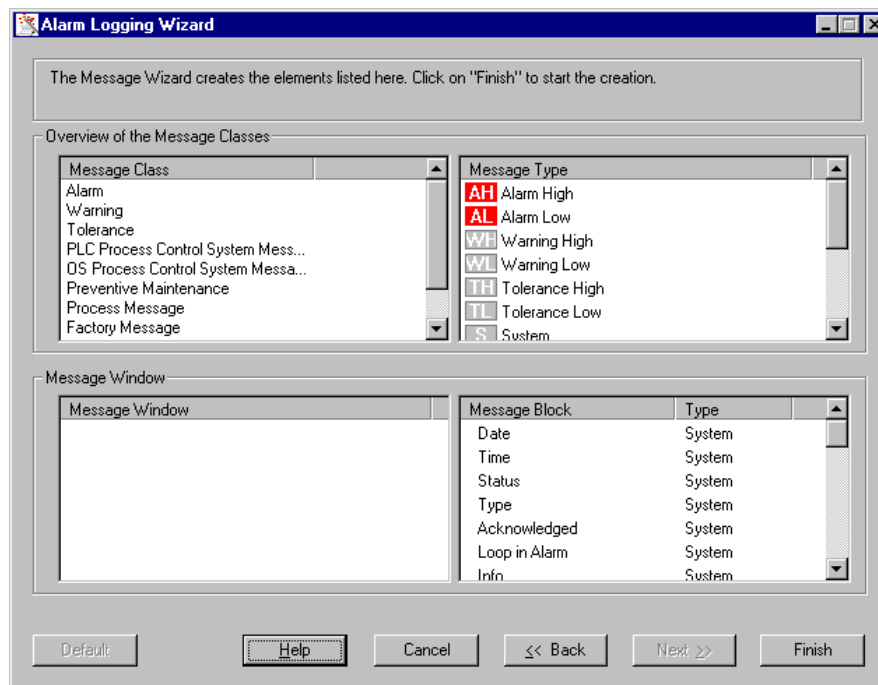
To assign additional output channels, click the right mouse button in the column "Message Class" on the message class whose output channel you would like to change. Alternatively, you may click directly on the entry. Appearing in the column "Active Signal" is a combination box with the internal tags available for selection "@Signal1, @Signal2 and @Signal3". If the output channel is not assigned, "None" must be selected. In the pop-up window, use the left mouse button to select a new output channel.

Note

The assignment of a signal in the Alarm Logging Wizard refers only to the optional signal module and can only be changed via this wizard. As a result of this assignment, one of the three signal outputs is set to the signal module.

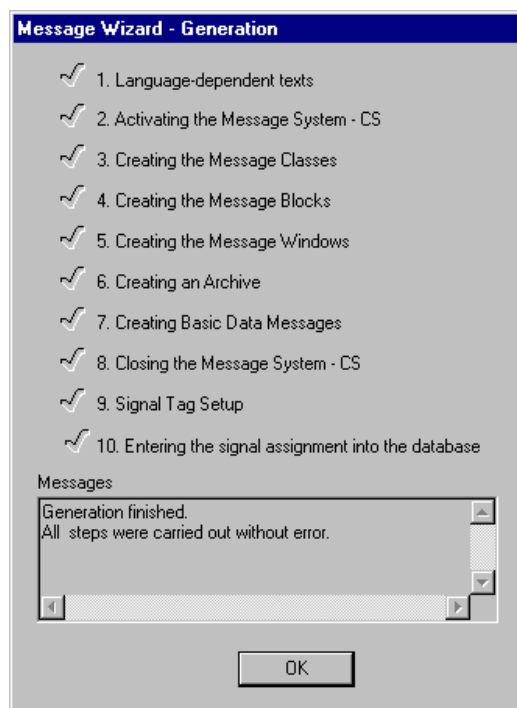
The message parameter "Central Signaling Device Connection" during the configuration of single messages in the Alarm Logging Editor refers to the setting of a central signaling device via a tag and is to be considered completely separately.

4.4 Overview of the Message Classes



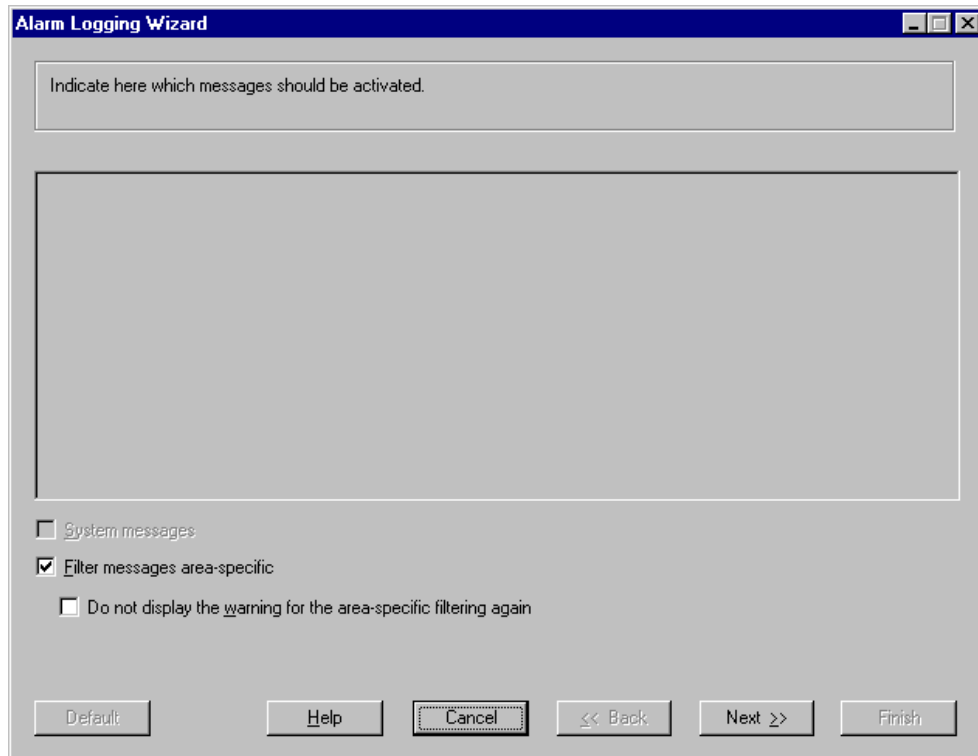
The elements created by the "Alarm Logging Wizard" are displayed here. This gives you an overview of the structure to be created.

Click "Finish" to start generating the message system. The generation process is displayed in the window "Message Window - Generation":

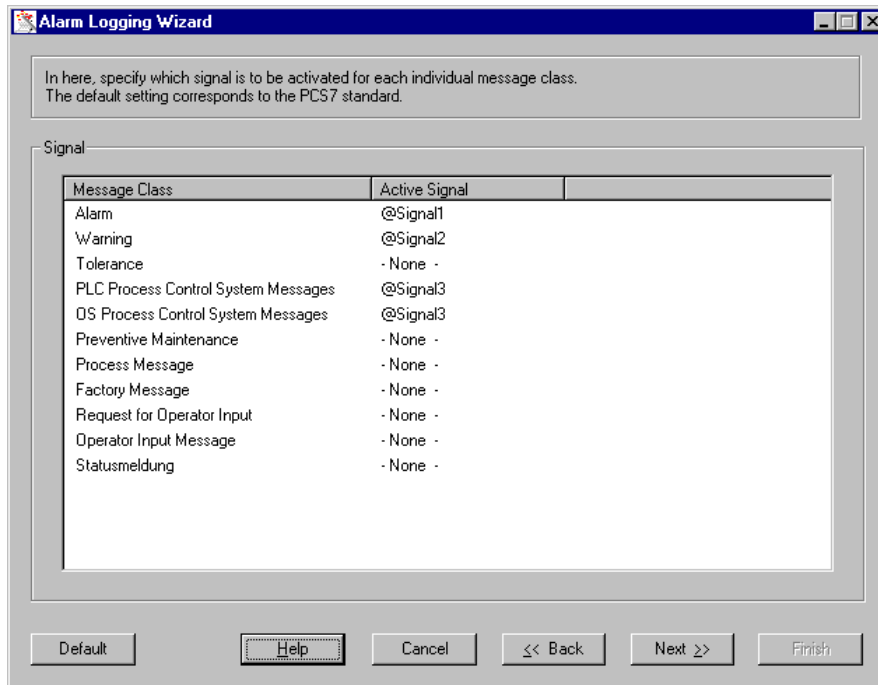


4.5 The Alarm Logging Wizard in a Multi-Client Project

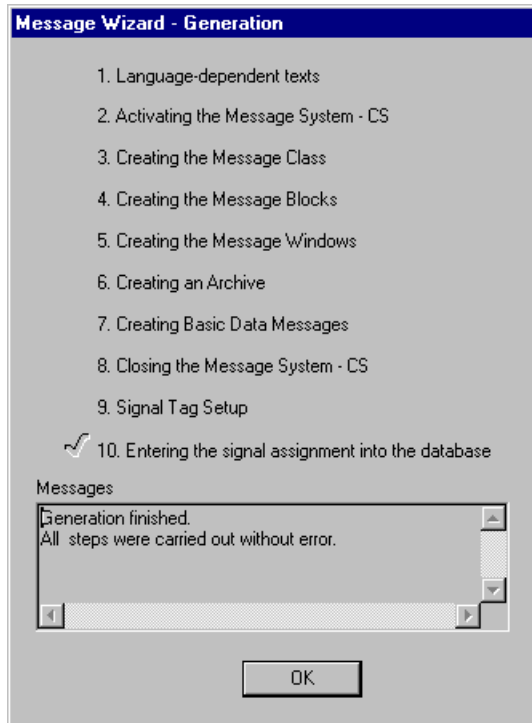
Alarm configuration can only be performed in a server project. Message controls are configured in the Graphics Designer to display messages pending for the server on the multi-client. The Alarm Logging Wizard in a multi-client project performs the message assignment and the message filtering. System messages cannot be selected as they are carried out via the Alarm Logging Wizard in a server project.



The descriptions of the control box "Filter messages area-specific" and "Do not display the warning for the area-specific filtering again" correspond to those for the Alarm Logging Wizard in a server project.



When the Message Wizard in a multi-client project has finished, the "Message Wizard - Generation" dialog is displayed. Upon completion, the signal assignment in the database is performed.



5 Picture Tree Manager

Installation Note: The Picture Tree Manager is a WinCC option and is only available to you if you selected the option package "Basic Process Control" during installation.

The Picture Tree Manager is used to manage a hierarchy of systems, subsystems and pictures contained in the Graphics Designer and makes available the following functions:

- Create and change a project's hierarchy.
- Support during the definition of systems and subsystems.
- Supports the assignment of pictures to the system and creates an order between the pictures that are created in Graphics Designer.
- In Runtime, picture selection by means of navigation through the hierarchy tree is supported.

Note

When creating new WinCC projects, a picture hierarchy should be created and saved as well with the Picture Tree Manager.

All procedures and changes, that you undertake in the Picture Tree Manager affect the current WinCC project.

Actions that cross projects (copying/moving pictures and systems across multiple projects) are not possible.

On switching the language in the WinCC Explorer the language in the opened Picture Tree Manager is switched too. The container names are only switched to the newly set language after starting the Picture Tree Manager.

It is not possible to configure the picture hierarchy on the multi-client. Instead, an overview of all hierarchies of all server projects imported as packages is presented in runtime.

Tag Processing by the Picture Tree Manager

For each picture containing a group display, the Picture Tree Manager stores tags named @<PictureName> in the "Group Signals" tag group.

Example: For the picture "PTM.pdl", a tag named @PTM is created.

"Group Signals" Tag Group

If the option Completely recalculate the group display hierarchy when saving is activated, all tags in this group will be deleted and then recreated. Because of this, no tag must be configured within the "Group Signals" tag group.

Possible Name Conflicts

The Picture Tree Manager creates tags named @<PictureName>. In Lifebeat Monitoring, a tag named @<DeviceName> is created for each device name. This may cause conflicts due to identical names. To avoid identical tag names, the picture name must not be identical to the device name or system tags with the name prefix @.

Should this nevertheless occur, a corresponding message will be output.

In the log file "PictureTreeManagerCS.log", the tag names causing a name conflict will be listed. By changing the picture name, the name conflict can be resolved. Picture names cannot be changed in the Picture Tree Manager. Picture names have to be renamed in the WinCC Explorer. Afterwards, the changed picture has to be inserted into the hierarchy.

5.1 Structure

The user interface of the Picture Tree Managers contains:

- a menu bar
- the standard toolbar
- a data window with three areas
- a status bar

5.1.1 Menu Bar

In the menu bar, all the commands of the Picture Tree Manager are divided into groups and assigned to menus. To execute a command, open the corresponding menu, click on the command, and, if applicable, set the desired parameters in the displayed dialog box. All commands are available from the menus:

Menu Project

Save
Print Project Documentation Hierarchy
View Project Documentation Hierarchy
Setup Project Documentation Hierarchy...
Print Project Documentation Group Display
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Exit

Edit Menu

Edit Picture
Edit Container Name
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View Menu

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Menu Options

Confirm For Replace Pictures
 Confirm For Delete Hierarchy
 Calculating the Group Display Hierarchy Over Again While Saving

Help Menu

Contents and Index
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5.1.1.1 Project Menu**Save**

The command "Save" stores the current hierarchy of the containers and pictures. Changes in the hierarchy affect all applications that are registered as RT clients of the Picture Tree Manager (that also includes the group display).

The data will be stored in the database of the project.

Note

All changes made while editing the "Picture Tree Manager" are only temporary. The changes will only be accepted after saving the Picture Tree Manager.
 A few menu functions are disabled during the save operation ("Project" menu). However, the hierarchy can still be edited.

Print Project Documentation Hierarchy

Use the command "Print Project Documentation Hierarchy" to print the hierarchy on the standard printer. The print settings set in "Setup Project Documentation Hierarchy..." apply.

View Project Documentation Hierarchy

Use the command "View Project Documentation Hierarchy" to display a preview of the project documentation for the hierarchy.

Setup Project Documentation Hierarchy...

Use the function "Setup Project Documentation Hierarchy..." to add special settings to a print job when printing the hierarchy tree. The dialog contains three tabs.

Tab	Description
Print Job	General settings for the print job can be set in this tab.
Selection	Settings for the page area as well as the time range for the print data can be set in this tab.
Printer Selection	The output device for the print job can be set in this tab. The print job can also be directed to a file.

The appropriate system layout from the Report Designer is used for the printout.

Print Project Documentation Group Display

Use the command "Print Project Documentation Group Display" to print the group displays on the standard printer. The print settings set in "Setup Project Documentation Group Display" apply.

View Project Documentation Group Display

Use the command "View Project Documentation Group Display" to display a preview of the project documentation for the group display.

Setup Project Documentation Group Display...

Use the function "Setup Project Documentation Group Display" to add special settings to a print job when printing the group displays. The dialog contains three tabs.

Tab	Description
Print Job	General settings for the print job can be set in this tab.
Selection	Settings for the page area as well as the time range for the print data can be set in this tab.
Printer Selection	The output device for the print job can be set in this tab. The print job can also be directed to a file.

The appropriate system layout from the Report Designer is used for the printout.

Exit

Exit the "Picture Tree Manager" via the "Exit" command.

If you have made changes and have not yet saved them, a dialog appears asking if you would like to save the changes.

5.1.1.2 Edit Menu

Edit Picture

Use the command "Edit Picture" to start the "Graphics Designer". The picture can subsequently be edited. This menu item is only enabled if a picture is selected.

Edit Container Name

The command "Edit Container Name" allows you to edit the container description. The name of the root container (WinCC Project Name) cannot be changed.

Note

While in (container) editing mode, the picture name is hidden.

Cut Picture

Use the command "Cut Picture" to copy a selected picture into the clipboard. This command is only enabled if a picture has been selected. The content of the clipboard is stored until it is replaced by a new entry (via the command "Cut" or "Copy"). The picture name remains visible in the container and is enclosed by pointed brackets << PictureName.PDL>>. The picture can then be inserted at another location.

Cut Container

The command "Cut Container" marks a container, including the entire connected subhierarchy and the pictures, and copies it into the clipboard. The command is only enabled if a container has been selected from the hierarchy window. The content of the clipboard remains stored until it is replaced by a new entry (via the command "Cut" or "Copy"). The container remains visible at the cut location until it is inserted at another location.

Copy

Use the command "Copy" to create a copy of the empty container in the selection window and place it in the clipboard. The content of the clipboard will remain stored until it is replaced by a new entry (using the command "Cut" or "Copy"). After copying, the content of the clipboard can be inserted into the hierarchy.

Note

Inserting a new container into an existing node expands the hierarchy by one level. If you insert a container before or after a container, the affected hierarchy level is expanded by one container.

Paste

This command is only available when pictures and/or containers have been placed in the clipboard and are to be copied into the selection window. If the clipboard contains a picture, it is inserted in the selection window with this command. If the clipboard contains a container (with or without subcontainer), this command inserts this container and any pictures contained therein into the selection window. The container name and the structure of the subhierarchy, though, will be lost. You will be notified of possible loss of hierarchy information as a result of this action by means of an info box.

Insert Picture Into Container

The command "Insert Into Container" copies the contents of the clipboard into a selected container. The command is only enabled if the clipboard contains a picture. If the container already contains a picture, it will be replaced by the new picture. Use the option "Confirm For Replace Picture" to change the behavior of the "Picture Tree Manager" (with or without confirmation).

Insert After

The command "Insert After" copies the contents of the clipboard after the selected container. The command is only enabled if a container (not the root-node) has been selected, and one or more containers have been copied into the clipboard.

Note

A container cannot be inserted before or after the root-node.

Insert Before

Use the command "Insert Before" to copy the contents of the clipboard before the selected container. This command is only enabled if a container (not the root-node) has been selected, and one or more containers have been copied into the clipboard.

Note

A container cannot be inserted before the root-node.

Insert Into Node

The command "Insert Into Node" copies the contents of the clipboard into the selected container. Each container in the clipboard is inserted as a new node of an underlying hierarchy level. This command is only enabled if a container (not the root-node) has been selected, and one or more containers have been copied into the clipboard.

New Container

Use the command "New Container" to insert a new container before, after or in the selected node. After inserting the new container, the Picture Tree Manager will assign the name "Container" plus a running number to it (e.g. Container23).

Delete Picture

The command "Delete Picture" removes the selected picture from the hierarchy. The picture will automatically be moved into the selection window. This command is only enabled if a picture has been selected in the hierarchy window.

Note

The picture deleted from the hierarchy can be inserted again at a later time.

Delete Container

The command "Delete Container" removes a selected container from the hierarchy. All pictures contained in the deleted subhierarchy will automatically be moved to the selection window. This command is only enabled, if a container (with or without subcontainers or pictures) has been selected in the hierarchy window.

Properties

The "Properties" menu item of the "Edit" menu displays the properties of a picture.

5.1.1.3 View Menu

Preview

The "Preview" command allows you to turn the picture preview on or off. If the option has been selected, the preview window will automatically display the picture selected from the hierarchy window. If the container does not contain a picture, the preview window remains empty.

Independent of whether this option has been selected or not, the header line of the preview window will always display the name of the picture contained in the container.

If the preview window is resized, the displayed picture will adapt to the new dimensions.

A check mark next to the menu entry indicates that the picture preview has been activated.

Arrange Picture Icons Alphabetically

Use the command "Arrange Picture Icons Alphabetically" to alphabetically sort the pictures in the selection window. This option can not be set permanently.

Arrange Picture Icons Automatically

The command "Arrange Picture Icons Automatically" allows you to turn on the automatic arrangement of the pictures in the selection window.

If the option is activated, the pictures will be arranged automatically. The gaps will automatically be filled.

A check mark next to the menu entry indicates that the automatic picture arrangement has been activated.

5.1.1.4 Menu Options

Confirm for Replace Picture

Use the command "Confirm for Replace Picture" to specify whether the user must acknowledge the replacement of a picture in the hierarchy.

A check mark next to the menu entry indicates that the acknowledgment for replacing pictures has been activated.

Confirm for Delete Hierarchy

Use the command "Confirm for Delete Hierarchy" to specify whether the user must acknowledge the deletion of the hierarchy.

A check mark next to the menu entry indicates that the acknowledgment for replacing pictures has been activated.

Recalculating the Group Display Hierarchy when Saving

If the option "Calculating the Group Display Hierarchy Over Again while Saving" has been activated, the group display hierarchy of all WinCC pictures will be calculated over again every time the Picture Tree Manager is saved. If no group displays are used, this function can be deactivated to allow for a faster saving.

If, during the start-up of runtime, WinCC detects that the group display hierarchy is no longer current, the control system message "The Group Display Hierarchy has not been updated..." will be displayed. If the option "Calculating the Group Display Hierarchy Over Again while Saving" has been activated, then the picture hierarchy of the Picture Tree Manager must be saved again.

5.1.1.5 Help Menu

Contents and Index

The command "Contents and Index" allows you to access the on-line help of the Picture Tree Manager.

For further information about the process, see the Windows NT description.

Using Help

Use the "Using Help" command to obtain information about how to use on-line help.

About Picture Tree Manager








Use the command "About Picture Tree Manager" to obtain additional information about the Picture Tree Manager program and its platform.

5.1.2 Standard Toolbar



The standard toolbar contains icons with which you can carry out common commands.

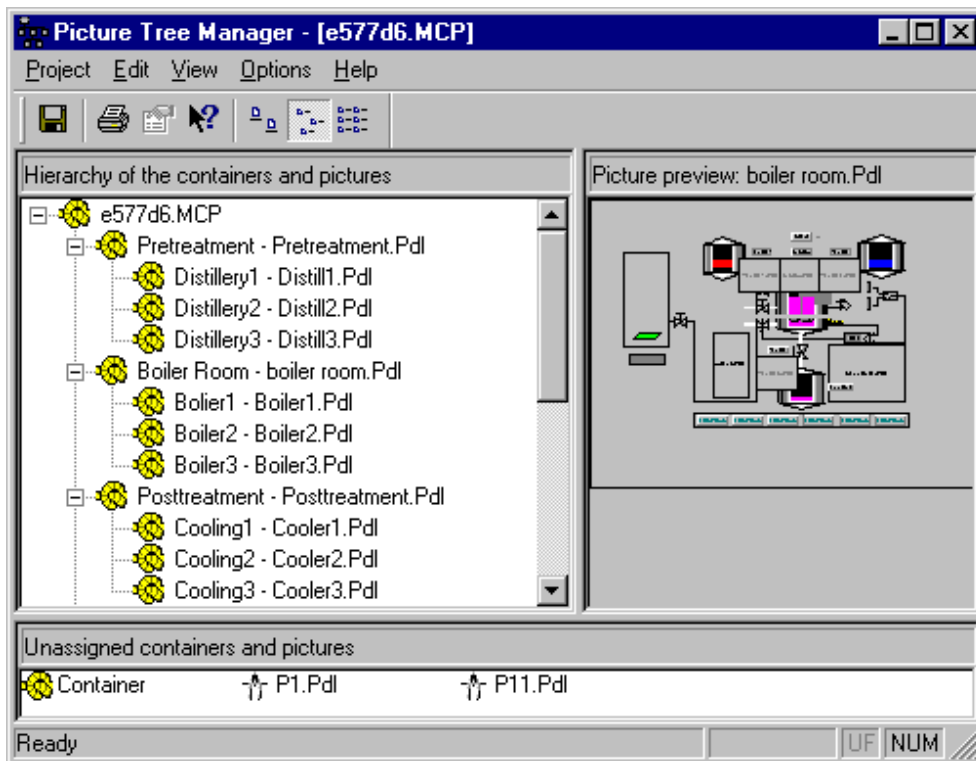
Use the menu command "View / Standard Toolbar" to display or hide the toolbar.

Icon	Description
	"Project" "Save"
	"Project" "Print Project Documentation Hierarchy"
	"Edit" "Properties"
	"Help" "Direct Help"
	"View" "Large Symbols"
	"View" "Small Symbols"
	"View" "List"

5.1.3 Data Window

The data window of the Picture Tree Manager is divided into three areas.

- Displayed in the upper left part of the hierarchy window is the hierarchy of the systems, subsystems and pictures as a tree. The first container (the highest in the hierarchy) has the name of the WinCC project and can neither be moved nor deleted. A container can be empty or, with the exception of the root container, can contain a picture.
- The preview window, located in the upper right, displays the contents of the picture selected in the hierarchy window.
- All pictures available in the WinCC project which have not yet been assigned in the hierarchy, as well as the icon of an empty container, are displayed at the bottom of the selection window. (System pictures that begin with @ are not displayed).



Each area has information about its contents in the title bar.
You can change the size of the individual operating areas with the mouse.

5.1.4 Status Bar

The status bar provides you with the following information:

- Displays an appropriate help text for a selected function.
- Displays the key status (e.g. the Num Lock key).
- Click on the size box to change the window size of the application.

5.2 Working with the Picture Tree Manager

To work with the Picture Tree Manager, start it via the pop-up menu in the WinCC Explorer.

The editor has only one dialog for editing the hierarchy. You can access all of the editing possibilities in this dialog. The most effective way to work with the editor is the drag-and-drop function.

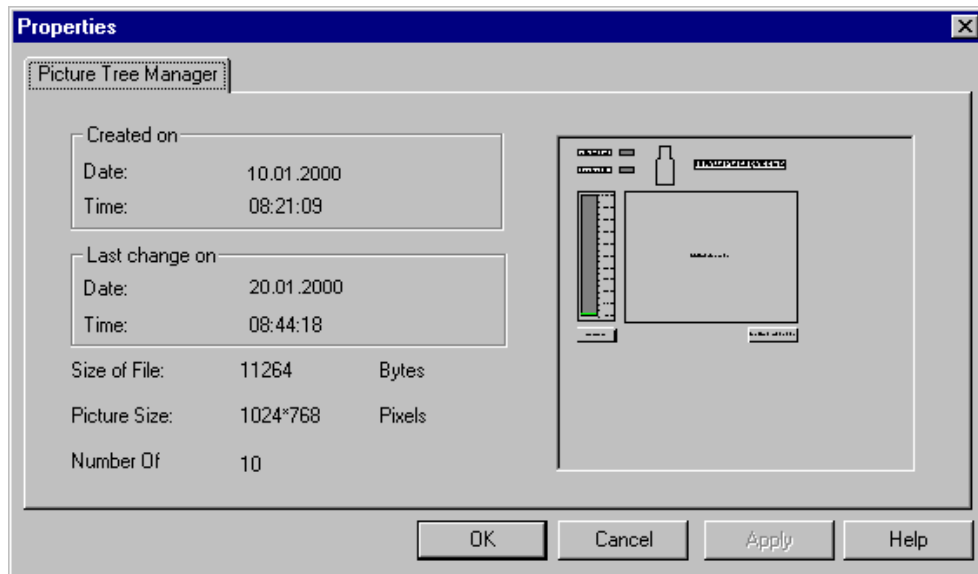
- Use the clipboard and the "Cut," "Copy," and "Paste" functions to create and change the hierarchy.
- You can access editing functions by using the Menu Bar, the pop-up menu, or drag-and-drop.
- Insert the empty container from the selection window to expand the hierarchy by one container.
- Cut and paste a picture from the selection window or move it using drag-and-drop to insert a picture into a container in the hierarchy.
- You can also move subhierarchies (subtrees) within the hierarchy.
- Pictures that you remove from the hierarchy (hierarchy window) are inserted in the selection window automatically.
- Picture properties, such as change date and size of a selected picture, can be displayed.

Note

None of the changes you make while editing take effect until you save.

5.2.1 Display Picture Properties

Information can be called up for each picture, e.g. change date or picture size.



How to Display the Picture Properties:

1. Select the desired picture and open the pop-up menu.
2. Select the "Properties" menu item to display the picture properties,

5.2.2 Using a Drag-and-Drop Operation to Insert New Containers

You can use drag-and-drop to insert new containers in the hierarchy window. The Picture Tree Manager supports drag-and-drop with the left as well as the right mouse button (drag-and-drop with the pop-up menu). This is possible in the hierarchy window as well as in the selection window.

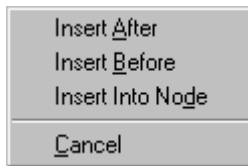
How to Use Drag-and-Drop to Insert a New Container in the Hierarchy Window:

1. Click on the container icon in the selection window.
2. While **holding down the left mouse button**, drag the container icon to the hierarchy window located above the selection window.
As soon as the mouse pointer assumes the (+) icon, you can release the mouse button. The container is inserted after the highlighted container.

or

While **holding down the right mouse button**, drag the container icon to the hierarchy window located above the selection window.
As soon as the mouse pointer assumes the (+) icon, you can release the mouse button.

3. After releasing the mouse, the pop-up menu for specifying where the new container is to be inserted is displayed:



Note

When you insert new containers into an existing node, the subhierarchy of that node is expanded by one level.

If you insert a container before or after a container, the affected hierarchy level is expanded by one container.

You cannot insert a new container before or after the root container!

5.2.3 Using a Drag-and-Drop Operation to Insert Pictures

You can use drag-and-drop to insert pictures in the hierarchy window. The Picture Tree Manager supports drag-and-drop with the left as well as the right mouse button (drag-and-drop with the pop-up menu).

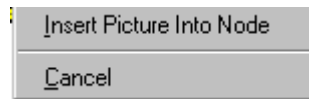
You can work with the Picture Tree Manager using drag-and-drop in the hierarchy window as well as in the selection window.

How to Use Drag-and-Drop to Insert Pictures in the Hierarchy Window:

1. Click on the icon of the desired picture in the selection window.
2. While **holding down the left mouse button**, drag the picture icon to the hierarchy window located above the selection window.
As soon as the mouse pointer assumes the (+) icon, you can release the mouse button.
 - If the selected container is empty, the picture is inserted.
 - If the selected container is not empty, you must confirm the replacement of the existing picture.

or

3. While **holding down the right mouse button**, drag the picture icon to the hierarchy window located above the selection window.
As soon as the mouse pointer assumes the (+) icon, you can release the mouse button.
4. After releasing the mouse, the pop-up menu for acknowledging that the new picture is to be inserted is displayed:



5.3 The Hierarchy

In WinCC, the dependencies among containers and pictures is pictured in the form of a hierarchy.

The nodes of the hierarchy are always made up of containers.

Each container can be basically empty or contain a picture (Graphics Designer).

You can assign any name to the container. However, the container name must be unique and checked by the Picture Tree Manager.

Picture names cannot be changed in the Picture Tree Manager.

Only existing pictures may be included in the hierarchy.

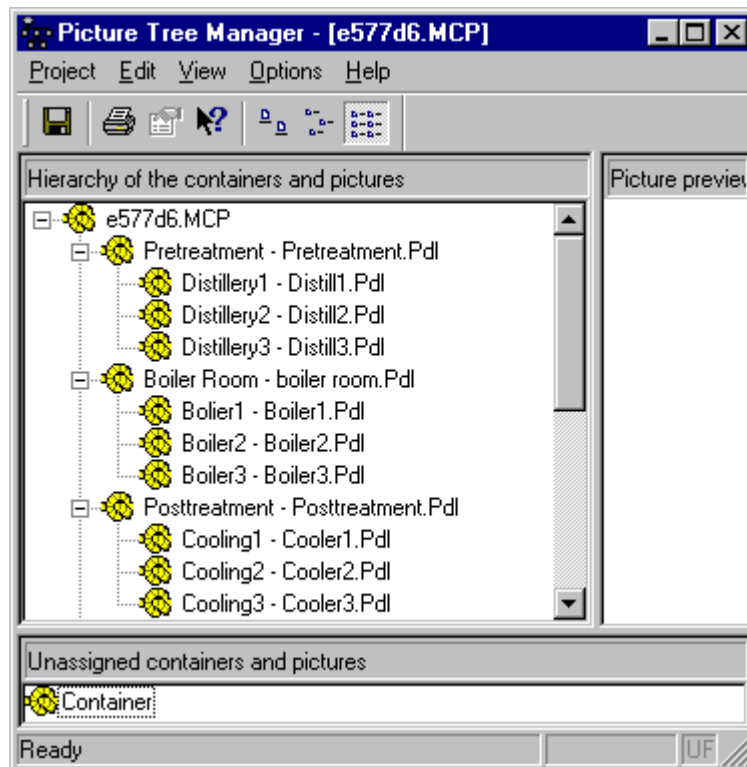
The structure of the hierarchy is open, which means there is no height or width limit prescribed for the hierarchy (tree).

When creating a hierarchy with the help of the Picture Tree Manager, the hierarchy information will be stored in various OS Engineering data locations, e.g. in the message system, in the User Administrator and in measuring point lists. Thus, it is necessary to define the OS hierarchy as early as possible and to adhere to it.

Subsequent changes to the hierarchy at the area level require

- the manual correction of the hierarchy data in the messages,
- the editing of the user authorizations (User Administrator),
- the generation of new packages for the connected multi-clients.

You can find additional information in the chapter "Effects on Other Programs".



This hierarchy is displayed in the following table:

Container Name	Picture Name	Father	Left Neighbor
New.MCP			
Pretreatment	Pretreatment.PDL	New.MCP	
Distillery1	Distil1.PDL	Pretreatment	
Distillery2	Distil2.PDL	Pretreatment	Distillery1
Distillery3	Distil3.PDL	Pretreatment	Distillery2
BoilerRoom	Boiler room.PDL	New.MCP	
Boiler1	Boiler1.PDL	BoilerRoom	
Boiler2	Boiler2.PDL	BoilerRoom	Boiler1
Boiler3	Boiler3.PDL	BoilerRoom	Boiler2
Posttreatment	Posttreatment.PDL	New.MCP	
Cooling1	Cooler1.PDL	Posttreatment	
Cooling2	Cooler2.PDL	Posttreatment	Cooling1
Cooling3	Cooler3.PDL	Posttreatment	Cooling2

Note

It is also possible to insert empty pictures in the hierarchy. However, the pictures must already be loaded in WinCC.

5.3.1 Creating a Hierarchy

All pictures of the projects are in the selection window when you start to build a hierarchy. The hierarchy window contains a root node that contains the name of the project. You cannot load a picture in the root node.

You can create the hierarchy in the following ways:

- Create the hierarchy by means of drag&drop
- Create the hierarchy via the pop-up menu
- Create the hierarchy via the menu bar
- Create the hierarchy - change the container name

Attention:

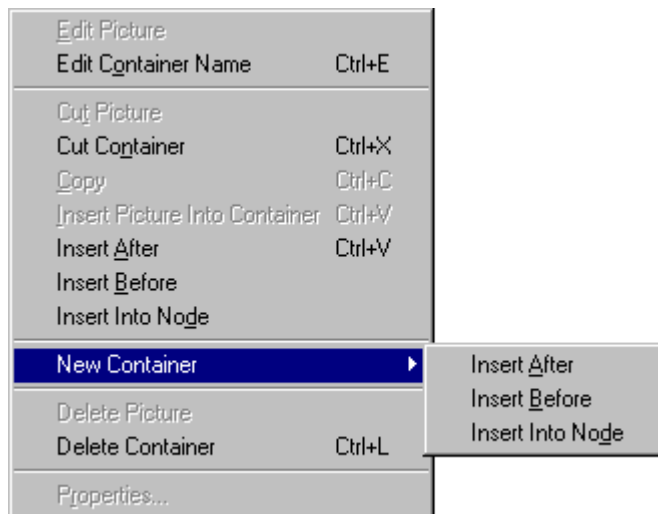
- Modifications to the hierarchy in the Picture Tree Editor are initially local. If you exit the Picture Tree Manager without saving, these changes are lost.
- The "Save" command saves all changes and also notifies all Picture Tree Manager clients that are running in the Runtime module (for example, the group display) so that they can read the new hierarchy.

How to Create the Hierarchy by Means of Drag-and-Drop:

1. Click on the icon of the empty container in the selection window.
2. While **holding down the left mouse button**, drag the container to the hierarchy window.
3. Select the container after which the new container should be inserted. The target container is displayed with a colored background.
4. When you release the mouse button, the new container is inserted in the same level **after** the selected container.

How to Create the Hierarchy by Means of the Pop-Up Menu:

1. Select a container in the hierarchy window.
2. Open the corresponding pop-up menu.



3. You can insert the new container after, before, or in the selected node.

How to Create the Hierarchy by Means of the Menu Bar:

1. Select a container in the hierarchy window.
2. Use the "Edit New Container" menu item to insert a new container.
3. You can insert the new container after, before, or beneath the selected node.

Note

If you insert a new container in an existing node, the hierarchy expands by one level.

If you insert a container before or after a container, the affected hierarchy level is expanded by one container.

How to Change the Name of a Container:

1. In the hierarchy window, select the container whose name you want to change.
2. Click the left mouse button on the selected container to activate the edit mode.
or
Open the pop-up menu and use the "Edit Container Name" menu item to activate the edit mode.
or
Use the key combination "CTRL+E" to activate the editing mode.
3. You can then change the container name.

5.3.2 Changing the Hierarchy

The hierarchy can be changed by moving individual nodes or entire parts of the hierarchy. This can be performed within a level or the levels may be changed. The root node (WinCC project name) cannot be moved.

You can use the following means to change the hierarchy:

- Change by drag&drop
- Change via the pop-up menu
- Change via the menu bar

Note

Inserting a new container into an existing node expands the hierarchy by one level.

Attention:

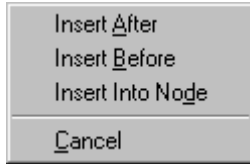
- Modifications to the hierarchy in the Picture Tree Editor are at first local. If you exit the Picture Tree Manager without "Saving", these changes are lost.
- The "Save" command saves all changes and also notifies all of the Picture Tree Manager clients that are running in the Runtime module (for example, the group display) so that they can read the new hierarchy.

How to Change the Existing Hierarchy by Means of Drag-and-Drop:

1. In the hierarchy window, click on the container (node) you want to move.
 2. While **holding down the left mouse button**, drag the container and its subordinate containers to the new position.
 3. When you release the mouse button, the new container with its subordinate containers is inserted in the same level **after** the selected container.
- or

While **holding down the right mouse button**, drag the container and its subordinate containers to the new position.

After releasing the mouse, the pop-up menu for specifying where the new container and its underlying containers are to be inserted is displayed:



How to Change the Existing Hierarchy by Means of the Pop-Up Menu:

1. Select a container in the hierarchy window.
2. Open the corresponding pop-up menu.
3. Use the "Cut Container" menu item to move the container and all of its subordinate containers to the clipboard. The affected containers are displayed in gray.
4. Select the target container in which you want to insert the cut container.
5. Open the corresponding pop-up menu.
6. You can insert the contents of the clipboard into the new position with the "Insert After", "Insert Before" or "Insert Into Node" menu commands.

How to Change the Existing Hierarchy by Means of the Menu Bar:

1. Select a container in the hierarchy window.
2. Use the "Cut Container" menu item or the keystroke combination "CTRL + X" to move the container and all its subordinate containers to the clipboard. The affected containers are displayed in gray.
3. Select the target container in which you want to insert the container.
4. You can insert the contents of the clipboard into the new position with the "Edit" menu commands: "Insert After", "Insert Before" or "Insert Into Node".

5.3.3 Deleting the Hierarchy

In this context, deleting the hierarchy means removing individual containers with all of their subordinate containers from the hierarchy window and thereby, from the hierarchy.

You can use the following means to delete the hierarchy:

- by Drag&Drop
- via the pop-up menu
- via the menu bar

Note

With the "Confirm When Hierarchy Deleted" option, you change the behavior of the Picture Tree Manager when you delete the hierarchy (with or without confirmation)

The pictures deleted from the hierarchy are moved to the selection window and can be reinserted into the hierarchy at a later time.

How to Delete Containers from the Existing Hierarchy by Means of Drag-and-Drop:

1. In the hierarchy window, click on the container (node) you want to move.
2. With the **mouse button pressed** (right or left), drag the selected container and its underlying containers into the selection window.
3. When you release the mouse button, the pictures are moved to the selection window. All information of the deleted and underlying containers are lost in this process.

How to Delete Containers from the Existing Hierarchy by Means of the Pop-Up Menu:

1. In the hierarchy window, click on the container (node) you want to delete.
2. Open the corresponding pop-up menu.
3. Use the "Delete Container" menu item and confirm the inquiry to remove the appropriate container with all of its subordinate containers from the hierarchy.

All pictures are moved to the selection window. All information of the deleted and underlying containers is lost in this process.

How to Delete Containers from the Existing Hierarchy by Means of the Menu Bar:

1. In the hierarchy window, click on the container (node) you want to delete.
2. Use the "Delete Container" menu item or the keystroke combination "CTRL + L" to delete the appropriate container with its subordinate containers from the hierarchy.

Note

All pictures are moved to the selection window. All information of the deleted and underlying containers is lost in this process.

5.4 Effects on Other Programs

The hierarchy created in the Picture Tree Manager directly or indirectly affects the following applications:

- the User Administrator
- the group display
- the Text Library and
- the Alarm Logging

5.4.1 Effects on the User Administrator

If changes to the hierarchy are made in the Picture Tree Manager, the User Administrator has to be opened after saving the changed hierarchy. Only then will the assignment of the authorizations to the hierarchy be updated.

New Parts in the Hierarchy

For newly loaded containers, the entries about the user authorization are missing in the User Administrator. After you save the hierarchy, these new system sections are available in the User Administrator.

Deleting in the Hierarchy

Containers that are deleted from the hierarchy are also deleted in the User Administrator. Upon deletion of this container, all corresponding information contained in the User Administrator is also lost.

5.4.2 Effects on the Group Display

In certain cases, the hierarchy affects the group display. The objects of the group display can only receive and relay messages if the pictures are arranged appropriately in the hierarchy.

Receiving Messages:

The pictures from which you want to receive messages must be on or beneath the level of the corresponding group object in the hierarchy.

Relaying Messages:

The pictures to which you want to relay messages must be on or above the level of the corresponding group object in the hierarchy.

5.4.3 Effects on the Text Library

The container names are managed in the Text Library.

If you load a new container, the name of the container is entered in this Text Library in the current language.

Switching Languages:

- After a language switch, all container names will be displayed in the selected language. Container names for which there are no corresponding names are displayed in the language in which they were loaded.
- The language switch affects the Picture Tree Managers the next time it is called up.
- If the language is switched in Runtime, the names of all of the containers that have not been translated remain empty.

5.4.4 Effects on Alarm Logging

In Alarm Logging, individual messages can be assigned to an area of the created hierarchy. This has to be performed manually by the user in Alarm Logging. Required for the message assignment is the picture hierarchy created in the Picture Tree Manager or generated through mapping.

If an area name (e.g. Container1) is assigned to a message, the message will only be displayed, if the user possesses an authorization (User Administrator) for this area. If no area name is specified for a message, the message is always displayed.

Assigning a Message to an Area

In Alarm Logging, select a message that you want to assign to a certain area. With a right mouse-button click, open its pop-up menu and then select "Properties". In the "Single Message" dialog, select the "Texts" tab and manually enter the area name in the "Area" field.

6 Graphic Objects

6.1 The 3D-Bar Object



The **3D-bar** is assigned to the smart objects group. Its properties (attributes) influence its appearance and functionality.

It displays values graphically relative to a high and low limit. The user can freely configure the type of the 3D display.

All object attributes of the selected object are displayed in the "Object Properties" dialog window in the "Properties" tab.

The "3D-bar graph" object is described using the following attributes:

Basis	Object Name Layer
Geometry	Position X Position Y Width Height Base X Base Y Alpha Beta Angle Settings Bar Height Bar Width Bar Depth Bar Direction Display Axis
Colors	Border Color Background Color
Styles	Border Weight Border Style Background Light Effect
Miscellaneous	Operator-Control Enable Authorization Display Tooltip Text Maximum Value Zero Point Value Minimum Value Process Driver Connection

Limits	Limit 0
	Monitoring 0
	Bar Color 0
	Limit 1
	Monitoring 1
	Bar Color 1
	Limit 2
	Monitoring 2
	Bar Color 2
	Limit 3
	Monitoring 3
	Bar Color 3
	Limit 4
	Monitoring 4
	Bar Color 4
	Limit 5
	Monitoring 5
	Bar Color 5
	Limit 6
	Monitoring 6
	Bar Color 6
	Limit 7
	Monitoring 7
	Bar Color 7
	Limit 8
	Monitoring 8
	Bar Color 8
	Limit 9
	Monitoring 9
	Bar Color 9
	Limit 10
	Monitoring 10
	Bar Color 10

6.2 Group Display

The object **group display** offers a hierarchically concentrated display of the current states of certain message types. However, a connection to the message system within WinCC does not exist.

The display of the message types via the group display takes place in four display fields arranged side-by-side utilizing colors, flashing and texts. The preset colors and flashing modes correspond to the representations commonly used in process engineering.

The following message types are used (on the group display from left to right):

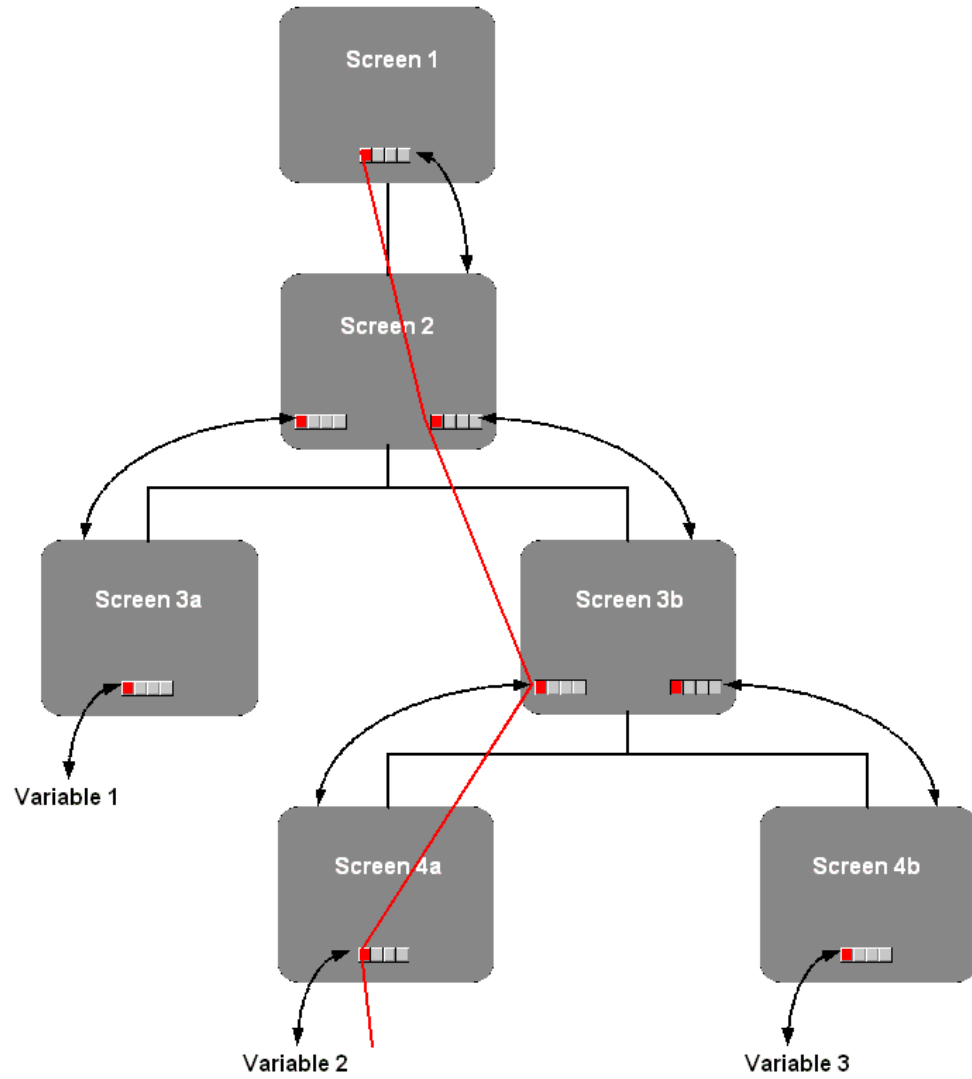
- Display Field 1:
Alarm High, Alarm Low
- Display Field 2:
Warning High, Warning Low, Tolerance High, Tolerance Low
- Display Field 3:
PLC Process Control Fault, PLC Process Control Error, OS Process Control Fault
- Display Field 4:
Operator Prompt

Via the group display, states can be displayed in runtime in an underlying picture and a picture change to this picture be performed. This possibility to quickly navigate to an error source is an essential function for the operator and provides him or her with a clear and simple process control.

The path to the picture – in which the error source is displayed – runs in the hierarchy tree of the picture hierarchy and is managed by the Picture Tree Manager.

The path through the picture hierarchy is determined by connecting the respective group display with the desired picture in the underlying picture level.

The contents of the tags that contain the group values are passed on to the upper-most picture level, where the individual group values are ORed with each other.



Connecting a Group Display to a Picture

Via the group display, states can be displayed in runtime in an underlying picture and a picture change to this picture be performed. For this purpose, the group display is connected to the concerning picture and the event configured (e.g. a mouse-click) that is to trigger the picture change.

The fastest and easiest way to carry out the configuration is via the Dynamic Wizard. To do so, proceed as follows:

- Select the concerning group display.
- If the Dynamic Wizard palette is not displayed, open the menu "View" and select the "Toolbars..." entry. In the "Toolbars" dialog, activate the check-box "Dynamic Wizard".
- Select the "Standard Dynamics" tab from the Dynamic Wizard palette.
- Start the "Connect Group Display to Picture" Wizard via a double-click and perform the desired settings. Among other things, the Wizard generates a tag named @<PictureName> and connects it to the "Group Value" attribute of the group display. <PictureName> is the name of the picture to which the group display is to be connected.
- To configure the event that is to trigger the picture change (e.g. a mouse-click), start the "Open Picture via Group Display" Wizard from the "Picture Functions" tab of the Dynamic Wizard palette and perform the desired settings.

Connecting a Group Display to a Tag

For the group display to display the states of the configured message type, it must be connected to a tag containing the states.

The individual Bit positions of this tag are interpreted as follows:
Status Information:

Bit in DoubleWord	Message Class	Message Type
Bit 31 (MS Bit)	Alarm	AH
Bit 30	Alarm	AL
Bit 29	Warning	WH
Bit 28	Warning	WL
Bit 27	Tolerance	TH
Bit 26	Tolerance	TL
Bit 25	Process Control Message 1	PLC – Fault
Bit 24	Process Control Message 1	PLC – Field
Bit 23	Process Control Message 2	OS – Fault
Bit 22		
Bit 21		
Bit 20	Operator Prompt	OR
Bit 19		
Bit 18		
Bit 17		
Bit 16	Measuring Point locked	

Acknowledgment Information:

Bit in DoubleWord	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	TH acknowledged
Bit 10	Tolerance	TL acknowledged
Bit 9	Process Control Message 1	Fault acknowledged
Bit 8	Process Control Message 1	Field acknowledged
Bit 7	Process Control Message 2	Fault acknowledged
Bit 6		
Bit 5		
Bit 4	Operator Prompt	OR acknowledged
Bit 3		
Bit 2		
Bit 1		
Bit 0 (LS Bit)		

The fastest and easiest way to carry out the configuration of the connection is via the Dynamic Wizard. To do so, proceed as follows:

- Select the concerning group display.
- If the Dynamic Wizard palette is not displayed, open the menu "View" and select the "Toolbars..." entry. In the "Toolbars" dialog, activate the check-box "Dynamic Wizard".
- Select the "Standard Dynamics" tab from the Dynamic Wizard palette.
- Start the "Connect Group Display to PCS7 Measuring Point" Wizard via a double-click and perform the desired settings. In this case, the "Group Value" attribute of the group display is connected to the structure tag "EventState" of the concerning PCS7 measuring point.

If the group display is to be connected to a data manager tag, proceed as follows:

- Access the pop-up menu of the group display and select the "Properties" command.
- In the "Properties" tab, select "Miscellaneous".
- Access the pop-up menu in the "Group Value" line, "Dynamic" column and select "Tag...". The tag must be a signed 32-Bit value tag.
- In the "Select Tag" window, select one of the process level tags or one of the internal tags.
- In the "Update" column, set the update cycle to "Upon Change".

If an internal tag is used, it should have the start value 65535 (0x0000FFFF). As a result, the group display will not see any unacknowledged messages upon startup.

Note:

In PCS7 applications, the message system is supplied via "Alarm-8" mechanisms, the group display via the "EventState" of the measuring points.

All object attributes of the selected object are displayed in the "Object Properties" dialog window in the "Properties" tab. The value assignment of the group display is configured using the "Dynamic Wizard".

The "Group Display" object is described using the following attributes:

Basis	Object Name Layer
Geometry	Position X Position Y Width Height Button 1 Width Button 2 Width Button 3 Width Button 4 Width Same Size
Colors	Background Color
Styles	3D Border Weight
Font	Font Font Size Bold Italic Underline X Alignment Y Alignment
Flashing	Blinkfrequenz
Miscellaneous	Operator-Control Enable Authorization Display Tooltip Text Group Value Group Relevant Bit Pattern Group Display User Value 1 User Value 2 User Value 3 User Value 4

Message Types	Message Type
	Display Text
	Came In - Text Flashing
	Came In - Text Color On Attribute
	Came In - Text Color Off
	Came in - Background Flashing
	Came In - Background Color On
	Came In - Background Color Off
	Came In Acknowledged - Text Flashing
	Came In Acknowledged - Text Color On
	Came In Acknowledged - Text Color Off
	Came In Acknowledged - Background Flashing
	Came In Acknowledged - Background Color On
	Came In Acknowledged - Background Color Off
	Went Out Unacknowledged - Text Flashing
	Went Out Unacknowledged - Text Color On
	Went Out Unacknowledged - Text Color Off
	Went Out Unacknowledged - Background Flashing
	Went Out Unacknowledged - Background Color On
	Went Out Unacknowledged - Background Color Off
Lock	Lock Display
	Lock Display Text
	Lock Text Color
	<u>Lock Background Color</u>

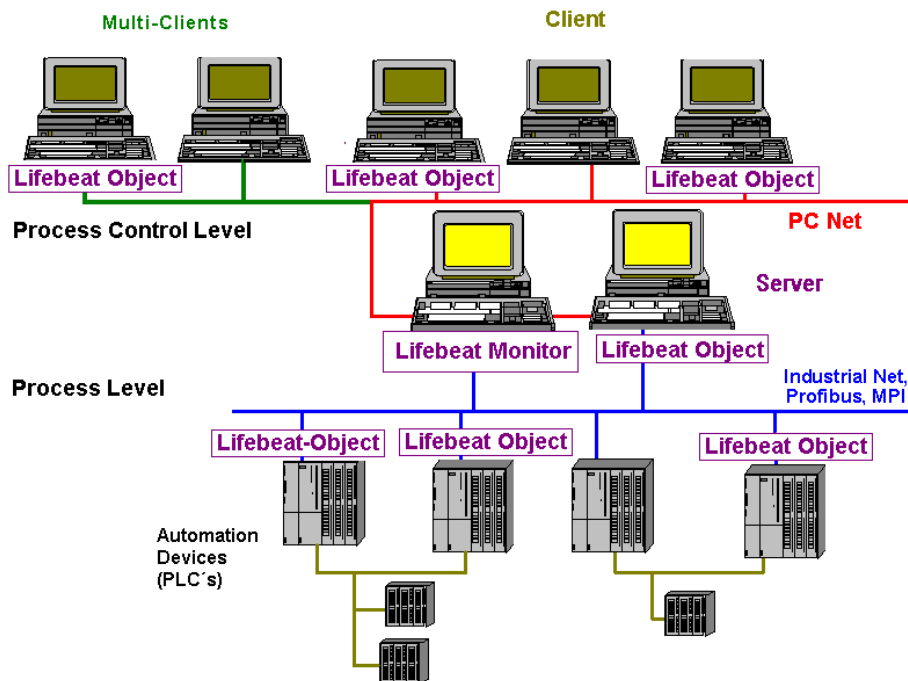
7 Lifebeat Monitoring



General Information About Lifebeat Monitoring

Lifebeat Monitor – Lifebeat Object

The sign-of-life monitoring is carried out centrally from a Lifebeat Monitor computer. The Lifebeat Monitor monitors all server-, client and multi-client computers and the automation devices, which can be reached via the PC network and the industrial network and are assigned to the Lifebeat Monitor (Lifebeat objects).



The above diagram illustrates an example of the structure of a Lifebeat Monitoring system with computers on the process control level and the underlying process level.

The configuration of the lifebeat monitoring is carried out via an OPC connection OPC – Connection, the NetDDE is no longer supported.

Note

Prerequisites for Lifebeat Monitoring are:

1. MS-Windows NT operating system on both the Lifebeat-Monitor computer as well as the Lifebeat-object computer
 2. The Lifebeat Monitor must possess administrator privileges.
-

7.1 Function Principle of Lifebeat Monitoring

The monitored components are operator stations (servers, clients and multi-clients) belonging to WinCC projects and the associated automation devices. A monitoring program runs on each server and multi-client which both views the components belonging to a project as well as monitors "foreign components". In order to perform this task, all system sections must be connected to a continuous network.

Tasks of the Server

The tasks of the control system are divided among several PCs. The tasks are divided according to a server-client structure:

- Servers acquire the data for the process images and messages of the PLCs.
- A server computer executes the sign-of-life monitoring (Lifebeat Monitor).
- In order to record the data, the servers are connected to the automation devices via industrial networks (Profibus etc.).
- Servers make the process data available to the clients and multi-clients and manage processing states.

Tasks of the Multi-Clients

The tasks of the multi-clients are:

- Multi-clients are used for the server-wide control and monitoring of the entire plant.
- Multi-clients fetch all states of the respective servers via PC networks.

Tasks of the Clients

The tasks of the clients are:

- Client stations are used for the server-specific control and monitoring of the entire plant.
- Via PC networks, clients retrieve all states from the respective server.

Tasks of the Automation Devices

The tasks of the automation devices are:

- The automation devices execute on-site the measurement tasks, control tasks and regulation tasks.
- All process-image tags which WinCC can access are located in the automation systems.
- All PLCs connected to the process bus can be monitored.

Monitoring

For monitoring, the following operating states are relevant:

- Connection made
- Connection not made

Monitoring Cycle

You can set the monitoring cycle to the values **5 s**, **10 s**, or **1 min** within the "Lifebeat Monitoring" dialog window. A default monitoring cycle of **10 seconds** is preset.

Project

A project is assigned a group of automation devices, a single-user computer and/or server computer with one or more client computers.

7.2 Lifebeat Monitoring by Means of OPC Connection

The communication between WinCC and the specific types of automation systems is established via one channel.

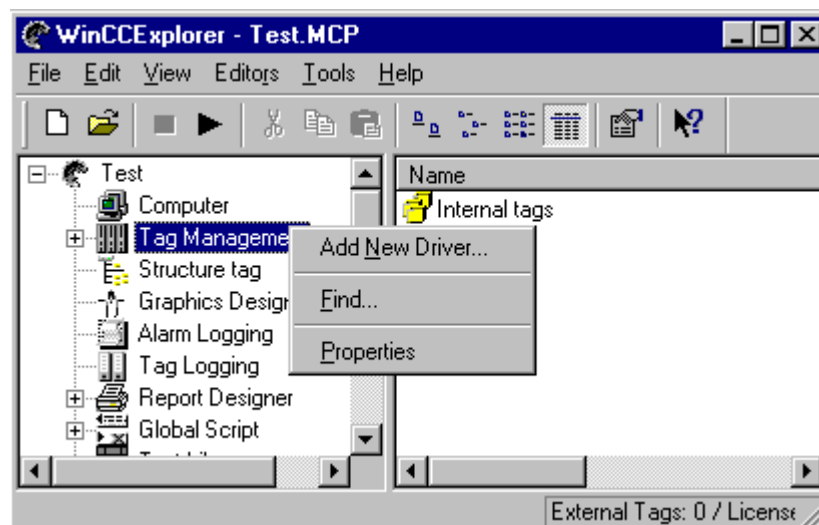
As the software for the OPC server and the OPC client are contained in the WinCC basis system, WinCC can simultaneously be used as OPC server and OPC client. As a client, the computer can connect simultaneously to several servers.

The software required for OPC is installed during WinCC installation.

The OPC client utilizes a channel unit. A general configuration of the channel unit is not required.

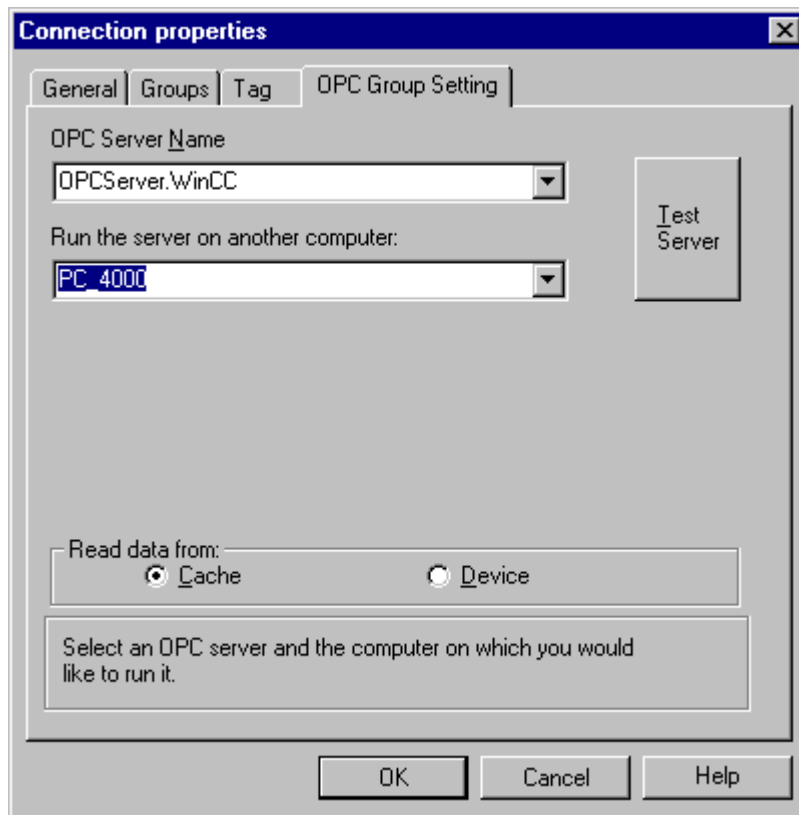
Adding a New Driver

1. Start WinCC and add a new driver "OPC.CHN" in tag management.



2. Establish a connection to the server via the entry "New Connection" in the "OPC Unit #1" pop-up menu.

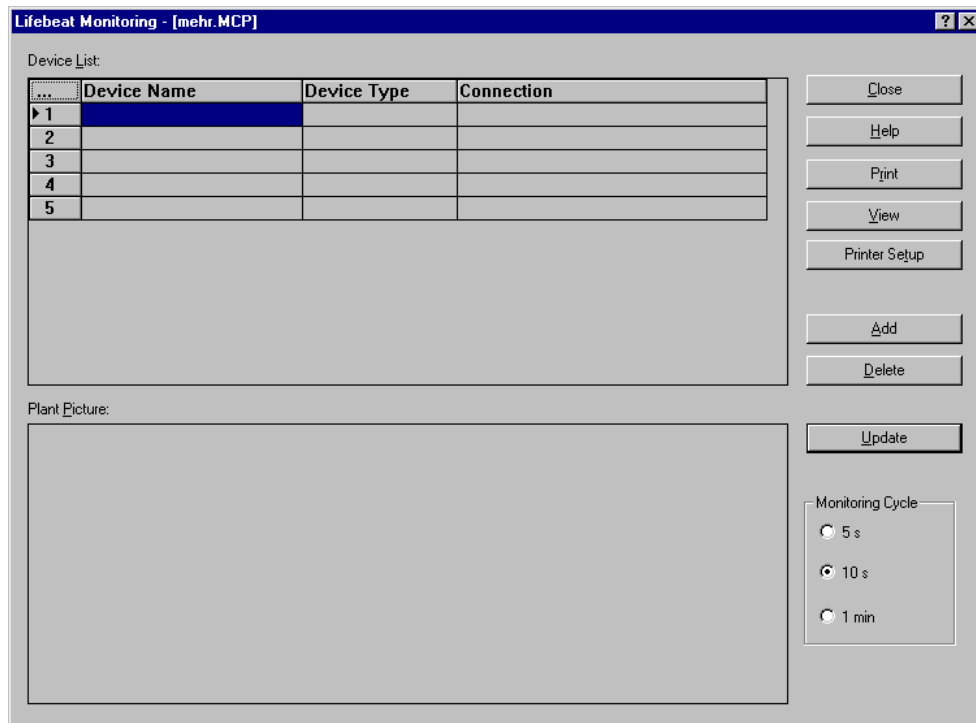
3. In the pop-up menu select the newly created connection, the entry "Properties" and activate the tab "OPC Connection".
 - In the area "OPC Server Name", enter the name "OPCServer.WinCC".
 - In the box "Start the Server on this Computer", enter the computer name from which the monitoring is to be performed.
 - Click on the button "Test Server" to determine whether the corresponding OPC connection can be established.



Note

Additional help can be found in the WinCC on-line help for the OPC channel.

7.3 The Dialog Window of Lifebeat Monitoring



This picture shows you the structure of the "Lifebeat Monitoring" dialog window.

The following work steps are necessary to open the "Lifebeat Monitoring" dialog window:

How To Open the "Lifebeat Monitoring" Dialog Window:

1. Use the right mouse button to click in the project navigation window on "Lifebeat Monitoring".
2. In the pop-up menu that appears, select the menu item "Open".
3. This selection opens the "Lifebeat Monitoring" dialog window in which you can create or change the desired configuration.

Within this dialog window you can configure the complete Lifebeat Monitoring.

Structure of the Dialog Window

The dialog window is divided into the following areas:

- **Device List:**

The device name refers to the Lifebeat object. All connections to the Lifebeat object are entered in the device list. As a default, the device list contains five lines. You can change the number of input lines with the "Add" and "Delete" buttons.

In a multi-client project, the number of lines in the device list corresponds to the number of monitored servers. The device names and device type are predefined. No input lines can be added or deleted.

- **Buttons:**

The buttons are used for adding, deleting, printing, etc. the devices in the device list. The buttons Add and Delete cannot be activated in a multi-client.

- **Plant Picture:**

All of the configured connections are displayed as a schematic plant picture in this area.

- **Monitoring Cycle:**

Use this selection box to set the monitoring cycle of the connection. Ten seconds is set as a default.

How to Enter a Lifebeat Object (not with multi-client)

Open the editor Lifebeat Monitoring and make the following entries:

- Device Name should refer to the Lifebeat object
- Under "Device Type", select the operator station PC.
- Under Connection, select the previously created connection.
- Click on "Update" and then on "Close" to exit the dialog.
- If several objects are to be monitored, these must be entered as described.

After the configuration, one tag must be entered for each OPC connection. The tags must start with @ and be followed by the device name assigned above.

Note

If a connection is added or edited in Tag Management, this connection must be reassigned in the Lifebeat Monitoring editor. Otherwise, the alarm system cannot be opened.

On the multi-client, no configuration in the editor Lifebeat Monitoring is possible. Instead, a multi-client provides an overall view to all lifebeat objects of those server projects, whose packages have been loaded

Troubleshooting Tips

Following a failure, the Lifebeat Monitor cannot be opened.

Check whether the temporary file Lbmcs.tmp is present in your WinCC project folder (in which the corresponding .MCP file is also located). If yes, then delete this file. Now start the Lifebeat Monitor.

7.3.1 The Device List of Lifebeat Monitoring

General Information about the Device List

Lifebeat Monitoring is configured by means of the device list. Each device name is stored as a tag within the WinCC Explorer. The tag name has the following structure:

"@<Devicename>." Example: For the device name "G120", a tag named @G120 is created.

For Lifebeat Monitoring, the data type of the tags is of secondary significance as the status of the tags is the only thing that is scanned.

Note

In Lifebeat Monitoring, a tag named @<DeviceName> is created for each device name. In the Picture Tree Manager, a tag named @<PictureName> is stored for each picture containing a group display. This may cause conflicts due to identical names. To avoid identical tag names, the picture name must not be identical to the device name or system tags with the name prefix @.

Should this nevertheless occur, a corresponding message will be output. In the log file "LifebeatMonitoringCS.log", the tag names causing a name conflict will be listed. By changing the device name, the name conflict can be resolved. In addition, the @ symbol must not be used at the beginning of the device name. The @ symbol signifies tags and pictures created by the system.

Lifebeat Monitoring stores system tags in the "LBM" tag group. When updating, all tags in this group will be deleted and then recreated. Because of this, no tag must be configured within the "LBM" tag group.

Structure of the Device List Table

Area Name	Meaning
Device Name	<p>Enter a unique device name in this box. The name can have a maximum of 21 characters. The following naming conventions exist for assigning device names:</p> <p>No key words (according to C conventions), e.g.: float, type, main, void</p> <p>No special characters or coupling characters (@ + - / & ' " [] * { } . : < > ; = \)</p> <p>No spaces</p> <p>The device names are predefined in a multi-client project. As the device name, the symbolic computer name is entered.</p>

Area Name	Meaning
Device Type	<p>Use this box to set the device type. Double click on the box to open a selection box. The following device types are available:</p> <p>OS-OP Operator Panel</p> <p>OS-PC Office PC</p> <p>OS Industry PC</p> <p>PLC-4xx S7-4xx</p> <p>PLC-3xx S7-3xx</p> <p>PLC-2xx S7-2xx</p> <p>PLC-2xx S7-2xx</p> <p>Multi-Clients</p> <p>The device type is predefined in a multi-client project. As the device type, the OS status is entered.</p>
Connection	<p>Double click on the box to open a selection box. Select one of the available configured connections in this box.</p>

7.3.2 The Buttons of Lifebeat Monitoring

Button	Meaning
Close	Use this button to close the dialog window.
Help	Use this button to open the on-line help for Lifebeat Monitoring.
Print	To print the Lifebeat Monitor area picture
Printer Setup	Use this button to set the printer settings.
View	Use this button to display a print preview on the screen.
Add	Use this button to create an empty line within the device list. This button is not available in a multi-client project.
Delete	<p>Use this button to delete a line within the device list. You must pay attention to the following:</p> <p>The device name is only deleted from the device list, but not from the tag list of the corresponding connection in the WinCC Explorer. This is due to the fact that other modules of the WinCC system can access this tag.</p> <p>If you want to delete a line, you must highlight the entire line and then use the "Delete" button. To highlight a line, activate the button with the device number.</p> <p>When you use the "Delete" button, the system does not ask you to confirm if you really want to delete the selected line.</p> <p>You can only delete individual lines. You cannot highlight multiple lines at the same time to delete them.</p> <p>This button is not available in a multi-client project.</p>
Update	<p>Use this button to create/update the system picture. As a default, the system picture is created and stored under the name "@CONFIG.PDL" in the project-related picture directory. The geometry of the picture corresponds to the settings that were made with the Split Screen Wizard.</p> <p>If you receive an error message "Picture could not be created! Cause: Necessary object types not available" while you are creating the plant picture, this is due to a missing object OLL "BITMAP.OLL". This missing OLL file can be linked via the "Object-OLL" (WinCC Explorer) dialog window.</p>

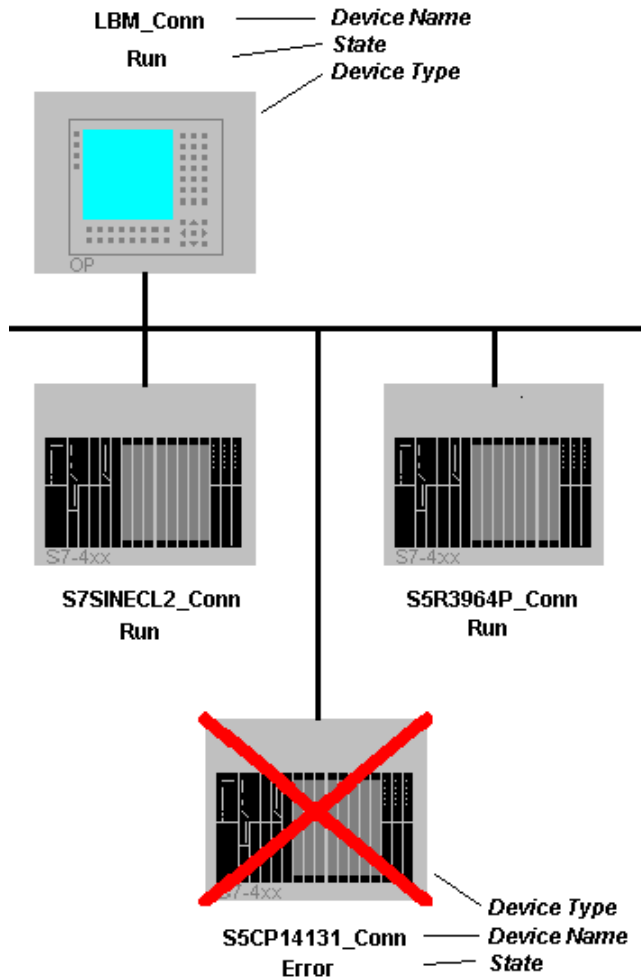
Note

If the "Text Library" editor is open, you cannot create a new system picture. You must first close the "Text Library."

7.3.3 The Lifebeat-Monitoring Plant Picture

All components to be monitored are displayed in graphic form within the system picture. The components that are currently not ready to function (for example, due to an error) are crossed out in the graphic with a red line.

The graphic structure of a plant picture



This picture shows you an example of a plant picture "@CONFIG.PDL".

If multiple PLCs are connected to an operator station, they are displayed in a consecutive sequence.

Note

The status box of the operator station or the PLC displays the status RUN or ERROR. The ERROR status is indicated by a red line.

The message "Server failure" is also possible in a multi-client project.

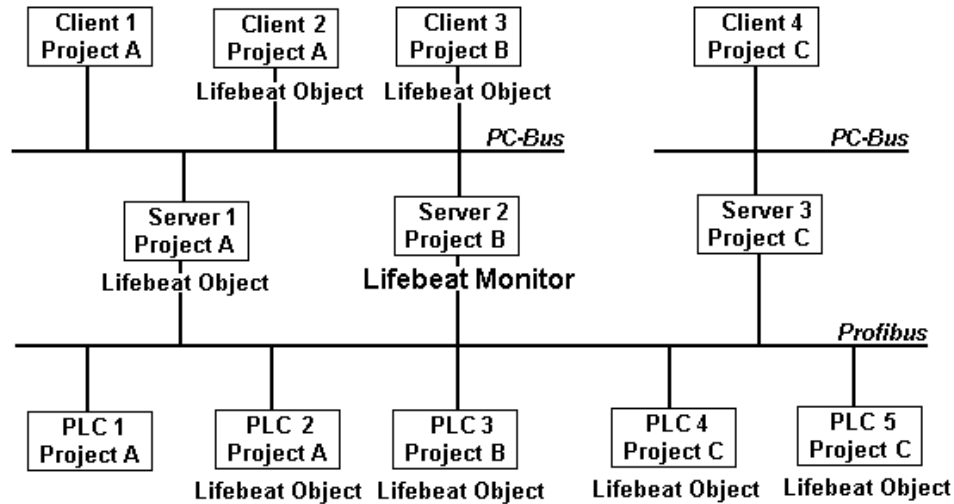
7.4 Visualizing Monitoring in Runtime

Visualizing Lifebeat Monitoring

- Like any created picture, the visualization of the system picture can be called by means of the appropriate configuration, for example, buttons with a picture selection of "@CONFIG.PDL".
- In the preconfigured basic data that are present in the current project when you use the Split Screen Wizard, the picture selection for the plant picture is already available for a button in the set of key commands.
- With a multi-client project, click on the picture to display the server configuration. This is not possible if the server has failed.

7.5 Practical Example of Lifebeat Monitoring

Displayed in the figure below is a WinCC operating and monitoring system in which Lifebeat Monitoring is being run.



Monitoring of Several Projects

The Lifebeat Monitor is Server2, which was configured for Project B. The monitor monitors Client3 and PLC3, both of which belong to Project B, as well as Server1, Client2 and PLC2, which belong to Project A.

PLC4 and PLC5 continue to be monitored. These PLCs are monitored via the existing Profibus connection. It is not possible to monitor Server3 and Client4, as no PC network connection to these computers exists.

Error-Free Monitoring Operation

The monitoring of the Lifebeat objects is carried out via the internal tag generated by the Lifebeat Monitoring editor. The Lifebeat Monitor Server2 sends the status of this tags to all configured Lifebeat objects using the set cycle time, e.g. every 10 seconds. During error-free operation, the addressed Lifebeat objects reply each time to the Lifebeat Monitor Server2. Through the tag status, the Lifebeat Monitor recognizes the error-free operation of all Lifebeat objects configured for Lifebeat Monitoring.

Failure of Server1

Let's assume an error occurs on Server1, for example due to a power failure. After the Lifebeat Monitor Server2 has sent the status of the tag to Server1, no reply will be returned due to the failure of Server1. This is recognized by the Lifebeat Monitor Server2. After that, a corresponding message is sent to the Client3 configured for Server2.

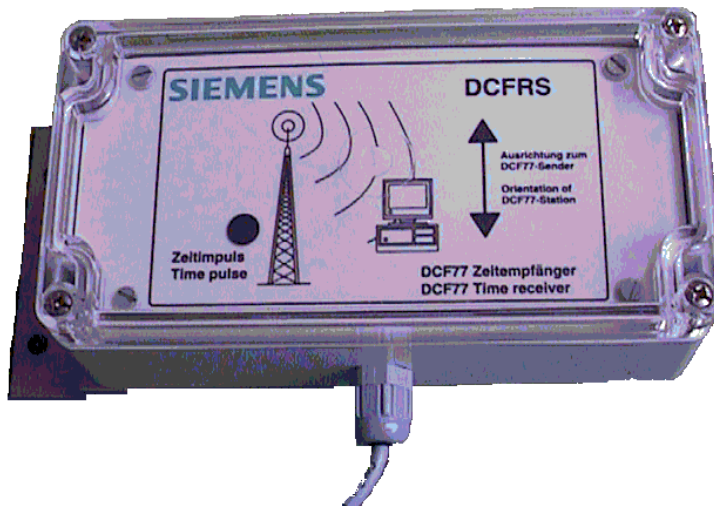
8 Timesynchronisation

8.1 Time Signal Receiver

DCF77-Receiver DCFRS

The DCF77 receiver is an external receiver station for time signals used for synchronizing the computer clock. The receiver is connected to the COM2 serial interface.

The signals originate from the long-wave transmitter DCF77, which has been broadcasting encoded time information for over 20 years at frequency 77.5 kHz. Because of its central location in Central Europe (Mainflingen near Frankfurt) and its extensive range (up to 2000 km), this transmitter is significant far beyond Germany.

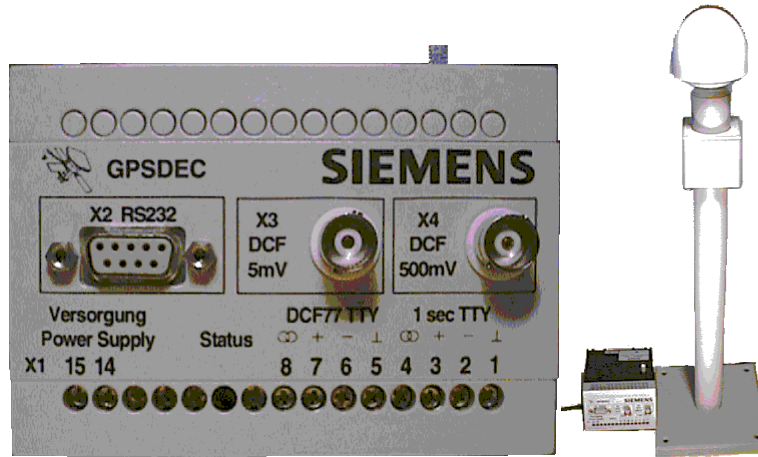


DCF77 Driver

A driver is supplied for the DCFRS receiver. This must be loaded before the DCFRS receiver is put into operation. The driver and the description are included in the scope of delivery for the DCFRS.

GPS-Receiver WINGGPS

The GPS receiver is an external receiver station for satellite signals used for synchronizing the computer clock. The receiver is connected to the COM2 serial interface.



WINGGPS Driver

A driver is supplied for the WINGGPS receiver. This must be loaded before the WINGGPS receiver is put in operation. The driver and the description are included in the scope of delivery for the WINGGPS.

8.2 Functionality



General Information about the "Time Synchronization" Editor:

On the one hand, time synchronization is implemented as a Windows NT system driver and on the other hand, as a WinCC application function for systems with a SIMATIC Industrial Ethernet (H1) or a Profibus SINEC L2/L2 . WinCC-OS as the active time master, is therefore responsible for synchronizing all the other operator stations and PLCs on the system bus with the current time. This allows a system-wide chronological coordination of messages.

Depending on your selection, the time is taken from the following:

- A GPS receiver connected by means of RS232
- A DCF77 receiver connected by means of RS232
- The internal operator station clock

.A kernel driver operates the serial interface and synchronizes the internal operating system time. Based on the driver API, the actual time synchronization handles the master-slave administration and the distribution function (sending and receiving time message frames as well as synchronizing) of the time. You can also use the driver API to access various diagnostics functions that you can use for installing or servicing the hardware. You assign parameters to the kernel driver by means of an object in the Windows NT Control Panel ("DCF-77"). You can set such items as the serial interface, the synchronization interval, or the maximum deviation permitted for the internal time. You assign parameters for time synchronization by means of the Time Synchronization Editor in the WinCC Explorer.

The DCF77 receiver is used primarily in the Federal Republic of Germany and bordering countries (within a radius of 1500 km to 2000 km around Frankfurt/Mainflingen). It provides the exact official time of the Federal Republic of Germany with a maximum deviation of 1 s in 1 million years, provided that reception is undisturbed. If this is not available, or if the place of use is outside the transmitting range of the long-wave transmitter DCF77, a GPS (Global Positioning System) unit can be used. With respect to the accuracy of the absolute time information, the same statements can be made as for the DCF77 receiver. For systems in which the absolute time is not important, you can use the internal clock of the active time master for synchronizing. You assign parameters to the DCF77 receiver by means of the DCF77 object in the Windows Control Panel.

Functional Principle of Time Synchronization:

Time synchronization is a WinCC application that is operated as a master-slave system with optional redundant masters. This means that there are two or more time masters in one redundant system. You can configure each operator station as the time master (availability of a radio time reception service is not necessary; reference time is then provided by the RTC). The master that powers up first sends a time message frame over the network (including the set synchronization interval) to the other masters and all slaves. In this way, this master becomes the active master; all the other operator stations and PLCs on the bus become slaves.

During power up, all masters have to check to see if a master is already active on the bus and is sending time message frames (the waiting time for a time message frame to arrive after power up is derived by multiplying the set synchronization interval by four). When the master that has powered up in this manner receives a time message frame, it acts immediately like a slave (in the manner described below). If this master receives no time message frame after the waiting time has elapsed, it begins sending time message frames (as described above).

By receiving the time message frame, the redundant masters recognize their slave setting and synchronize their clock to the time contained in the time message frame. With the help of a timer, they now check (according to the synchronization interval contained in the time message frame) the cyclic receipt of the time message frames from the active master. If three consecutive time message frames fail, the first redundant master that notices the failure begins to send time message frames itself. This mechanism guarantees that only one master transmits time message frames. Where a DCF77-/GPS receiver is also intact, the redundant masters use the received time message frames only to check the function of the active master. No comparison (check) is made between the time of their own DCF77-/GPS receiver and the time of the received time message frames. Therefore all redundant masters behave like time slaves.

All time slaves and redundant masters on the system bus synchronize their internal clock when they receive a time message frame.

The time-zone-dependent time offsets of the system time and the switchover between daylight saving time / standard time are performed automatically by the time zone set in Windows and the daylight saving time / standard time switchover. In this way, the correct time display and switchover are also possible when there is interference in time reception. If you are using a DCF77 receiver, every time the system is powered up, a warning is entered in the event report if time zone and DST / ST switchover (CET / CEDST) do not match. From a GPS system, the UTC is provided, regardless of the time zone and standard time/daylight saving time. For this reason, the system time must be corrected by the driver by means of the time zone and daylight saving time adjustment set in Windows.

If the time synchronization is realized via an Industrial Ethernet time transmitter (H1), the time transmitter must be set to the standard time of the local time zone. The summer time switch must not be activated on the Industrial Ethernet time transmitter (H1). The operator station receives the time telegram from the connected system bus of the PLC and carries out the summer time/winter time switch according to the settings of the operating system.

8.3 The Runtime Process CCTMTimeSync.EXE

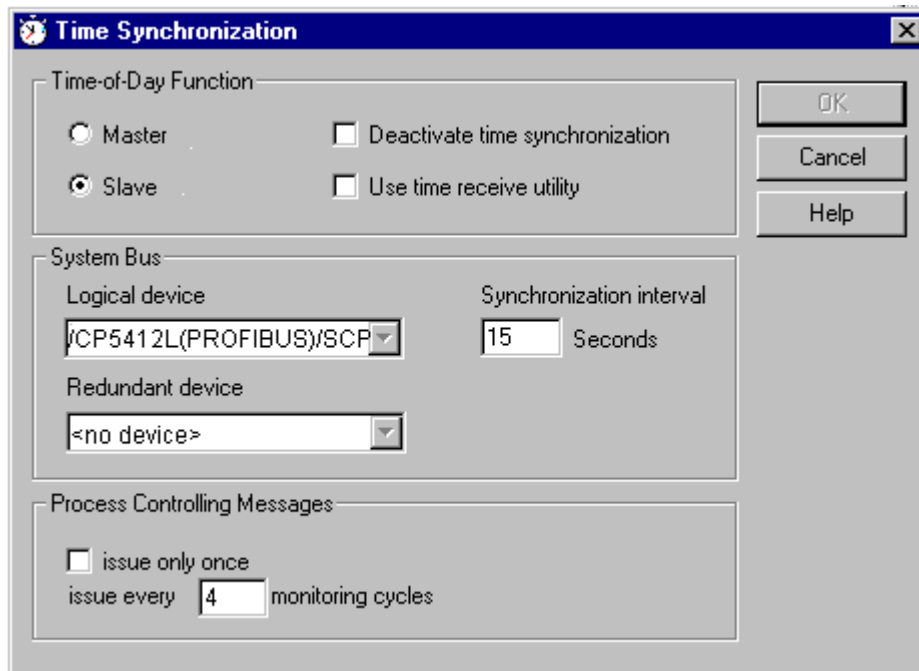
During the Runtime process CCTMTimeSync.EXE, the following must be noted:

With a CP1413, it is not possible to write the time. Therefore, the initial adjustment is dropped. This means, you have to wait until the CP reports that the time in DP-RAM is valid. Until this takes place, the Runtime process of the time synchronization will not adjust the RTC of the operator station. During this phase, no synchronization takes place. The synchronization can only start if the time has been validated in the CP.

8.4 Dialog "Time Synchronization"

You can set parameters for time synchronization in the WinCC Explorer. To open the necessary dialog, proceed as follows:

1. Use the right mouse button to click in the project navigation window on the editor "Time Synchronization".
2. In the pop-up menu that appears, select the "Open" menu item.
3. This action opens the dialog window "Time Synchronization" and you can make all the necessary settings.



Structure of the Dialog Window:

Box	Meaning
Time Function	Group Box
- Master	Indicates that the operator station in question can be a master. The station does in fact become a master if no other master is active on the bus. Note: No provision has been made for an operator station to become a master automatically when a time reception module is present.
- Slave	Indicates that the operator station in question is being operated as a slave.

Box	Meaning
<ul style="list-style-type: none"> - Use Time Receive Utility 	<p>If this check-box is activated, the time of a connected time signal receiver will be used via the time receiving service. If the active master becomes a passive master (e.g. due to a failure), the time receiving service will be deactivated internally. The check-box will remain activated to allow the time receiving service to continue automatically once the active mastership resumes. If a time signal receiver has been installed on an OS, then this check-box has to be activated. This applies to both the operation as the master as well the operation as the slave. Another prerequisite is the activation of the time reception service in the Control Panel.</p>
Deactivate Time Synchronization	<p>If this parameter is set, time synchronization is temporarily deactivated. The settings which have been made are retained.</p>
System Bus	Group Box
<ul style="list-style-type: none"> - Logical Device 	<p>A logical interface, over which the time synchronization of the system bus is to be carried out, can be selected from this field. The setting options in this dialog depend on the device used.</p> <p>Industrial Ethernet Devices:</p> <ul style="list-style-type: none"> - CP1413: Can only be used as slave, synchronization interval can be set. - CP1613: Can be used as master/slave, 10 sec. synchronization interval can not be changed. <p>PROFIBUS Devices:</p> <ul style="list-style-type: none"> - CP5412: Can be used as master/slave, synchronization interval can be set. - CP5613: Can only be used as slave, synchronization interval can be set.
Redundant Device	<p>If a redundant device is available, (e.g. 2 CP1413 were installed), this device can be selected here. If the synchronization in Runtime via the logical device fails, the systems switches to the redundant device and a process control message is triggered. If a redundant device is selected, only slave operation is possible for this operating station.</p>
<ul style="list-style-type: none"> - Master - Synchronization Interval 	<p>Time interval in which an active master transmits its cyclic synchronization telegram or in which a slave expects its telegram. Range of 15 s to 60 s, default 15 s. The unit of measure for this box is "Seconds."</p>
Process Control Messages	Group Box
<ul style="list-style-type: none"> - Issue only once 	<p>A process control message is set only once. If this setting is activated, the box "all nn intervals" cannot be operated.</p>

Box	Meaning
<p>- Issue all nn Monitoring Cycles</p>	<p>You are prompted to enter a value nn for the frequency of process control alarm messages (or to accept the default value). This value is precalculated in each case from the specified synchronization interval. In the event of a continuous malfunction (for example, "Cannot transmit time message frame"), the value is to be interpreted such that an appropriate message is transmitted only every x monitoring cycle. You now have the infinitely adjustable input capability in a range of values that, when converted, always has a frequency between approximately one minute and one hour. The default value is always calculated to give a frequency of approximately one minute.</p> <p>Example: A synchronization interval of 30 sec was set and the alarm message interval to 4 monitoring cycles (1 Monitoring Cycle = 4 x Synchronization Interval). The DCF77 signal quality falls beneath the permitted value. The master immediately sends the corresponding process control system message. If the signal quality remains poor, the next alarm message is not transmitted until the fourth subsequent monitoring cycle, that is, after approximately 8 minutes. If the signal quality improves again, an internal message counter is reset. The message cycle begins again the next time the signal is bad.</p> <p>The following context applies for the slaves: The checking period for the time messages always corresponds to 4 times the synchronization time set. This results in a time span of min. 4 to max. 8 synchronization intervals until a possible error message is displayed.</p> <p>Example: The synchronization interval is set to 15 sec. This results in a monitoring period of 4 x 15 sec. If, e.g. no more time message is received after 2 x 15 sec, another 2 x 15 sec pass until the check is performed. Since the messages have arrived during the first two intervals, TimeSync declares synchronization valid. During the next checking period of 4 x 15 sec, no more time messages are received and synchronization is invalid. In this case, the corresponding alarm message is displayed after 6 x 15 sec, that is, after 1.5 checking cycles.</p>

8.5 Dialog "DCF77 Receive" Service"

The DCF77 long-wave transmitter broadcasts time information in coded form at frequency 77.5 kHz. Because of its central location in Central Europe and its extensive range (up to 2000 km), this transmitter is significant far beyond Germany. The time information that is broadcast is picked up by the two atomic clocks CS1 and CS2 of the "Physikalisch-technischen Bundesanstalt" in Mainflingen near Frankfurt, Germany, and represents the official time according to the Time Law of 1978 of the Federal Republic of Germany. The time corresponds to Central European Time (CET) or Central European Daylight Saving Time (CEDST) and is derived directly from the internationally established time scale UTC (Universal Time Coordinated):

CET = UTC + 1hr or CEDST = UTC + 2hr

Note

For the connected DCF77 receiver or the connected GPS receiver, the "DCF77 Receiving Service" V1.x or higher must be used. Version information can be displayed by clicking on the "Info" button in the "DCF77 Receiving Service" dialog.

You can use the object DCF77 in the Windows Control Panel to assign parameters to time synchronization. To open the necessary dialog, proceed as follows:

1. In the Windows taskbar, click on "Start".
2. From the menu items "Settings" and "Control Panel" open the "Control Panel" folder.
3. In the "Control Panel" folder, double click on the object "DCF77" to open the dialog window "DCF77 Receive Service."
4. In this dialog window, you can make all the necessary settings.

Structure of the Dialog Window:

Box	Meaning
Signal Source	This box displays the entry "Serial" by default. You cannot edit this box.
Port	Indication of the COM interface to which the external DCF77 or GPS receiver is connected. The recommended default is COM2.
Signal Shape	This box displays the entry "DCF77 demodulated" by default. You cannot edit this box.
Time Zone	In this selection field, the time zone is specified. The following time zones can be set: UTC, Local Time or CET/CEST.
Checking the CET/CEST Time Zone	If activated, the time zone setting CET/CEST in the Control Panel is checked. The result is recorded in the event report. If a different time zone is set in the Control Panel, the check will not be performed.
Suppress Synchronization	When this check box is activated, synchronization of the system time is suppressed.

Box	Meaning
Balance Deviations Smoothly	When this check box is activated, the system time is adjusted to the current time smoothly, as long as the deviation is under the maximum value permitted ("tolerance"). For this to be accomplished, the internal passage of time is either slowed down or speeded up a maximum of 1 ms per 1 s or 60 ms per 1 min.
First update after	Indicates how many correctly decoded time message frames must occur before the system time should be updated. The unit of measurement for this box is "Minutes".
Update Interval	Indicates how many time message frames (= minutes) must occur following the initial update before a renewed comparison to the system time or, where appropriate, a correction of the system time is made.
Permitted Deviation	Indicates the maximum time difference permitted (in milliseconds) until an update of the system time is made.
Event Report	If you are using Windows NT 4.x, the events are kept directly in the event report. You can open this event report as follows: in the taskbar, click on "Start". Then select the menu items "Programs", "Administration (General)", and "Event Display".
- Time Comparisons	If the check box is activated, all time comparisons will be entered in the event report.
- Every Valid Time Message Frame	If the check box is activated, every valid time message frame will be entered in the event report.
- Changes in Signal Quality	If the check box is activated, every change in signal quality will be entered in the event report.

9 Storage

If you selected the option package "Storage" during the user-defined installation of WinCC, you will be able to use the archive functions of the WinCC system.

9.1 General Information

The archive functions support the automatic swapping of data from the hard disk to long-term data carriers as well as the deletion of data from the hard disk.

The automatic archiving can be controlled by two factors:

- Time-controlled archiving triggered by a specified date or time
- Fill level-controlled archiving triggered by the fill level of the storage medium

Note

During archiving, a serious restriction is caused by the Sybase database. Swapping out data records does not actually delete them from the database, instead they are merely marked for reuse database-internally. As a result, the database as well as the space occupied on the monitored drive never become smaller.

Consequence: Once the permitted fill level has been reached or exceeded, Storage will not be able to exit the operating mode "Fill Level-triggered Archiving". To return to the normal operating mode "Time-triggered Archiving", the entry for the permissible fill level must be increased or other not required data be deleted from the drive.

In reality, the condition of an imminent overflow of the drive is usually caused by an error - such as fill data carrier, no connection to the archiving drive, etc. - that prevents Storage from swapping out data.

Because of this, the action "Delete" is recommended for the monitoring of a drive.

During the automatic archiving, an archive server monitors the archive functions. The automatic swapping can be activated or deactivated.

Provided that the data is stored in sequential archives, the archive functions can be used to edit the following data types in the WinCC database:

- Alarms from "Alarm Logging"
- Measured values from "Tag Logging"
- Reports from the "Report Designer"

In addition to the automatic archiving of your data, the archive functions can be used to perform two types of manual swapping:

- Manual swapping forcing the swap of all stored data carriers.
- Via the "Export" tab, individual data and time ranges can be exported manually. In this case, the data will be copied and not be deleted from the database.

Note:

Data that is stored in cyclic archives cannot be edited with the archive function!

If the swap to a data carrier is incomplete, the following process control message will be output the next time the system is started:

"Swap could not be completed".

Saving the Configuration

Changes made to the individual tabs of the "Storage" configuration dialog have to be saved in every tab by clicking on the "Apply" button, otherwise they will not be accepted and be discarded.

Accessing the "Storage" User Interface in WinCC Runtime

To access the user interface of the "Storage" application via user-defined buttons in WinCC runtime, an operator action script with the following formulation has to be configured: ProgramExecute ("archive.exe").

This selection has already been made on the system-side, if the "Alarm Logging Wizard" and the "Split Screen Wizard" are used to generate the base data.

Manipulating the Data Carriers

A change to the swapping data carrier by applications other than "Storage" is not permitted. Manipulating data carriers, such as the deletion/creation of swapping folders or "ini" files, is not permitted. In such a case, correct operation is not guaranteed.

Overwriting old, swapped Data

If another version of the project data is accessed (e.g. backup), the project environment (data carrier, drive settings, ...) must be matched as well.

This means: If a project at a certain configuration stage has swapped data in runtime, it forms an inseparable unit with this data and the corresponding data carrier. A mixed operation with data and data carriers from different project versions is not permitted.

Example:

A project is created and saved as a backup. The project is activated, generates data and swaps this data, while you continue the configuration with the backup. Later you replace the original project with the project that has been configured further.

Data-technically you now have two different projects, even though the project name has not been changed. The data carriers already written to belong to the original project and may only be swapped back in there. It is best to secure the complete project on an additional data carrier and to mark and store all data carriers as a related unit. Without affecting the running process operation, this old project version can - at any time - be copied to any computer with the corresponding WinCC version and swapped (out) data be swapped back in again as well.

As soon as the further configured/changed backup is activated, it starts generating new data, which will then be swapped. In this case, the data carrier and the swapping folders are numbered continuously beginning with 1, as has been done earlier with the original project. The new swappings with the new data carriers are part of the new project and may only be swapped back in there.

If - for configuration purposes - you make no backup of a project that swaps data, then the running project continues to generate and swap data while you work, and in the end, you would have 3 data-technically different projects. Inconsistencies in the data storage would arise, since the running project would have progressed further with the data carrier and swapping count than your modified project.

Storage in a redundant System

If during the redundant operation each server performs separate swappings, the data carriers from one server may not be used on the other server, neither for swapping (out) nor for swapping back in. The data carriers must be labeled differently. A unique and reasonable identification is the responsibility of the user.

Example:

First Redundant Server Pair = Burner1_a / Burner1_b , Second Redundant Server Pair = Burner2_a / Burner2_b .

If servers are deactivated for different times during the redundant operation, the data carrier and swapping counts may have different values, i.e. one server may have used more data carriers than its partner.

The Storage Capacity of the Swapping Medium is insufficient

If, after a failure, even an empty swapping medium does not have sufficient storage capacity due to the large amount of data accumulated, proceed as follows:

- In the "Storage" dialog box, deactivate the automatic (button located in the first tab).
- Lock the data carrier (button in the second tab) and remove it from the drive.
- In the "Storage" dialog box, define another drive (local hard drive or network hard drive), setup the data carrier and reactivate the automatic. Wait for the large data package to be swapped and then wait until the following regular swapping has been completed as well. The "CSV" files should then have their usual size again. Only the after the second correct/normal swapping, will the failure be corrected. Without this additional swapping, "Storage" would overestimate the required space on the data carrier, which could lead back to the initial state.
- In the Windows Explorer, transfer the data 1:1 from the replacement drive to a properly sized medium such as a Jazz drive. Appropriately label this data carrier.
- In the "Storage" dialog box, select the initial drive again, load a new data carrier and set it up.

When triggered the next time, "Storage" will swap properly again.

These steps ensure that the continuous, automatic assignment of data carrier numbers remains intact.

9.2 Bringing Storage from the Background to the Front

If Storage is employed without the process control options (Basic Process Control), you may not be able to move back the Storage dialog from the background to the foreground. Use the call parameter "/o" to keep Storage permanently in the foreground. A script call from Storage with the "/o" parameter could look as follows:

```
#include "apdefap.h"
void OnLButtonDown ( char* lpszPictureName,
char* lpszObjectName,
char* lpszPropertyName,
UINT nFlags, int x, int y )
{
    ProgramExecute( "archive.exe /o" );
}
```

This procedure is not necessary with the Basic Process Control or PCS7. In there, the Storage dialog is accessed via a ready-made button.

9.3 The Archive Server

In order for the archive server to monitor the archiving in an activated WinCC project, the server must be added to the startup list of the computer.

Archive Server States

Each of the four Storage tabs will display the following archive server states in the status bar at the bottom left:

- "Ready": The archive server is running and monitoring the automatic archiving.
- "Ready (offline)": The archive server is properly running and monitoring the automatic archiving; the client, however, cannot establish a connection to the server. The client, therefore cannot control or influence the server. To correct the network error with the message "Ready (offline)", it is recommended to exit Storage and then start it again.
- "Server not running": Errors occurred while the archive server started up. This means you have only a limited access to the archive functions.
- "Time-controlled Data Export": The archiving takes place in a time-controlled manner and the archive server swaps data to the archiving drive.
- "Data Export - Limit Value of the Hard Drive Fill Level has been exceeded": The maximum permissible fill level has been reached on the hard drive. As an emergency measure, all data "older than" will be deleted or – if configured – swapped out and then deleted.
- "Data Export triggered manually": Data is exported manually from the database.
- "Wait for Retry": An error occurred during the last archive access. The archive server issued a process control system message. After the wait time - set during the configuration - has expired, a new archiving attempt is made. While in this state, a manual "swap", "swap back" or "export" is not possible even if the automatic has been turned off.
- "Startup of the Archive Server": This message is displayed if you start the archive server while the archive dialog is open.
- "Data Export to File": This message is displayed if a data export is initiated in the "Export" tab.
- "Data Import": Data is being swapped in.
- "Data Carrier is being prepared": This message is displayed while the data carrier is being set up.
- "Error Correction during Startup": An error occurred while swapping causing the project to be deactivated. If the project is reactivated, the archive server will detect that the previous swapping was not completed properly and attempts to correct the error.
- "Project not in Runtime": The project has not been activated.

Automatic Swapping

The automatic swapping is activated/deactivated in the "Configuration" tab using the "Activate" or "Deactivate" buttons. The current active/inactive status of the archive server is displayed at the bottom right of the "Storage" dialog box:

- Automatic active
- Automatic inactive

9.4 The "Configuration" Tab

In the "Configuration" tab, the settings for the automatic swapping of data from the WinCC runtime database to a data carrier are made. In the "Repetition" area, the settings for the time-controlled archiving (swapping) are made. In the "Disk Monitoring" area, the settings for the fill level-controlled archiving (swapping) are made.

Both archiving types can be configured independently of each other.

The time-controlled archiving is preferable to the fill level-controlled archiving. With the fill level-controlled archiving, the permitted fill level set for a drive can be reached not only by a growing WinCC runtime database, but also by any files that are saved on this drive.

Notes regarding the Configuration of Intervals for the time-controlled Archiving

The swapping intervals in the "Configuration" tab should be set as small as possible (Hour Range), since swapping data back in reduces the memory available to runtime and increases the system load.

However, if too many swappings take place due to very short time intervals (e.g. 1 hour), the navigation in the log ("Swapping Back" tab) is made more difficult.

During a swapping operation, the system experiences additional loads which can lead to reduced reaction times.

Recommendation: A daily data swap at a time when the system load is low.

Field	Description
Automatic	Specifies whether the automatic archiving is activated or deactivated. This functionality is available in an activated WinCC project.
Repetition	Settings for the time-controlled archiving.
Start	Specifies the starting time for an action. By selecting the day, month, year, time and using the arrow buttons, the date as well as the time can be set.
every	Time interval of the archiving function, e.g. every two hours.
Action	Three actions to be performed are offered: "Swap", "Delete" or "No Action". For each data type (alarm, tag - measured value, report), one of the three actions can be selected independent of each other. Swap: The data is first swapped to the data carrier and then deleted from the WinCC runtime database. Delete: The data is deleted from the WinCC runtime database. No Action: No action is being performed.
Disk Monitoring	Settings for the fill level-controlled archiving.

Field	Description
Monitored Disk	Indicates the network path using the Universal Naming Convention (UNC). The network path is composed of the "\\Computer Name\"Project Name". For each new WinCC project, a new folder is created and enabled in the project folder. The folder name will be preceded by the prefix "WinCC50_Project_". Thus, the monitored disk is the one on which the current project folder is located.
Current Fill Level	Current fill level of the drive on which the current WinCC project has been created. Example: If the drive on which the project has been installed has a total capacity of 4 GB and 1.52 GB are currently occupied, then a current fill level of 38% will be indicated.
Permitted Fill Level	In this field, the fill level of the drive on which the current project has been created can be limited. If the specified fill level is reached or exceeded, an automatic swapping or deletion of the accumulated data can be triggered. Due to the condition pertaining to the fill level-triggered archiving detailed in the above note, the action "Delete" is recommended.
Action	If the permitted fill level is exceeded, one of three actions can be performed: "Swap", "Delete" or "No Action". For each data type (alarm, tag - measured value, report), one of the three actions can be selected independent of each other. Swap: The data is first swapped to the data carrier and then deleted from the WinCC runtime database. (Is not recommended.) Delete: The data is deleted from the WinCC runtime database. (Is recommended.) No Action: No action is being performed. (Is not recommended.)
Data older than	Specifies the minimum age of the data to be edited by the archive function.
In case of faulty archiving, repeat every	Specifies the waiting time between two archiving attempts (if the previous attempt has failed).
Archiving Drive	Name of the drive used for archiving purposes.
Label of the Data Carrier	Name of the data carrier.
Print	Prints out the values set in the "Configuration" tab on a connected printer.
Preview	Shows a print preview of the values set in the "Configuration" tab.
Archive Server Status (Status Bar)	Indicates the status of the archive server. The various states are described in "The Archive Server" section.
Connection Status (Status Bar)	Indicates the status of the connection to the archive server. Two states can be displayed: "No Connection to the Server" or "Connection has been established".
Automatic Status (Status Bar)	Indicates the status of the automatic swapping. Two states can be displayed: "Automatic Deactivated" or "Automatic Activated".

Field	Description
Apply	The "Apply" button will only be enabled if changes are made in the "Configuration" tab. Clicking on the "Apply" button will make effective all changes made.

9.4.1 Activating or Deactivating the Automatic

The automatic swapping is activated or deactivated by the "Activate/Deactivate" button. If the automatic is deactivated, no automatic swappings will be performed. However, the actions of the archive server are still available, such as setting up a data carrier, manual swapping, swapping back in, exporting, etc. The dialog tabs display the current status "Automatic Deactivated" or "Automatic Activated" of the archive server.

9.4.2 The Archiving Drive

Archiving can only be executed on data carriers that are accessible as drives under Windows and that allow reading and writing of files. The selection field lists all local and network drives.

Note:

The archiving drive should only be used for archiving. Otherwise, conflicts could arise, especially during automatic archiving. If the archiving function recognizes an incorrect data carrier, it will not run the automatic archiving.

If STORAGE is employed together with REDUNDANCY and the archives are to be swapped to a common, third computer, the archiving drive specified for the two redundant computers must not, under any circumstances, be the same drive.

For client/server projects, the archiving drive must be a mapped network drive and entered following the Universal Naming Convention (UNC), e.g. "\\computername\enablename".

9.4.3 Label of the Data Carrier

When a new data carrier is created, it receives a unique name. This name consists of two parts. The first part of the name can be changed. As the default name, "SIMATIC CONTROL" is suggested. The second part of the name is a 4 digit number that is assigned by the system.

9.4.4 Time-controlled Archiving

For the "Time-controlled Archiving", the following has to be specified:

Start Time:

Specifies the time at which the archive function is to process the data for the first time.

When specifying the start time, the date and time are entered in this format:

Date: Day - Month - Year

Time: Hours in 24/12 Format - Minutes

Repetition Time:

Specifies the time intervals at which the archive function is to be active. If the cycle time is zero, the archive function will only be executed once.

Action:

For all data types, you can separately specify how the data is to be processed once the specified time is reached. It is possible to delete, swap or not process the data. All data meeting the criterion "Data older than" are processed by the selected action.

Note:

When performing an action, only full hours will be considered with regard to the age of the data. Example: In the configuration it has been specified that the data is to be processed until 9:45. In reality, however, the specified action will only be applied to the data that has been accumulated till 9:00.

9.4.5 Fill Level-controlled Archiving

For the "Fill Level-controlled Archiving", the following has to be specified:

Fill Level:

The archive function is executed when the disk fill level of the disk being monitored exceeds the specified percentage. For your information, the current disk fill level is displayed as well.

Action:

For all data types, you can separately specify how the data is to be processed once the specified fill level is reached. It is possible to delete, swap or not process the data. All data meeting the criterion "Data older than" are processed by the selected action. Note particularly that when deleting, this can lead to an undesired loss of data, since all data meeting the criterion "Data older than" will be deleted once the specified fill level is exceeded. Fill level-controlled monitoring should only be used to prevent a hard drive overrun and thus a WinCC crash. This method is not suitable for cyclic actions!

Note:

When performing an action, only full hours will be considered with regard to the age of the data. Example: In the configuration it has been specified that the data is to be processed until 9:45. In reality, however, the specified action will only be applied to the data that has been accumulated till 9:00.

9.4.6 Data older than

The offset specifies how old the data must be in order to be processed by the archive functions.

9.4.7 Retry

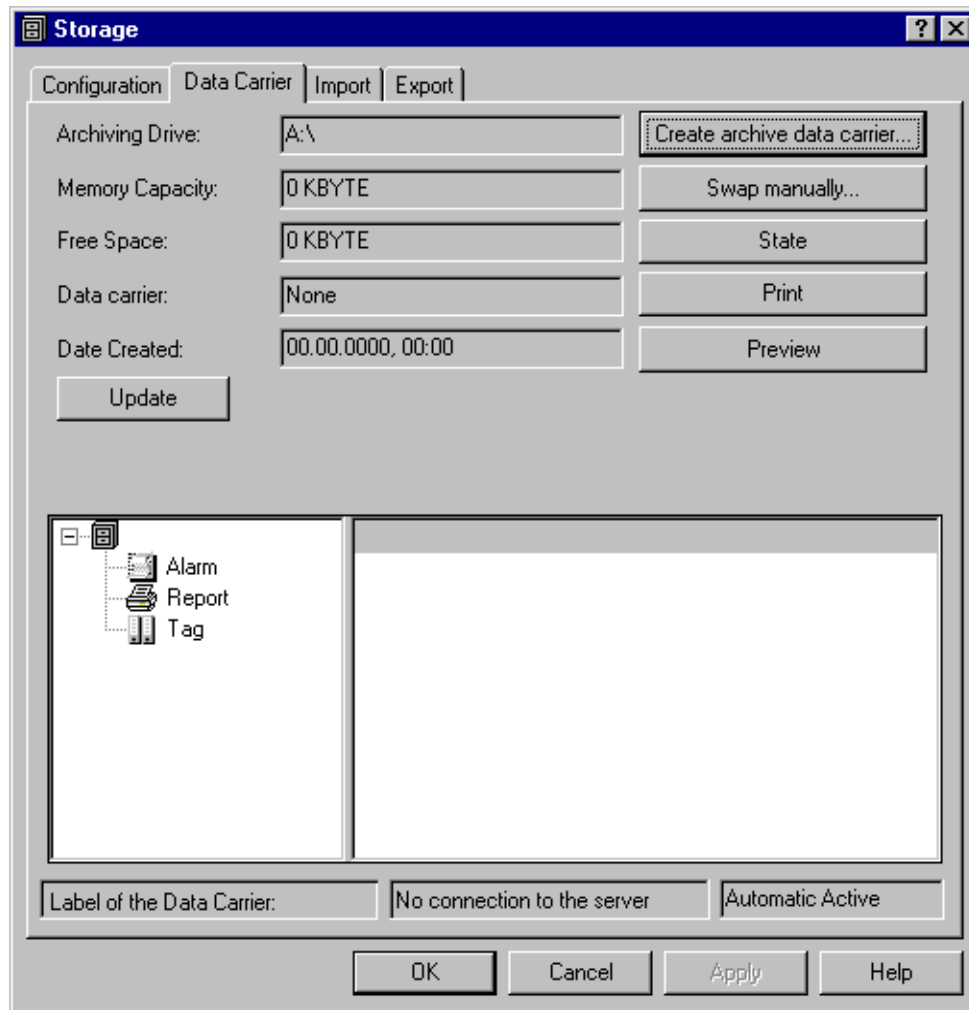
If the automatic archiving failed because there was insufficient space on the archive data carrier or because there was either no data carrier or an invalid data carrier in the drive, a process control message will be issued. After the time specified in here has expired, the system will attempt to execute the automatic archive function again.

If you enter a zero in the field "In case of faulty archiving, repeat every n minutes", no retry attempts will be made in the event of a failed archiving.

9.5 "Data Carrier" Tab

To preparation for the archive function, the data carrier name and the creation date are written to the data carrier. This task is performed by the "Create Archive Data Carrier" function, which is accessed in the "Data Carrier" tab.

Previously used data carriers can be employed to archive additional data. A data carrier can also be locked to prevent the swapping of additional data.



Field	Description
Archiving Drive	The drive used for archiving purposes.
Storage Capacity	Displays the maximum storage capacity of the data carrier loaded in the archiving drive.
Free Space	Displays the free storage capacity of the data carrier loaded in the archiving drive.
Data Carrier	Name of the data carrier loaded in the archiving drive.
Date	Displays the creation date of the data carrier loaded in the archiving drive.

Field	Description
Update	Rereads the data carrier that is loaded in the archiving drive. If changes are made in a tab, they will only be displayed in the other tabs after clicking the "Update" button.
Create Archive Data Carrier	Creates a new archive data carrier. An archive data carrier can be created once the project has been activated. In addition, the archive server has to be ready and the connection be established. The states of the archive server, the connection and the automatic are displayed in the status bar of all storage dialog tabs.
Swap manually...	This function is used to force the swapping of stored data.
Lock	Locks the archive data carrier - no additional swappings will be placed on this data carrier.
Print	Prints out the values set in the "Data Carrier" tab on a connected printer.
Preview	Shows a print preview of the values set in the "Data Carrier" tab.
Archive Server Status (Status Bar)	The various states are described in "The Archive Server" section.
Connection Status (Status Bar)	Two states can be displayed: "No Connection to the Server" or "Connection has been established".
Automatic Status (Status Bar)	Two states can be displayed: "Automatic Deactivated" or "Automatic Activated".
Apply	The "Apply" button will only be enabled if changes are made in the "Data Carrier" tab. Clicking on the "Apply" button will make effective all changes made.

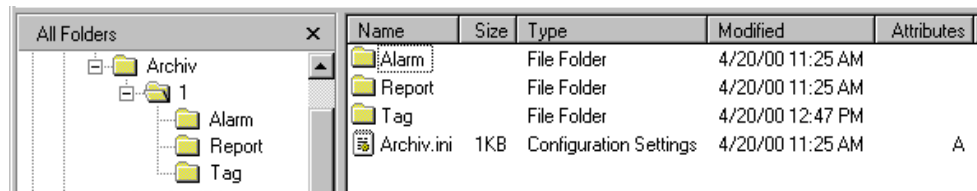
Creating the Archive Data Carrier

In general, the following applies: The changing of swapped files or the "Archive.ini" files is not permitted.

When creating a new archive data carrier, the folder "Archive" and the file "Archive.ini" will be generated in the archiving folder.

For the first swapping, the subfolder "1" will be created in the archiving folder. Depending on the action selected (alarm, tag - measured value, report) in the storage dialog, a corresponding subfolder named alarm, tag (measured value) or report and an additional "Archive.ini" file (differing from the main folder) will be created. In the alarm, tag (measured value) or report folder, the swapped data will be stored.

If the generated archiving folder is selected from the Windows Explorer, it can have the following structure.



Additional information about swap files can be found in the chapter "Swap Files".

9.5.1 Data Carrier

This field provides you with information about the data carrier loaded on the archiving drive. The following displays are possible:

- "No data carrier in archiving drive": The "Storage Capacity" and "Date Created" fields remain blank, and "No data carrier" is displayed as the data carrier name.
- "Unformatted data carrier in archiving drive": The "Storage Capacity" and "Date Created" fields remain blank, and "No data carrier" is displayed as the data carrier name.
- "Blank data carrier in archiving drive": A data carrier without data carrier information is in the archiving drive. The storage capacity and the available space are determined. The "Date Created" field remains blank, and "Blank data carrier" is displayed as the data carrier name.
- "Foreign data carrier in archiving drive": The storage capacity and the available space are determined. The "Date Created" field remains blank, and "Invalid data carrier" is displayed as the data carrier name.
- "Archive data carrier in archiving drive": The storage capacity and the available space are determined. The data carrier name and the date created are read from the data carrier and displayed.

9.5.2 Navigation and Data Window

The bottom part of the "Data Carrier" tab contains information about the data stored on the data carrier.



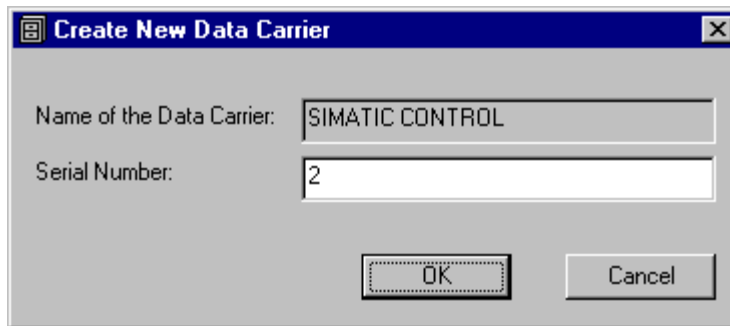
The root of the navigation window contains the project name. The nodes represent the types of data, e.g. alarm (messages), report and tag (measured values). The data window displays the corresponding files in list form with the date and the file size in KB.

9.5.3 Creating the Archive Data Carrier

After calling the "Create Archive Data Carrier" function, the system requests that you load a new data carrier.

Depending on the type of data carrier loaded, one of the following messages will be displayed:

- "No data carrier in archiving drive": The creation of a new archive data carrier is canceled and the message "Unsuitable data carrier in archiving drive" is displayed.
- "Unformatted data carrier in archiving drive": The creation of a new archive data carrier is canceled and the message "Unsuitable data carrier in archiving drive" is displayed.
- "Foreign data carrier in the archiving drive": The creation of a new archive data carrier is canceled and the message "Unsuitable data carrier in archiving drive" is displayed.
- "Archive data carrier in archiving drive": The creation of a new archive data carrier is canceled and the message "Unsuitable data carrier in archiving drive" is displayed.
- "Blank, formatted data carrier in archiving drive": A dialog for the data carrier creation is opened. As a default, the name provided in the "Configuration" tab is used as the data carrier name. This name can be changed as desired. The four digit number is automatically assigned. The data carrier will be set up after assigning a valid name (or using the default).



Note:

This function can only be accessed, if the archive server monitors the archiving functions. This can be identified by the server status "Archive server running (ready)".

9.5.4 Locking the Archive Data Carrier

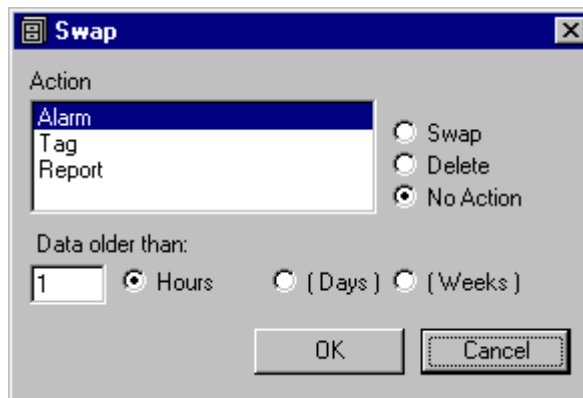
Previously used data carriers can be employed to archive additional data. A data carrier can also be locked via the "Lock/Release" button to prevent the swapping of additional data or a locked data carrier can be released again. Depending on the status, the button is labeled either "Lock" or "Release".

9.5.5 Updating

This function rereads the data from the data carrier that is loaded in the archiving drive. The data window is updated to display the "Data Carrier Name", "Date Created" and information about the space on the data carrier. If changes are made in a tab, they will only be displayed in the other tabs after clicking the "Update" button.

9.5.6 Manual Swapping

Use the "Swap manually..." function to force the swapping of data.



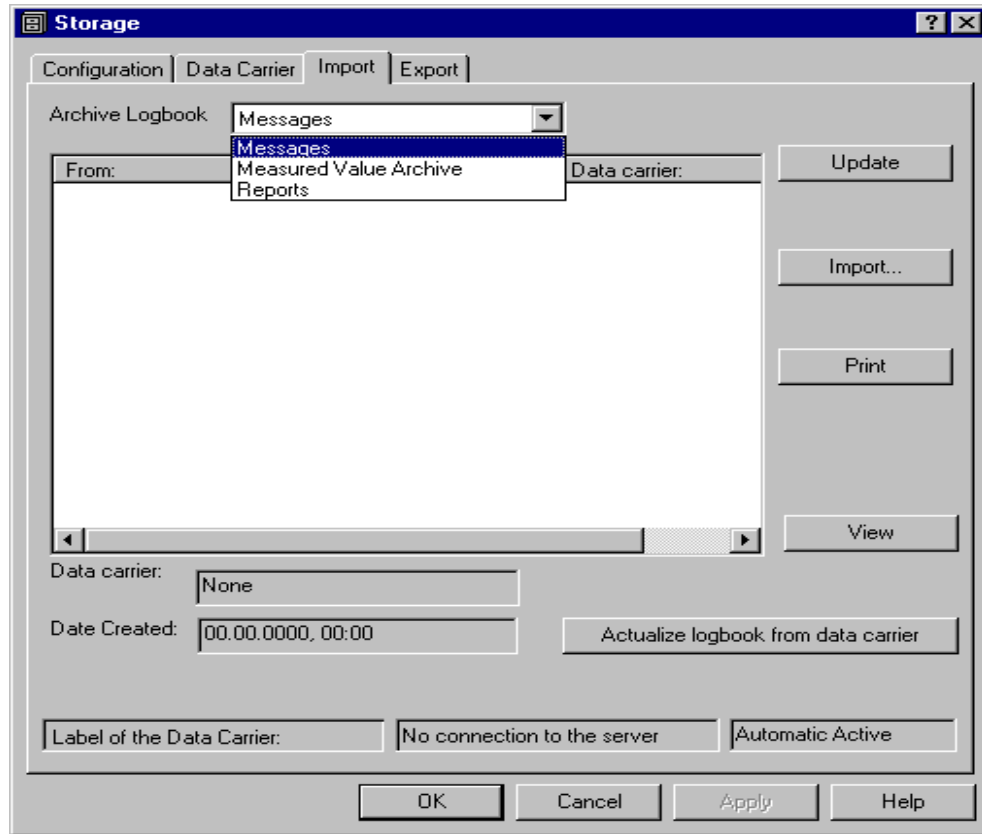
In the dialog window for the manual swapping, you can determine the manner in which the data is to be processed separately for each data type. Use the offset to determine how old the data must be in order to be processed by the "Swap manually..." function.

Note:

This function should only be used as an exception to the rule.

9.6 The "Swapping Back" Tab

Data that no longer is available from the WinCC runtime database - because it has been swapped out - can be swapped back in again. For this, special functions are available from the "Swapping Back" tab.

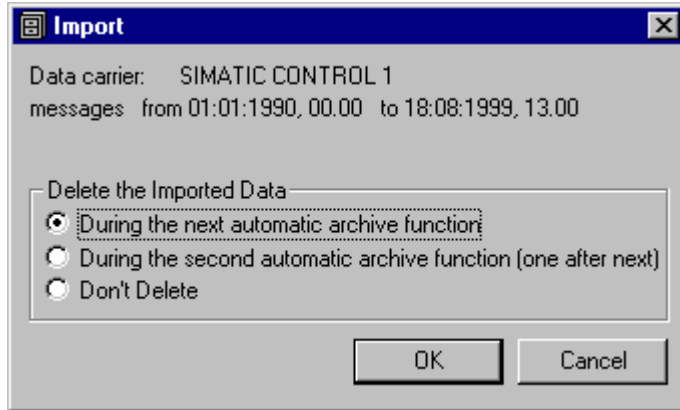


Field	Description
Archive Log	Provides information about the data that have been processed by "Storage". From this list-box, alarms, tags (measured value archives) and reports can be selected. To swap back in swapped out data, select the desired data type from the "Archive Log" list-box and the desired line from the display field (click on the "From" column). Then the swapping back process can be started by clicking on the "Swap Back" button.
Update	Rereads the data carrier that is loaded in the archiving drive. If changes are made in a tab, they will only be displayed in the other tabs after clicking the "Update" button.
Swap Back	Used for the manual swapping back of swapped out data. This function is only enabled if the archive server is active.
Print	Prints out the displayed data on a connected printer.
Preview	Shows a print preview of the displayed data.
Data Carrier	Name of the data carrier loaded in the archiving drive.

Field	Description
Date Created	Displays the creation date of the data carrier loaded in the archiving drive.
Update Data Carrier Log	Reconstruction of the log information of all swappings to an archive data carrier. The information is taken directly from the data carrier and written into the log. After a successful update, the following message is displayed: "Update of the Archive Data Carrier Log was completed successfully".
Archive Server Status (Status Bar)	The various states are described in "The Archive Server" section.
Connection Status (Status Bar)	Two states can be displayed: "No Connection to the Server" or "Connection has been established".
Automatic Status (Status Bar)	Two states can be displayed: "Automatic Deactivated" or "Automatic Activated".
Apply	The "Apply" button will only be enabled if changes are made in the "Swapping Back" tab. Clicking on the "Apply" button will make effective all changes made.

9.6.1 Swapping Back

Via the "Swap Back" function, data swapped to an archive data carrier can be swapped back into the WinCC runtime database.



In the selection field "Delete the Swapped Back Data" it can be determined if and when the data is to be deleted from the WinCC runtime database.

Radio-Button	Description
At the next automatic archiving function	The data will be deleted from the WinCC runtime database at the next automatic archiving function, but not from the data carrier.
At the second automatic archiving function	The data will be deleted from the WinCC runtime database at the second automatic archiving function, but not from the data carrier.
Don't delete	The data swapped back will remain in the WinCC runtime database. This option is not recommended, since the data can no longer be processed by "Storage".

9.6.2 Archive Log

In order to swap data - that has been swapped out - back into the WinCC runtime database, an archive log is kept for the data that has been swapped out automatically. This archive log documents on which data carriers the data is located. As long as the WinCC runtime database was processed by the automatic archiving function, the following information about the different data types can be obtained from the archive log:

- Time frame of the processed data.
- How the data was processed.
- Data carriers on which the data was stored.

The data carrier also contains all necessary information to update the log of the archive server.

9.6.3 Swapping Back Models

Manual Swapping Back

If you wish to view alarms in the alarm system that were already swapped out completely or partially, the alarm system will issue a message stating that the data is no longer in the database. The alarm system then cancels the selection.

Use the WinCC Explorer to start the archive application and select the "Swapping Back" tab. In the archive log, find the line with the correct time frame and load the appropriate data carrier in the archiving drive. Click on "Update" to display the contents of the data carrier. Then select the data that you are interested in from the desired time frame and start the swapping back process.

If the correct data carrier was loaded in the archiving drive, the swapping back process will begin. In this case, the files are imported into the WinCC database.

If the desired time frame is not all on one data carrier, the process has to be repeated several times.

After completing the data swap back, do not forget to reload the original data carrier into the archiving drive, so as not to disturb the automatic archiving function.

It is recommended to deactivate the automatic swapping during the manual swapping back process. This prevents an accidental storing of data.

In the alarm system, you can now select the desired time frame again and view the swapped back data.

Reconstructing the Data Carrier Log

In order to swap back the data on a data carrier, the data carrier must be registered in the log. If swapping back is required and the entry for the data carrier is missing in the log, there is the possibility of updating the log via the data carrier.

To do so, click on the "Update Data Carrier Log" button. This will initiate the reconstruction process. After the log has been updated, the swapping back process can be carried out.

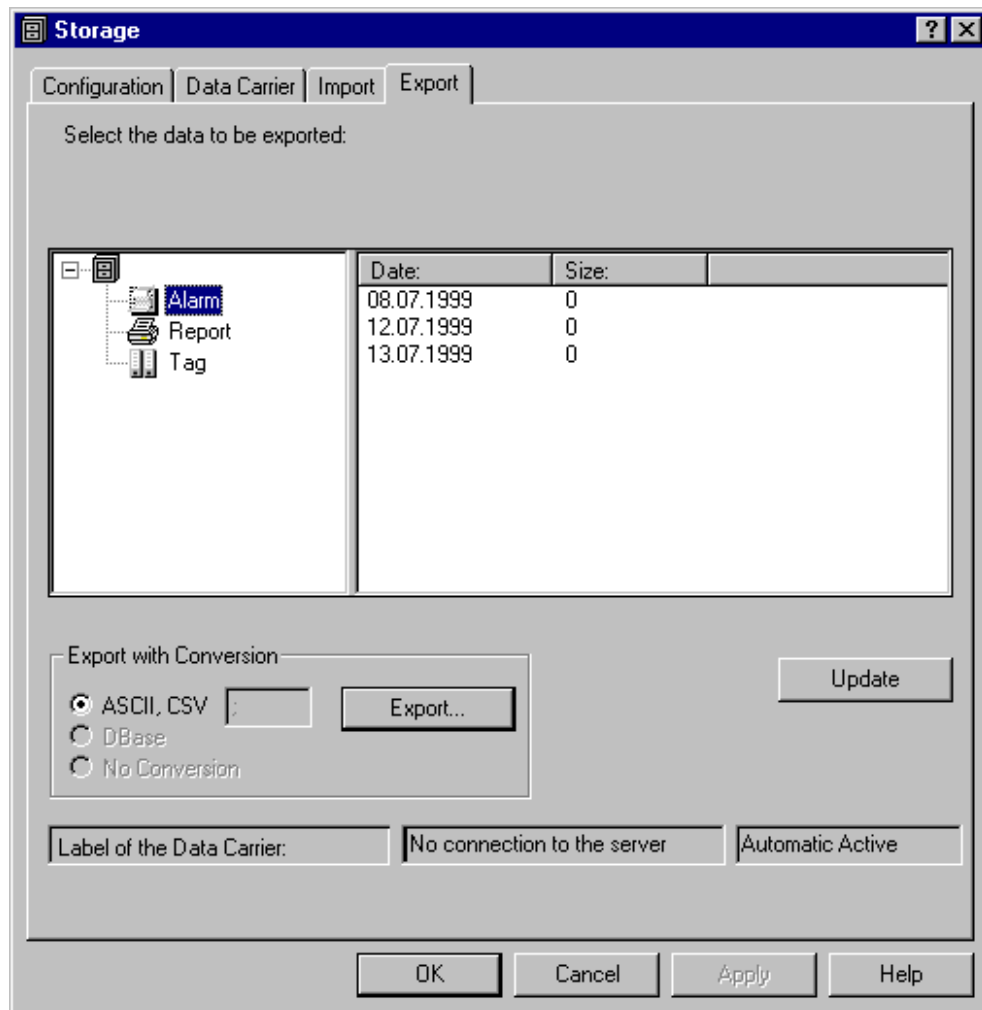
9.7 "Export" Tab

In the "Export" tab, settings are made to store data (alarms, tags - measured values, reports) on any medium such as hard drive, floppy disk, tape drive, etc. Unlike with the automatic and manual swapping, only a copying of the data, not a swapping or deletion, is possible.

Alarm and measured value data is exported converted to the ASCII CSV format. Report data is exported without conversion.

Note:

The "Export" tab will only be displayed if the WinCC project has been activated.

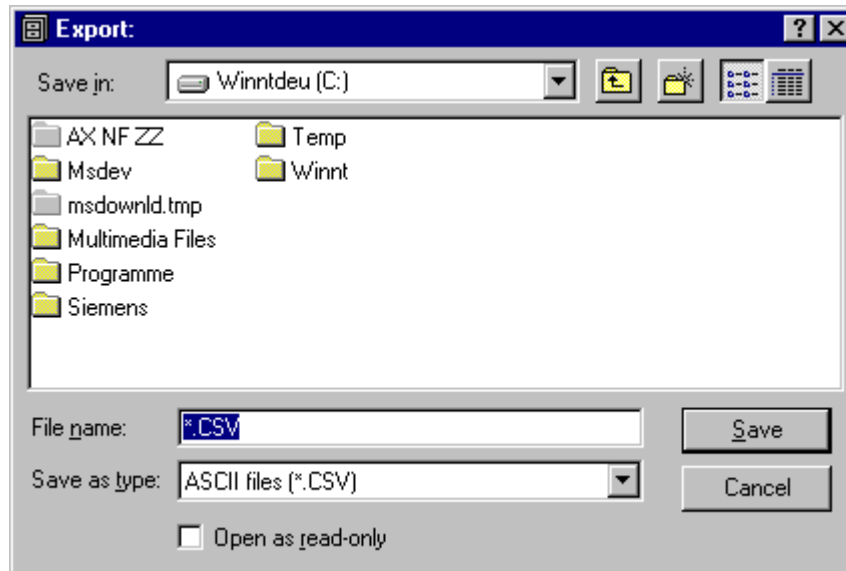


Field	Description
Select the Data to be exported	<p>The root of the navigation window contains the project name. The nodes represent the types of data, e.g. alarm (messages), report and tag (measured values). In the data window, the corresponding data including the name, time frame and file size in KB is displayed. The data displayed originates from the WinCC runtime database.</p> <p>In the data window, the data record to be exported is selected (only one data record at a time can be selected). The export can then be initiated by clicking on the "Export" button. The export format is preset automatically.</p>
Export with Conversion	The export format used to store the data to a drive is preset automatically.
Update	Rereads the data carrier that is loaded in the archiving drive. If changes are made in a tab, they will only be displayed in the other tabs after clicking the "Update" button.
Archive Server Status (Status Bar)	The various states are described in "The Archive Server" section.
Connection Status (Status Bar)	Two states can be displayed: "No Connection to the Server" or "Connection has been established".
Automatic Status (Status Bar)	Two states can be displayed: "Automatic Deactivated" or "Automatic Activated".
Apply	The "Apply" button will only be enabled if changes are made in the "Export" tab. Clicking on the "Apply" button will make effective all changes made.

9.7.1 Export

With the "Export" function, data from the WinCC runtime database can be copied and saved in predetermined file formats.

After selecting a data line and activating the "Export" function, the following dialog is displayed. In this Windows standard dialog, specify under which file name and on which drive the data is to be stored.



9.7.2 Conversion Format

The conversion format specifies in which format the selected data line is to be stored on a drive.

Note:

You cannot convert reports from the Report Designer.

Currently, the data can only be stored in ASCII CSV (Comma Separated Value) format.

Archives that are to be processed further by Excel cannot exceed a certain size: Excel, Version 8, (Excel'97) can only read in archives containing a maximum of 65535 entries and Excel, Version 7, archives containing a maximum of 32767 entries.

Example:

With an archiving cycle time of 1 second, an archive will have 86400 entries after one day (60 sec * 60 min * 24 h). This archive is too large to be processed by Excel.

9.8 The Configuration File "ARCHIVE.CFG"

The "ARCHIVE" Folder

When creating a new WinCC project, the "ARCHIVE" folder is created in the project folder. The "ARCHIVE" folder will also be automatically created when projects from older WinCC versions are opened for the first time.

The Configuration File "ARCHIVE.CFG"

The configuration file "ARCHIVE.CFG" must be located in the "ARCHIVE" folder. "ARCHIVE.CFG" allows numerous "Storage" settings to be made. The "ARCHIVE.CFG" file can be created with a text editor. A text editor, for example, can be called in the Windows Explorer by clicking on the "File - New" menu and then selecting "Text File".

The "ARCHIVE.CFG" file provides an interface for setting the "Storage" parameters, which can otherwise only be changed in the registry. In addition, by linking this file to the project, all customer-specific settings are transferred to each computer onto which the project is loaded.

When runtime is started, the entries in the registry and the ARCHIVE.CFG file are checked simultaneously. In this case, the ARCHIVE.CFG file has a higher priority and determines the values transferred to the archive server.

Structure of the Configuration File "ARCHIVE.CFG"

The configuration file "ARCHIVE.CFG" must begin with the expression "[Archive-RT]". Each line contains a keyword, followed by the equal sign and a numerical value (in decimal format). A blank space must precede and follow the equal sign. A typical configuration file looks as follows:

Typical Configuration File "ARCHIVE.CFG"
[Archive-RT] CalculateRequiredSizeForExport = 1 SplitJobInterval = 180 WaitBetweenSplitJobIntervals = 250 WaitBeforeStartup = 500

If entries are missing in the "ARCHIVE.CFG" file or the "ARCHIVE.CFG" file is missing completely, WinCC will fall back on the internal settings (with meaningful values). Therefore, when in doubt, entries in the "ARCHIVE.CFG" file should be omitted.

Note:

All numerical entries must always be in a decimal format. Negative numbers are permitted.

Entries in the Configuration File "ARCHIVE.CFG"

The entries listed in the following table can be made in the "ARCHIVE.CFG" file. The preset default values are listed in the "Value" column. All entries are based on 32-Bit tags - this permits maximum values of up to 4 times 10 to the power of 9 = 4 billion. Additional information can be found following this table.

Entries in "ARCHIVE.CFG"			
No.	Entry	Value	Explanation
1	Calculate Required SizeFor Export	0	<p>Forces the determination of the required storage space for swapping.</p> <p>"1" = Forces the calculation of the required storage space prior to each pending swapping and compares it with the space available on the data carrier. Determined is the actual storage space requirement plus a safety margin based on No. 2. A requirement for this is that "RequiredSizeForExport" is set to "0".</p> <p>"0" = No forced calculation of the required storage space is performed.</p>
2	Estimate Required SizeFor ExportBy History	150	<p>With this setting, a safety margin can be added to the computed value. This entry is specified in % (150% = calculated storage space + 50%). The requirement here is that the settings of 1 and 3 are "0" and that the percentage is within the "Trust Ratio" of setting 6.</p> <p>>100 = Safety margin in %. Calculation according to the description above.</p> <p>"0" = Function is deactivated.</p> <p>For additional information, see below</p>
3	Required SizeFor Export	0	<p>Specifies a fixed storage space. The space is specified in Bytes.</p> <p>> 0 = Storage space in Bytes. All other mechanisms for determining the storage space are deactivated.</p> <p>"0" = Function is deactivated.</p> <p>For additional information, see below</p>
4	RetryTime Before Delete	4294967295 Hex: (0xffffffff)	<p>This entry specifies if and when data which could not be swapped out due to an error should, instead, be deleted. This prevents an unnecessary growth of the database.</p> <p>"4294967295" = Data is never deleted.</p> <p>"0" = The pending data record is deleted immediately following an unsuccessful swapping attempt (alarms, tags - measurement values, reports).</p> <p>"1"... "X" = With this setting, a factor is specified by which the swapping cycle is to be multiplied. This entry is made in %, i.e. a factor of 0.5 is entered as 50.</p> <p>For additional information, see below</p>

Entries in "ARCHIVE.CFG"			
5	SplitJob Interval	30	Specifies the time periods in which an archive tag is to be deleted. This entry is specified in minutes. For additional information, see below
6	TrustRatio For Estimate ByHistory	5	Specifies the 'plausibility' when determining the required storage space. Value "1" = Time periods must have the same size. Value > 1, i.e. value = "5" => permissible deviation of max. 500% (5 times the time period). Value "4294967295" = All deviations permitted. For additional information, see below
7	WaitBefore Startup	30000	Waiting period in msec. before the archive server "ArchSrv.exe" is activated following the start of the WinCC runtime.
8	Wait Between Split Job Intervals	100	This parameter specifies the waiting period in msec. between two delete jobs of an archive. For additional information, see below

EstimateRequiredSizeForExportByHistory

Following a successful swapping, the storage space required on the data carrier is determined. This value will be used as the basis for the next swapping. For the next pending swapping, the swapping time period is compared to the previous swapping time period. For example: Same time period => same storage space requirement, double the time period => double the storage space requirement.

RequiredSizeForExport

It may be useful to set a fixed storage space with "RequiredSizeForExport" if the following applies:

- 1 Swappings are performed in very short intervals that under certain conditions vary greatly in size, but you still want to optimally use the data carrier. For this, it is recommended to specify a small value. In this case, the last swapping not fitting on the data carrier (swapping interrupted with process control message) is simply repeated on the next data carrier.
- 2 Long time intervals are swapped where a new data carrier is to be used for each swapping. For this, it is recommended to specify a large value, i.e. 99% of the selected data carrier's capacity. This entry ensures that only one swapping is placed onto a data carrier. In addition, an undesired second swapping is not started, since the data carrier no longer exhibits the required maximum capacity. As a result, the swapping time is reduced, since no double swapping is performed.

RetryTimeBeforeDelete**"-1" = Data is never deleted**

The data is buffered in the database until the error cause (e.g. full data carrier) is eliminated and swappings can resume properly. From this moment on, all accumulated swappings will be made up. If the error cause cannot be corrected, the database will grow until the fill level-controlled deletion process is triggered. If the fill level-controlled triggering has been configured inexpertly, the hard disk may overflow, which can lead to a loss of control and crash of WinCC resulting in an unintended loss of data.

"1"..."X" = Multiplication factor for the swapping cycle

With this setting, the data would be deleted after 0.5 times the swapping cycle should the error not be corrected in time. With a swapping cycle of 12 hours, the data would therefore be deleted 6 hours after the faulty start of the swapping!

Formula for calculating the delay

The delay of the start of the time counter with regard to the trigger time can be calculated using the following formula (only positive results are of significance!):

$$DTS = (n-1) * (\text{deletion time} + (\text{cycle} * (\text{factor} - 1)))$$

where:

DTS => delay of the time counter start with regard to the trigger time (minimum value) in hours

n => number of swappings which could not be completed

deletion time => the time required by Storage to delete the pending swapping; specified in hours

cycle => swapping cycle specified in Storage

factor => factor specified in the registry, as decimal number (e.g. 0.5)

SplitJobInterval

The entries "SplitJobInterval" and "WaitBetweenSplitJobIntervals" are used to specify into what size pieces the deletion procedure should split up the archive to be deleted (alarms / tags - measured values) and how long the pauses should be between the individual deletion jobs. The following example illustrates the functionality of "SplitJobInterval" and "WaitBetweenSplitJobIntervals":

Time period to be deleted = 6 h

SplitJobInterval = 60 min

The 6 h to be deleted are split into 6 equal parts of 60 minutes each; the length of the interruptions between deletion jobs is set with the "WaitBetweenSplitJobIntervals" entry.

TrustRatioForEstimateByHistory

Since the time intervals of previous swappings used for determining the required storage space can vary greatly, the user can influence the 'plausibility' of this comparison by means of this entry.

The differences in the time intervals could, for example, arise due to the fact that the computer was not in runtime for a period equal to a multiple of the swapping cycle.

WaitBetweenSplitJobIntervals

This function is used to give the PC time to process any other pending PC tasks.

The longer the selected time, the smaller is the effect of the deletion process on the performance of other applications.

For extremely long archives with many interruptions (24 h archives, interrupted every 30 minutes), excessively long interruptions considerably lengthen the overall deletion process.

ArchiveDriveLevel

This function specifies the percentage of the space that can be occupied on the currently active archive data carrier. If this value is exceeded, a corresponding process control message is output.

9.9 Archive Data Carrier Information

9.9.1 Swap Files

In the "Alarm" folder, files of the type *.csv (comma separated value), *.cmt (comments) and *.txt (text) can be stored. Not all three file types have to be present in this folder. The information pertaining to a message (one line in the message window) is distributed among these three file types.

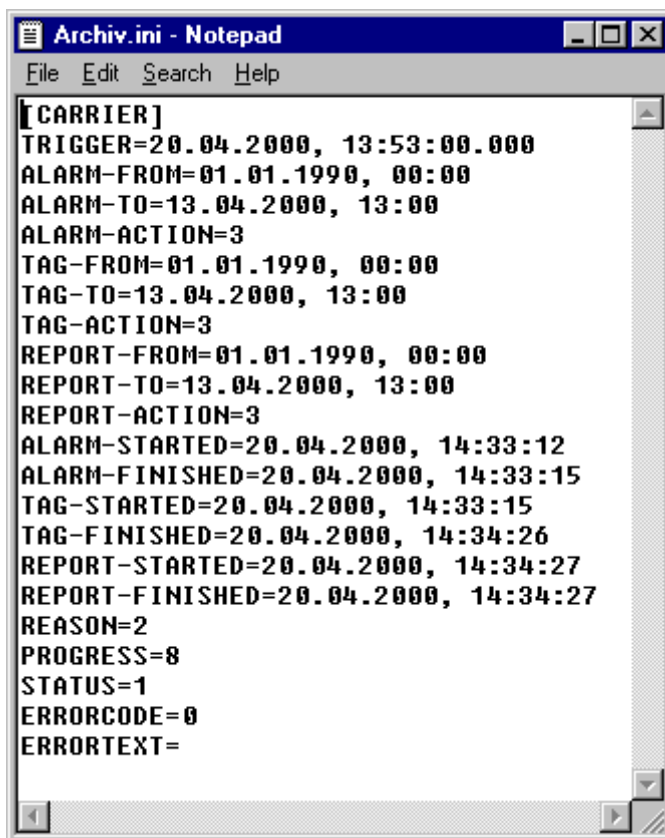
The "csv" file contains the actual message consisting of the date, time, summer/winter time identifier, internal message number, internal message counter and the process values from the database table. The cmt file contains the message comments as entered in the comments dialog of the message picture. The txt file contain the message's dynamic part. Example: Message Number 1010009, "The space occupied on the archive drive exceeds xxx%". The current numerical value is determined by the message-triggering application and is inserted at xxx in the message text displayed.

The "Tag" folder only contains files with the *.csv file extension. For each tag, a separate csv file exists. Its content is structured similarly to the csv files of the alarms: Date, time, summer/winter time identifier and the flags from the database table.

The "Reports" folder contains for example - depending on the configuration of the print jobs - shift reports. For each print job, a folder is created whose name consists of the date and the time. Depending on the report size, the folders contain one or more emf files. For example, a three-page report would be split into three emf files. To view "emf" files, WinCC supplies the "Documentation Viewer". The program "CCMetaView.exe" is located on the product CD-ROM in the folder "SmartTools\CC_MetaView".

The "Archive.ini" File in the Folder of the Current Swapping

The "Archive.ini" file with the current swapping number created in the folder typically looks as follows:



```

[CARRIER]
TRIGGER=20.04.2000, 13:53:00.000
ALARM-FROM=01.01.1990, 00:00
ALARM-TO=13.04.2000, 13:00
ALARM-ACTION=3
TAG-FROM=01.01.1990, 00:00
TAG-TO=13.04.2000, 13:00
TAG-ACTION=3
REPORT-FROM=01.01.1990, 00:00
REPORT-TO=13.04.2000, 13:00
REPORT-ACTION=3
ALARM-STARTED=20.04.2000, 14:33:12
ALARM-FINISHED=20.04.2000, 14:33:15
TAG-STARTED=20.04.2000, 14:33:15
TAG-FINISHED=20.04.2000, 14:34:26
REPORT-STARTED=20.04.2000, 14:34:27
REPORT-FINISHED=20.04.2000, 14:34:27
REASON=2
PROGRESS=8
STATUS=1
ERRORCODE=0
ERRORTXT=

```

The file mainly consists of data and time stamps that are self-explanatory. The possible codes for "Reason", "Progress" and "Status" are listed in the following tables.

Reason: The reason for the swapping; 5 states with the following meaning:

State	Reason
1	The drive fill level set for the fill level-controlled archiving has been exceeded.
2	The start time set for the time-controlled archiving has been reached.
3	A manual swapping was triggered.
4	New swapping attempt after an unsuccessful swapping.
5	Cancel job after multiple unsuccessful swapping attempts.

Progress: Progress display; 8 states with the following meaning:

State	Progress
1	Calculation of the space that is required on the data carrier.
2	Check of the data carrier size.
3	Generation of the swapping folder on the data carrier.
4	Swapping alarms.
5	Swapping measured values.
6	Swapping reports.
7	"Finished" message to the database.
8	Deletion of the import data, if available.

Status: State of the swapping; 3 states with the following meaning:

State	Status
1	Swapping has been completed, ready for the next swapping.
2	Swapping has been canceled.
3	Swapping has been started.

Note:

A swapping has only been performed completely and correctly if it shows Progress: 8 and Status: 1.

Errorcode: Indicates the error, 9 states with the following meanings:

State	Errorcode
0	No error.
6	Error while reading from the database or while writing to the database.
11	No data carrier present. Not enough space on the data carrier. Data carrier is locked. Incorrect data carrier.
16	Error while estimating the space on the data carrier in %.
17	Error while creating the folders on the data carrier.
18	Error while creating the "Archive.ini" file in the current swapping folder.
19	Error while swapping the alarms.
20	Error while swapping the measured values.
21	Error while swapping the reports.

9.9.2 Notes regarding the Storage Space Requirement on the Archive Drive

The storage space required on the archive drive cannot be calculated in advance. The storage space required depends on the amount of messages and on the data type and content of the tags.

Example:

In Tag Management, an internal tag of the floating-point number 32-Bit data type with a start value of 1 (not 1.0) is created. This tag is written by Tag Logging into a sequence archive every second. In the corresponding swap file (*.csv), this value will also be displayed only as 1. If the value of this tag is changed - for example via an I/O field - to 1.111111, it will - from this moment on - be maintained in the swap file as 1.11111104488372803. In the csv file, this will require an additional 18 ASCII characters for each entry, i.e. 3600*18 characters more per hour. If swapped out every hour, the csv file in the one case occupies approx. 134 KB and in the other approx. 621 KB. Due to the internal optimization of csv files, the special case may occur where a floating-point number only requires as much storage space as a binary tag.

For messages, the storage space required primarily depends on the amount of messages arising during the swap interval. In addition, comments (operating reports) and the dynamic parts of the message texts matter. Incrementing the internal message counter also causes the swap file to grow over time (although only very slightly).

For reports, the resulting file size depends primarily on the design of the reports.

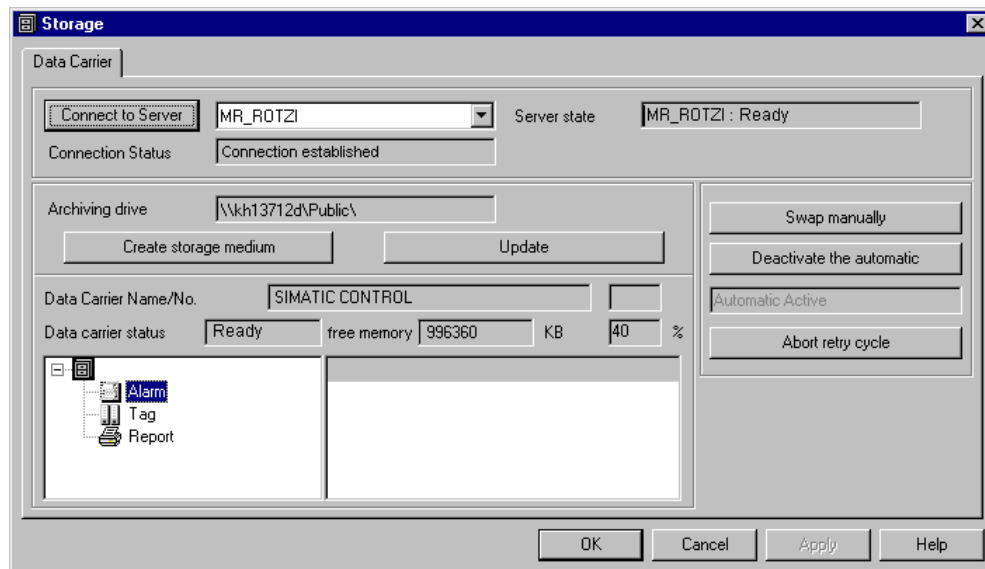
Example:

A simple report consists of a header, title, several measured values with descriptive texts and a footer. 10 measured values will result in a file size of approx. 50 KB, 20 measured values in a file size of approx. 70 KB and 30 measured values in a file size of approx. 90 KB.

9.10 Storage in a Multi-Client Project

On a multi-client, the operation of "Storage" is limited. Because of this, an operator station has to be set up on the server. Monitor, mouse and keyboard have to be connected permanently. For the server, the layout "SIMATIC_Server_1024x768" or "SIMATIC_Server_1280x1024" is recommended when configuring with the Split Screen Wizard.

A multi-client is not a configuration station, the configuration of "Storage" is only possible on a server or a client. Unlike the "Storage" dialog in a server project, the "Storage" dialog in a multi-client project only contains the "Data Carrier" tab. Via this dialog, you can control the archive server running on this server, provided the server's package has been loaded. If the "Storage" editor is opened in a multi-client project, the following dialog is displayed:



Data Transfer from the Storage Server to the Multi-Client

If the configuration of Storage - including the assignment of an individual data carrier label (e.g. "Boiler") - is concluded on a Storage server by clicking on the "OK" button before setting up the data carrier via the "Create Archive Data Carrier" function, the data carrier name and number in the opened Storage dialog on the Multi-Client will be represented by an empty string (default); i.e. the two display fields in the Storage dialog on the Multi-Client remain blank.

This empty string will also be transferred while the system is running, if -for example - the data carrier is changed but not yet set up on the server.

Updating the Data Fields in the Storage Dialog on the Multi-Client

In the opened Storage dialog on the multi-client, only the data fields "Connection Status", "Server Status" as well as data field and the button "Activate/Deactivate Automatic" will be updated automatically. All other information will only be displayed after hitting the "Update" button. The impression may arise that this information is also updated automatically. This will be the case, if the multi-client connection to the server is interrupted and then reestablished, which can occur automatically or by hitting the "Connect to Server" button. In such a case, all data for the Storage dialog on the multi-client will be determined new.

9.10.1 Permanent Operability and Storage

The Storage server (Archsrv.exe) runs on both WinCC servers - the master and its redundant partner server - while redundancy is active. From time to time, both WinCC servers may have different operating states or configurations (e.g. different data carriers).

Although the online redundancy synchronization provides the multi-client with feedback information about the status of the redundant partner server (in the form of process control messages such as "Not enough space available on the data carrier", "Data carrier not set up" or "Incorrect or full data carrier in the archive drive"), the information displayed in the multi-client's Storage dialog as well as the executable functions ("Create archive data carrier", "Deactivate automatic", etc.) refer only to the WinCC server currently connected to the multi-client.

The name of the currently connected WinCC Server and its server status are displayed in the "Server Status" field of the Storage dialog on the multi-client. The selection field "Connect to Server" only permits the selection of a server pair (symbolic computer name). To which WinCC Server the multi-client will connect in the end depends on the configuration:

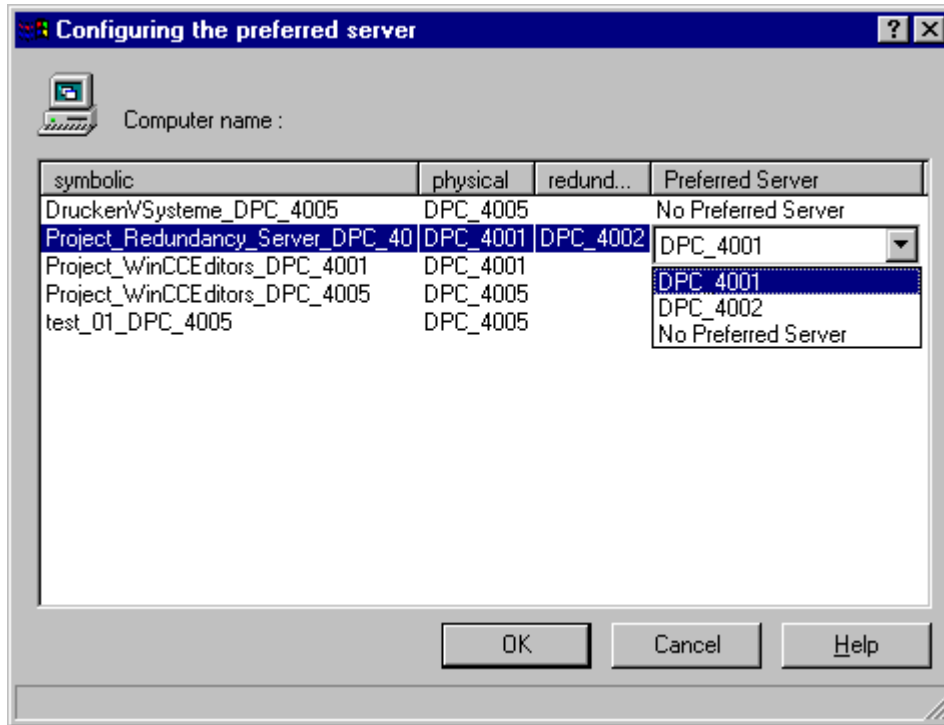
- If a preferred server was configured, then the multi-client will connect to it (assuming it has been activated properly).
- If no preferred server has been configured, the multi-client will connect to the WinCC Server that is currently the master.

If both WinCC servers of a redundant server pair are to be monitored, two multi-clients are required that each are configured with one WinCC server being their preferred server.

Preferred Server Configuration on the Multi-Clients

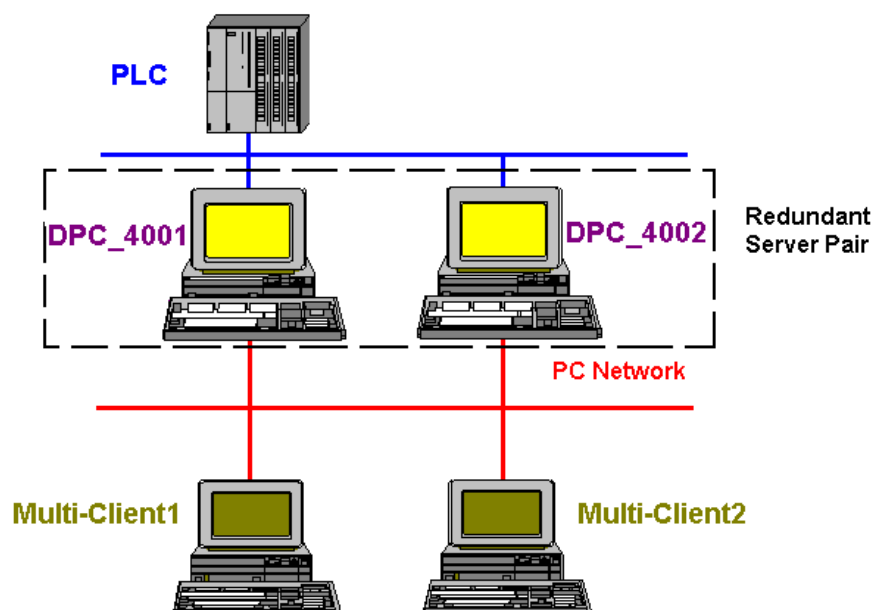
The preferred server for the respective multi-clients is configured in the WinCC Explorer by selecting the "Preferred Server" command from the pop-up menu of Server Data. The redundancy information - which server has configured which redundant partner server - is derived from the package loaded in the multi-client project.

The term "Preferred Server" applies to the server of a redundant server pair to which the multi-client connects first. The preferred server can be defined separately for each multi-client, allowing two multi-clients to be used to control and monitor both servers of the redundant server pair.



Example:

In the example shown below, "DPC_4001" is the master and "DPC_4002" its redundant partner server.



To monitor the master "DPC_4001" from the "Multi-Client1" and to operate the storage functions, "DPC_4001" is specified in the "Preferred Server" column of the "Configuring the Preferred Server" dialog.

Multi-Client1

Physical Computer Name	Redundant Computer Name	Preferred Server
DPC_4001	DPC_4002	DPC_4001

For the "Multi-Client2", "DPC_4002" is set under "Preferred Server".

Multi-Client2

Physical Computer Name	Redundant Computer Name	Preferred Server
DPC_4001	DPC_4002	DPC_4002

Storage and Redundancy Switch

A redundancy switch is performed in the case of a master failure and upon the return of the preferred server (after a failure). During a redundancy switch, data contained in the Storage dialog will be deleted, if the multi-client is connected to one of the two WinCC servers, to avoid inconsistencies. Afterwards, the multi-client has to reestablish the connection to the WinCC server.

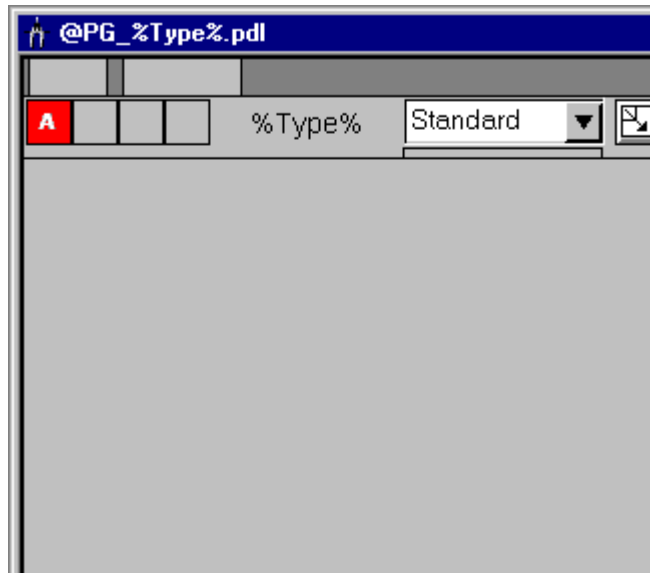
10 Faceplate Designer

10.1 Functionality of the Faceplate Designer

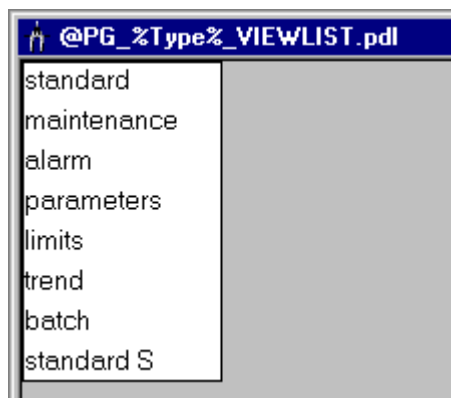
The Faceplate Designer is used to create complete picture blocks for controlling and monitoring measuring points or system sections such as motors, valves, sliders, measured values, etc.

A faceplate is created in four easy steps:

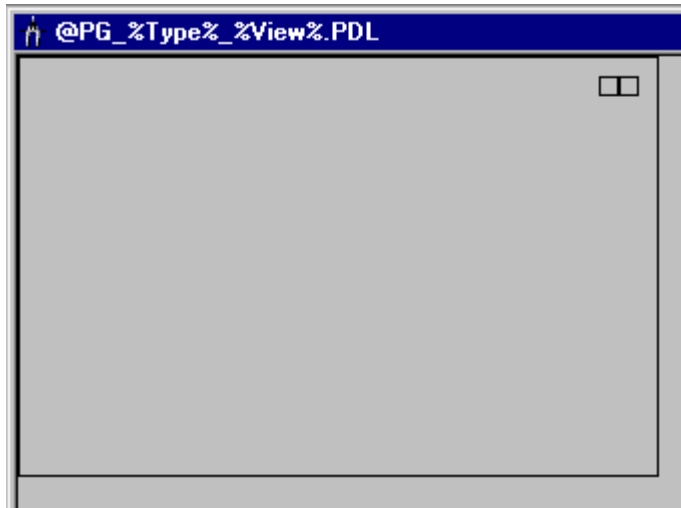
1. Adapt the group display frame to the block type.
For the configuration, the template "@PG_%Type%.PDL" is provided.



2. Adapt the view list to the block type.
For the configuration, the template "@PG_%Type%_VIEWLIST.PDL" is provided.



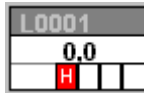
3. Edit the type- and view-specific pictures.
 For the configuration, the template "@PG_%Type%_%VIEW%.PDL" is provided.
 Ready-made block elements and customized objects are stored in the template pictures "@PCS7Elements.PDL".



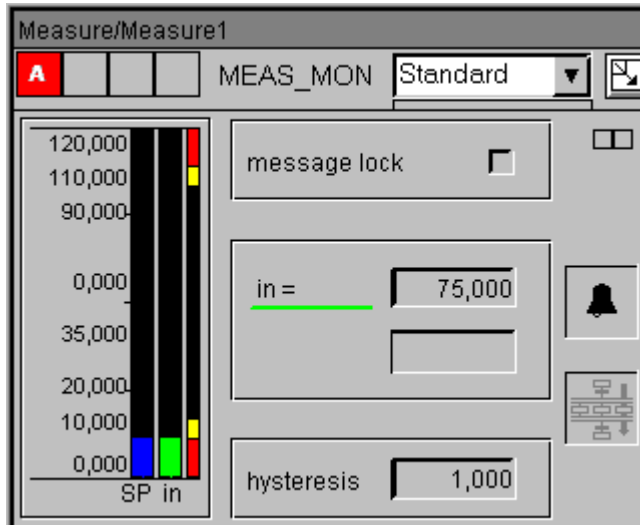
4. Adapt the object display frame to the block type.
 For the configuration, the template "@PL_%Type%.PDL" is provided.



The faceplate can be displayed in runtime by clicking on the corresponding symbol in the process picture. In runtime, the open picture functions "Picture via Measuring Point" and "Loop In Alarm" are provided as well. They require no additional configuration steps.



Example: Selection of a "MEAS_MON" faceplate by clicking on the MEAS_MON symbol.



The supplied block icons possess prepared call scripts for the respective faceplate types. These scripts do not have to be adapted instance-specifically. This means that the configuration of the block icons is done in a single step by connecting the prepared block icon to the AS block. A prerequisite for this is an AS block integrated via standard WinCC structure types.

10.2 Components of the Faceplate Designer

The Faceplate Designer provides you with the following components:

- Finished symbols for process pictures (block icons)
- Object construction set with objects for the faceplate creation
- Template pictures containing the individual faceplate components

The basic objects (buttons, status display, etc.) for the creation of faceplates are installed in the path "Siemens\WinCC\Options\PDL\FaceplateDesigner" during the installation of the Advanced Process Control option package.

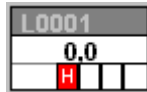
Finished example templates for block icons (valve, motor, slider, measured value) are installed in the path "Siemens\WinCC\Options\PDL\Base_Data_Pool".

The faceplate call scripts are installed in the path "Siemens\WinCC\Aplib\FaceplateDesigner".

Note:

In order to use the templates, the Split Screen Wizard must be started. The Split Screen Wizard copies the objects into the "GraCS" folder located in the project folder.

Finished Symbols for Process Pictures (Block icons)



The block icons are objects for the symbol view of the faceplates in process pictures. These objects are integrated into WinCC pictures and connected to an instance. In runtime, a mouse-click on the symbol opens the associated faceplate.

- Types: Valves, drives, measured values, sliders, etc. The available types are stored in the file "@Template.PDL" located in the path "Siemens\WinCC\Options\PDL\Base_Data_Pool".
When running the Split Screen Wizard, the file is copied to the "GraCS" folder located in the project folder.
- The example templates' shape, color scheme, design, etc. can be modified and quickly be adapted even to project-specifically created blocks.
- The finished call scripts for the faceplates are already included and do not have to be configured.
- The connection is configured quickly and easily with the Dynamic Wizard "Connect Picture Block to tag structure".

Note:

The symbols from the file "@@PCS7Typicals.PDL" are reserved for the deduction from the technological hierarchy and may not be inserted manually into other WinCC screens.

Object Construction Set

In general, all objects and customized objects contained in WinCC can be used for the faceplate creation, e.g. I/O fields, text fields, etc.

Via the installed Graphics Designer picture "@PCS7Elements.PDL", a number of finished objects (customized objects) are supplied. These ready-made objects facilitate the creation of your own faceplates. The picture is stored in the path "Siemens\WinCC\Options\PDL\FaceplateDesigner", when running the Split Screen Wizard, it is copied to the "GraCS" folder located in the project folder.

Note

A customized object is created by combining WinCC objects. In this case, a subset of the properties from all objects grouped can be selected and used for the connection.

Since WinCC objects as well as pre-configured customized objects contained in the template files can be used in the picture blocks, the remainder of the description will refer to both types as "Objects".

Overview:

Object	Properties
PCS7_Bar_Standard	Standard Bar Graph
PCS7_Bar_Limits	Limit Value Bar Graph
PCS7_MSG_LOCK	Status Display: Alarms suppressed / not suppressed / suppressed twice
PCS7_OCCUPIED	Status Display: occupied by Batch / not occupied by Batch
PCS7 AnalogValue	Operable Analog Value
PCS7 Negated Variable	Operable Binary Value

10.3 Configuration of Faceplates

For the configuration of faceplates, the required template pictures are stored in the path "Siemens/WinCC/options/pdl/FaceplateDesigner". Before the first application, the Split Screen Wizard should be started, which will copy the files to the "GraCS" folder located in the project folder.

The creation of a faceplate is carried out in four sequential steps.

1. Adapting the Group Display Frame to the Block Type

- Open the template "@PG_%Type%.PDL".
- Defining the block type:
Select the "Block Type" object (%Type%) and access its properties dialog. In the "Properties" tab, select the "I/O Field" entry and enter the desired block type in the "Object Name" attribute, e.g. MEAS_MON.
- Hiding the message status display, if it is not needed:
Select the "EventState" object and access its properties dialog. Via "Properties/Group Display/Miscellaneous", set the "Display" attribute to "No".
- Defining the standard view: Select the "@Faceplate" object and access its properties dialog. At "Properties/PCS 7 Tag Name/Texts", enter the desired standard view in the "First View" attribute, e.g. "@PG_MEAS_MON_STANDARD".
- Save the picture under the corresponding type name, e.g. "@PG_MEAS_MON.PDL".

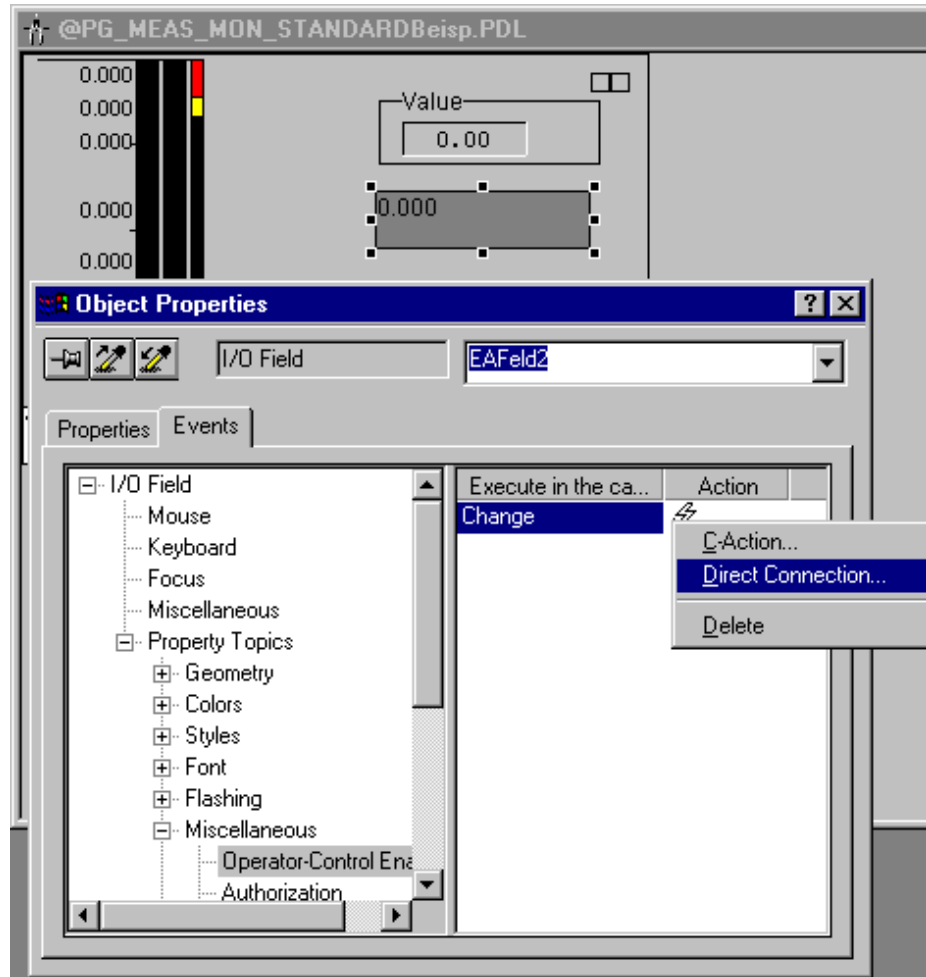
2. Adapting the View List to the Block Type

- Open the template "@PG_%Type%_VIEWLIST.PDL".
- A picture object containing the available views of the block type is displayed. Select the views not required and delete them from the list.
- Arranging the views in the desired order:
Select the individual entries in the list and move them with the arrow buttons.
- Adapting the frame and the picture size:
For the picture size, access the properties dialog of the picture object "@PG_%Type%_VIEWLIST". At "Properties/Picture Object/Geometry", the required changes can be made. Now access the properties dialog of the "Comboframe" object, at "Properties/Rectangle/Geometry", the frame can be adapted.
- Save the picture under the corresponding type name, e.g. "@PG_MEAS_MON_VIEWLIST.PDL".

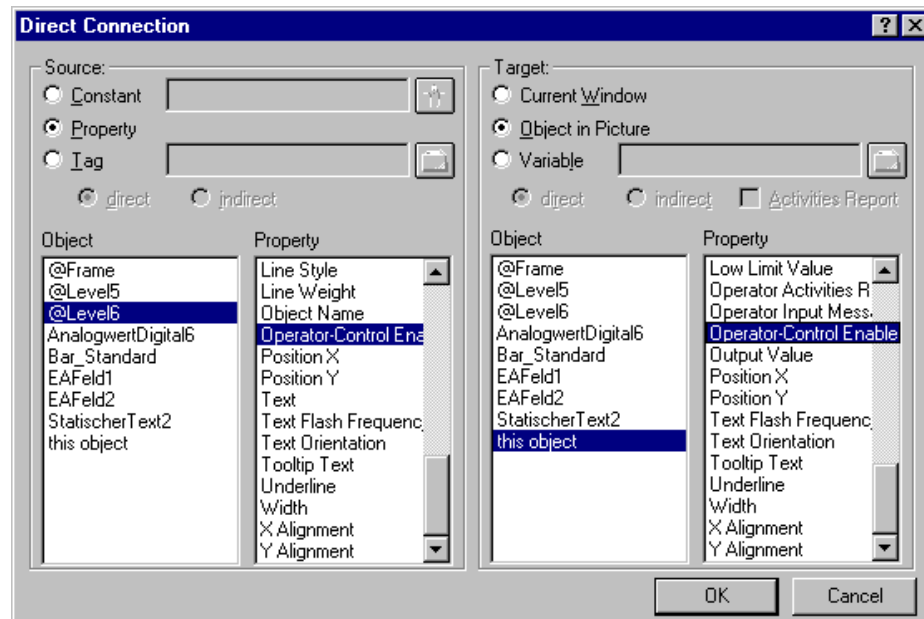
3. Editing Type- and View-specific Pictures

- Open the template "@PG_%Type%_&VIEW%.PDL".
- Incorporating and parameterizing block elements in the picture:
For the standard faceplates, the required block elements are already prepared and can be copied directly from the template files into the picture.
For example, copy the bar graph from the template picture "@PCS7Elements.pdl" and place it in the picture.
Following that, the properties of the block elements must be connected. If the target designations are known, they can be entered directly. Otherwise, the connection can be carried out via the Tag Browser. Note that the name of the AS instance may not be part of the tag name, e.g. in the tag name "System1_Motor2.U_AH", the instance name "System1_Motor2." must be deleted manually (incl. "."), the name is then "U_AH".
If possible, the update cycles should be identical for better performance (default = 2 sec.).
- Based on the objects "@Level5" and "@Level6", forming of a chain of direct connections for the individual authorization levels:

Example: If multiple I/O fields are to be protected with the authorization level 6, then the "Operator Control enable" property of the "@Level6" object must be direct-connected to the "Operator Control enable" property of the first I/O field.



Select the first I/O field and access its properties dialog. In the "Events" tab, the direct connection to the "@Level6" object can be configured.



The second I/O field must be direct-connected to the first and so on.

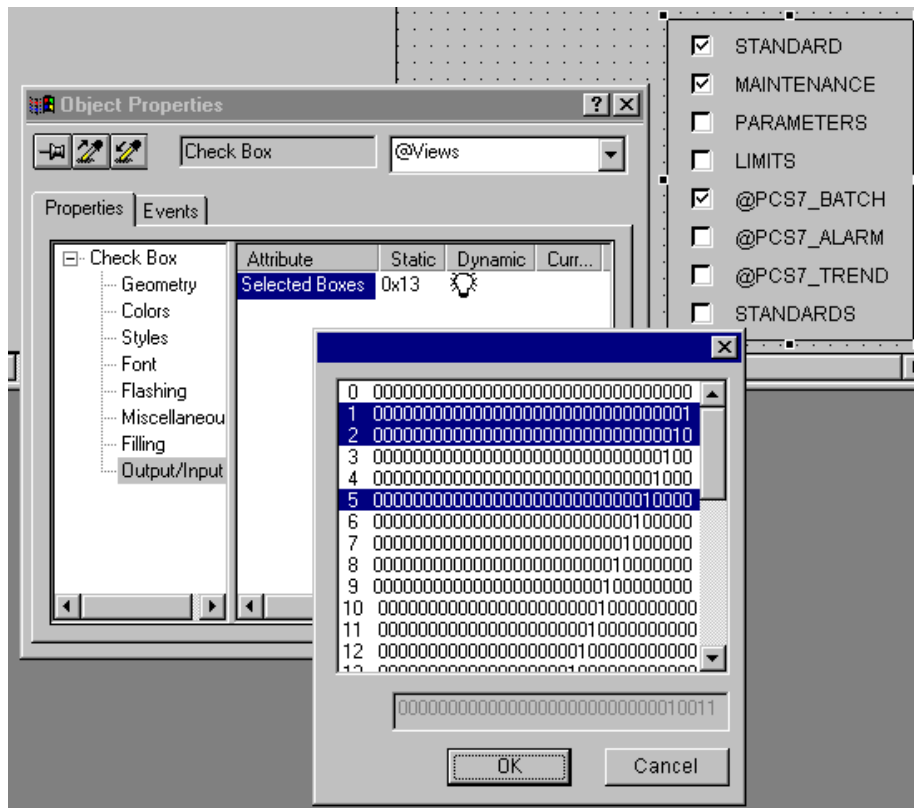
When configuring, note that newly added control elements are generally placed at the end of the authorization configuration chain. It is recommended to document the order of the authorization chain.

The background color change for the user authorization can be chained in the same manner.

- Save the picture under the corresponding type name, e.g. "@PG_MEAS_MON_VIEWLIST.PDL".

4. Adapting the Object Display Frame to the Block Type

- Open the template "@PL_%Type%.PDL".
- Select the "BlockType" object and enter the block type, e.g. @PG_MEAS_MON.
- Hiding the message status display, if it is not needed:
Select the "EventState" object and access its properties dialog. Via "Properties/Miscellaneous", set the "Display" attribute to "No".
- Entering the required views in the "@Views" object:
Access the object properties dialog and double-click on the "Selected Fields" attribute. In the dialog displayed, the desired fields can be selected. The first field possesses the running number 1. Confirm the selection by clicking on "OK".



- Removing the view elements not needed from the picture "@PL_%Type%.PDL":
Select the objects not required and delete them.
- Arranging the view elements in the desired order in the picture "@PL_%Type%.PDL":
Select the remaining objects sequentially and position them as desired.
- Adapting the picture size:
Access the properties dialog of the picture object "@PL_%Type%". At "Properties/Picture Object/Geometry", the required changes can be made.
- Save the picture under the corresponding type name, e.g. "@PL_MEAS_MON.PDL".

5. Testing the Picture Block

- In the WinCC Explorer, check the tag connections, direct connections and scripts via the picture's properties display. To do so, select the Graphics Designer editor in the navigation window of the WinCC Explorer; the data window will then list all available WinCC pictures of the "GraCS" folder. Select the edited picture and access its properties dialog. The "Dynamics" tab will list all available dynamics contained in the picture. By means of a double-click or via the "Type of Dynamics" list-box, details pertaining to the individual dynamics can be displayed.
- Runtime Test with AS Block
 - Open Picture, Group Display, Object Display, View Change
 - Display of tag name
 - Correct display of the tags

Additional Notes:

- If a template file (e.g. @PG_%Type%_%View%.PDL) is overwritten by accident, the original can be retrieved from the folder "Siemens\WinCC\Options\Pdl\FaceplateDesigner".
- It is recommended to initially store all user-created files for the faceplates in the "GraCS" folder of the current project. If the files are not to be overwritten by the originals the next time the Split Screen Wizard is run, they must be copied into the folder "Siemens\WinCC\Options\Pdl\FaceplateDesigner".
- If a project is to be used on another computer, a new folder named "FaceplateDesigner" can be created in the "ProjectFolder\GraCS". The faceplates stored in this folder will be copied into the "GraCS" folder of the project when running the Split Screen Wizard. Existing, identically named files will be overwritten.
- If required, the functions configured at user-defined faceplates can be protected against viewing and change in the Global Script editor. Additional information can be found in the Global Script editor documentation.

Application Guidelines

Compatibility to PCS 7 Faceplates

The faceplates supplied with PCS 7 (standard faceplates) can not be modified with the Faceplate Designer. You only have the option of creating new faceplates with the Faceplate Designer that are named identically to the standard faceplates (e.g. MOTOR, VALVE, MEAS_MON, ...). In this way, the standard faceplates will be overwritten. As a result, the newly created faceplates can be treated just like standard faceplates during the configuration and in runtime.

If standard faceplates were overwritten by accident, they can be copied back from the library into the project using the Split Screen Wizard.

Performance

The dynamics of the faceplates created with the Faceplate Designer can be completely controlled by the configuration. The performance of a faceplate is thus greatly influenced by the choice of dynamic configuration. In this context, it is especially important to maintain an optimal, streamlined interface between the AS and OS functions. This particularly applies to the block icons. Additional information can be found in the WinCC documentation under "Configuration Notes, Tips and Tricks".

Note:

In the dynamics of the faceplates, do not use C scripts with coded fixed instance names.

Do not mix different faceplate types in a picture that is used for the creation of a faceplate, i.e. a faceplate containing a valve control and a motor control is not permitted.

10.4 Filelist Faceplate Designer

List of files supplied for the Faceplate Designer:

File Name	Content
@PCS7Elements.PDL	Preconfigured Standard Objects
@Template.PDL	Block icons
@@PCS7Typicals.PDL	Block icons (Reserved for the deduction from the technological hierarchy.)
@PCS7_ALARM.PDL	Picture for displaying alarms in the faceplate
@PCS7_TREND.PDL	Picture for displaying trends in the faceplate
@PCS7_BATCH.PDL	Picture for displaying batch data in the faceplate
@PCS7_BinaryInput1of2.PDL	Field for entering Binary values
@PCS7_AnalogInputwithLimits.PDL	Field for entering analog values with limits
@PG_%Type%.pdl	Template picture for a group display faceplate
@PG_%Type%_%View%.PDL	Template picture for a view of a faceplate
@PG_%Type%_VIEWLIST.pdl	Template picture for a list-box of a view for the group display
@PL_%Type%.pdl	Template picture for an object display faceplate
@PCS7_AlarmCrossed.bmp	Status Display: Alarms suppressed doubly
@PCS7_AlarmDisabled.bmp	Status Display: Alarms suppressed
@PCS7_AlarmEnabled.bmp	Status Display: Alarms not suppressed
@PCS7_NotOccupied.bmp	Status Display: Not occupied by batch
@PCS7_Occupied.bmp	Status Display: Occupied by batch
@PCS7_OpenLoop.bmp	Picture for the button "opening object display from the group display"
PCS7_ChangeView.fct	Opens the view selected by the radio-button
PCS7_CheckPermission.fct	Determines whether the user is authorized for the specified level and tag
PCS7_OpenAnalogInput.Fct	Opens the field for controlling an analog value
PCS7_OpenBinaryInput.Fct	Opens the field for controlling a Binary value
PCS7_OpenGroupDisplay.Fct	Opens the group display from the process symbol
PCS7_OpenLoopDisplay.Fct	Opens the object display from the group display
PCS7_OperationLog.fct	Generates an operator message
PCS7_SetTagBit.fct	Sets the Bit tag and generates an operator message

File Name	Content
PCS7_UpdateBarDown.Fct	Changes a bar graph with top to bottom direction
PCS7_UpdateBarLimits.Fct	Changes all limit values of the bar graph display
PCS7_UpdateBarLimitsUp.Fct	Changes the alarm/warning low limit of the bar graph display
PCS7_UpdateBarSPLimits.fct	Changes the set-point values
PCS7_UpdateBarStandard.Fct	Changes all values of the bar graph display
PCS7_UpdateBarUp.Fct	Changes a bar graph with bottom to top direction
PCS7_UpdateGroupPermission.Fct	Sets user authorizations for the group display
PCS7_UpdateGroupTagname.Fct	Sets tag prefix, view, status display and comment for the group display
PCS7_UpdateLoopPermission.Fct	Sets user authorizations for the object display
PCS7_UpdateLoopTagname.Fct	Sets tag prefix, view, status display and comment for the object display
PCS7_UpdateTagname.fct	Sets tag prefix, view, status display and comment

11 Graphic Object Update Wizard

11.1 Functionality of the Graphic Object Update Wizard

The Graphic Object Update Wizard provides functions with which dynamic customized objects from WinCC pictures can be exported, imported or updated. In this case, information pertaining to dynamics, that is information about the connection to assigned tags, will be preserved. This makes it possible - based on a new template - to update existing objects in WinCC pictures. It is also possible to export information pertaining to dynamics into an Excel table, change it and then reimport it. This makes it very easy to copy dynamic WinCC pictures by changing the connection in the Excel table (e.g. to another system section) and then reimporting it.

The Graphic Object Update Wizard provides the following Dynamic Wizards for these functions:

Dynamic Wizard "Exporting Picture Objects"

This Wizard exports all customized objects with type identification contained in the current WinCC picture or project into an Excel table (.csv format). Among other things, the object type as well as the connection information are exported.

The Wizard recognizes the object type by means of the "Type" property of the customized object.

Dynamic Wizard "Importing Picture Objects"

This Wizard imports customized objects into WinCC pictures. The information required is generally taken from a file previously generated by the Dynamic Wizard "Exporting Picture Objects" (and possibly changed by the user). When importing, the customized objects specified in the file/Excel table will be recreated. For this purpose, template objects are accessed that have to be stored in a special template picture (@Template.pdl).

Dynamic Wizard "Updating Picture Objects"

This Wizard updates all customized objects with type identification contained in the current WinCC picture or project. The Wizard recognizes the object type by means of the "Type" property of the customized object. For this purpose, template objects are accessed that are stored in a special template picture (@Template.pdl).

Dynamic Wizard "Changing the Connection of the Customized Object"

This Wizard is used to for the later change of individual connections of customized objects in WinCC pictures (e.g. connection to another AS block instance).

Note:

When using the Import/Export Wizards, it is assumed that valves, motors, sliders, etc. in WinCC process pictures are displayed in the form of customized objects.

You still have a choice of faceplates for the process control: Either standard OCXs (e.g. Technological Library of PCS 7) or specific customized objects/WinCC control pictures can be used.

11.2 Configuration of the Graphic Object Update Wizard

11.2.1 Creation of Object Templates

For the central storage of customized objects, object templates are required in which the configured customized objects are saved.

Example: A common template exists for all valves in the flow pictures of a project, which can be changed centrally if required.

This object template is known as the "template picture". The name of the template picture has to start with the symbol "@". During the import process, the customized object templates are copied to the respective process pictures and provided with connection information. This assumes that the customized objects in the process picture - apart from the tag connection - do not have to be adapted instance-specifically, otherwise object information would be lost when importing. A script required for calling the faceplate, for example, has to be identical for all customized objects of one type. This can be achieved by having the script access the connection information (= AS block name) upon the mouse-click, which it uses to derive the name of the faceplate.

The customized objects have to meet the following conditions:

1. They must possess the "Type" property. In this property, the customized object type is entered, e.g. "VALVE".
2. The object name of the template object is identical to the object type, for the above example, this would be also "VALVE" (instead of "CustomizedObject7").

It makes sense to give the newly created object a unique identifier. For this purpose, the "Tag" (Identifier) property is provided. If this property is present, the current text contained in it will be exported into the "Tag" (Identifier) column of the Excel table. The entries can then be modified in Excel. During the import, these values will be entered into the "Tag" (Identifier) property of the respective customized object. Correspondingly, the optional "Trend" property is provided. This property is intended for trend group calls or other customized object-specific texts. The existing text is exported/imported into/from the "Trend" column of the export file.

11.2.2 Exporting Customized Object Templates

To export customized object templates from a WinCC picture into a csv file (ASCII file), open the corresponding WinCC picture with the Graphics Designer. In the Graphics Designer, select the Dynamic Wizard "Exporting Picture Objects" from the "Picture Functions" group. The Dynamic Wizard will generate the export file interactively. The following settings can be made:

Export from the currently open or all WinCC pictures:

You can select, whether the export file is to be generated only from the picture currently opened in the Graphics Designer or from all WinCC pictures of the project. Template pictures with customized object templates and PCS 7 system pictures are generally not exported. Files of this type can be identified by the prefix "@...".

Name of the export file:

In here, the name of the export file is specified. As the default name, "Export.csv" in the folder of the current project is suggested.

Separation of the tag name:

This option is especially meaningful for PCS 7 users who work with the technological hierarchy of the SIMATIC Manager. In this case, the tag name is separated by the separator "/" into up to 6 individual names, which provides more options to edit the export file.

If all or some of the customized objects of the opened WinCC picture do not possess the required object properties, a warning message will be displayed. The actions carried out for the export will be recorded in a log file. This log file is stored in the same folder as the export file (its name consists of the export file name plus the file extension .log).

11.2.3 Importing WinCC Pictures

To import a WinCC picture, open the WinCC picture in the Graphics Designer into which the picture stored in the Excel file is to be imported. It is recommended to make a backup copy of the pictures to be imported, since the process cannot be reversed.

Before the import, all objects with the "Type" property (column 1 of the Excel table) are deleted from the pictures to be imported. Therefore, the current version of a picture should be exported before starting the import.

The name of the template picture must begin with the symbol "@...".

With the Dynamic Wizard "Importing Picture Objects", the objects can be imported. The Wizard is accessed from the "Picture Functions" group.

The following settings can be made:

Name of the import file:

In here, the name of the import file is specified. As the default name, "Export.csv" in the folder of the current project is suggested.

Name of the template picture:

In here, the name of the template picture containing the template objects is specified. "@TEMPLATE.pdl" in the "GraCS" folder of the current project will be suggested.

If your import file contains objects that are not found in the template picture, a warning message will be displayed. These "unknown" objects will not be imported. If you added objects to the import file by copying existing lines, they will be regenerated.

The WinCC tag names of the import file will not be checked for their validity or presence in WinCC Tag Management.

11.2.4 Updating WinCC Pictures

If an export file is not needed for editing purposes, the Wizard "Updating Picture Objects" can be employed instead of exporting and then importing picture objects. For this, the concerned picture has to be opened in the Graphics Designer. It is recommended to make a backup copy of the pictures, since the process cannot be reversed.

With the Dynamic Wizard "Updating Picture Objects", the objects can be updated. The Wizard is accessed from the "Picture Functions" group.

The following settings can be made:

- Update the currently opened or all pictures: Here you can select, whether to update only the picture currently opened in the Graphics Designer or all pictures of the project. Template pictures with customized object templates and PCS 7 system pictures are generally not updated. Files of this type can be identified by the prefix "@...".
- Name of the template picture: In here, the name of the template picture containing the template objects is specified. "@TEMPLATE.pdl" in the "GraCS" folder of the current project will be suggested.

This Wizard replaces all picture objects possessing the "Type" property with those that are present in the template picture, without generating an export file. This makes sense, if an export file is not required for editing purposes. No log file will be created.

11.2.5 Changing the Connection of the Customized Object

With this Wizard, the dynamic connection to a customized object can be changed. In this case, the instance name (standing before the period of the tag) will be replaced. Dynamics with internal tags are not affected by this.

Open the picture in the Graphics Designer and select the customized object. With the Dynamic Wizard "Changing the Connection of the Customized Object" located in the "Picture Functions" group, the object can be changed.

The following settings can be made:

- Name of the structure instance name: In here, the new instance name is specified/selected. If no name is indicated, the instance name from the tag connection will be used.

11.2.6 File Format of the Export/Import File

Example of an Export/Import File

The Export Wizard generates a file in the .csv format as illustrated below. If required, the file can be modified or expanded. The Import Wizard regenerates objects (e.g. motors, valves) based on this file.

Picture Name	Object Type	Segment1	Segment2	Segment3	Segment4
MyPic.Pdl	MOTOR	-	-	MAIN	TYPICALS
MyPic.Pdl	MOTOR	-	-	MAIN	TYPICALS
MyPic.Pdl	VALVE	-	MAIN	BEF	DT1BA1
MyPic.Pdl	VALVE	-	MAIN	BEF	DT1BA1
MyPic.Pdl	VALVE	-	MAIN	BEF	DT1BA1
MyPic.Pdl	VALVE	-	MAIN	BEF	DT1BA1

Continuation of the Table

Segment5	Segment6	X-Pos	Y-Pos	Tag (Identifier)	Trend
SD0001	SDRIVE	200	120	SD0001	Trend_2
SD0003	SDRIVE	190	230	SD0003	Trend_3
Y71	SVALVE	20	20	Y71	Trend_6
Y78	SVALVE	20	70	Y78	Trend_xxx
Y78	SVALVE	710	90	Y78	Trend_test
Y79	SVALVE	20	20	Y79	Trend_test2

Comment: The name of a tag is formed by combining the columns "Segment1" to "Segment6",

for example: MAIN/TYPICALS/SD0001/SDRIVE for line 1

The names appearing in the table must not have blank spaces.

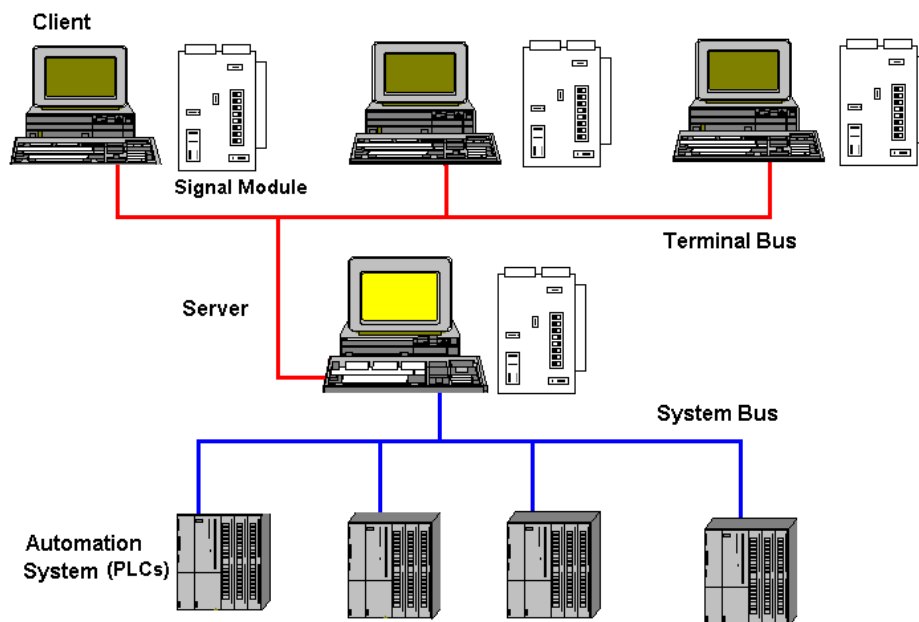
12 Hardware Options

12.1 Signal Module

12.1.1 General Information about the Signal Module

The signal module is used to control up to three different signaling devices (such as horns, buzzers, lights, etc.) and can be connected to a hardware acknowledgment button. It also includes a hardware timer (watchdog), which is retriggered cyclically by WinCC Runtime via a driver API call. An alarm will be initiated, if the triggering ceases due to an error (software protection, computer failure). The module also possesses 3 additional Binary inputs. The signal module is a PC module especially developed for the application in operator stations. It comes with an 8-Bit ISA bus interface (order number: 6DS 1916-8AA) or a 32-Bit PCI bus interface (order number: 6DS 1916-8RR).

The signal module is a hardware option to the WinCC system that is offered as an option package. The following figure shows the general structure of a system as well as the installation possibilities for the signal module within a system.



If the server operator station is to have multiple terminals (client operator stations), each terminal can be equipped with a signal module.

Installation in other PCs

According to our experiences, there are no limitations for the installation of the two cards.

Startup of the Signal Module

The signal module is started up in two steps:

- Installation of the signal module
- Testing of the signal module

12.1.2 Function Characteristics of the Signal Module

The signal module performs the following functions:

- Control of three acoustic or optical signaling devices
- Watchdog
- 3 Binary inputs
- Acknowledgment/resetting of the audible signals through software control or external wiring

A 25-pin and a 9-pin Sub-D-plug are located at the front of the module. The watchdog and signaling device functions are carried through the 25-pin Sub-D-plug. The 9-pin plug is not used.

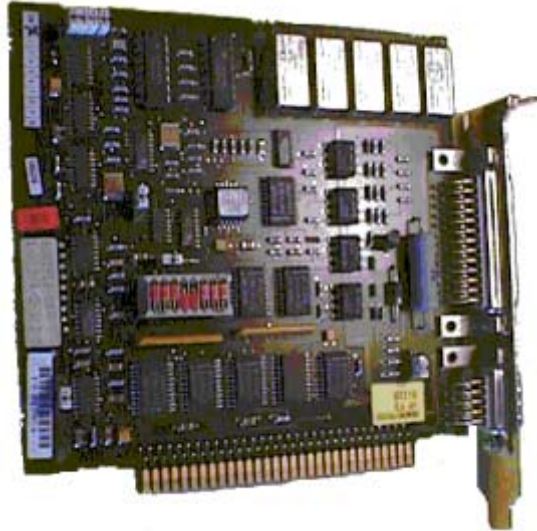
Via the Basic Process Control option package, the group signal or the group audible indicator is controlled by a logical OR.

When controlling through the software, the three signal outputs and the group alarm are reset. When acknowledging externally, e.g. via a button, only the group audible indicator is reset. The software forwards this state to all audible indicators - thus all audible signals will be reset as well when acknowledging externally.

All signals sent through the two plugs are isolated and implemented as relay contacts or optical couplers. The 24 V DC supply voltage, which is provided externally by the relay contacts or optical couplers of the signal module, must be 1 A protected by the customer.

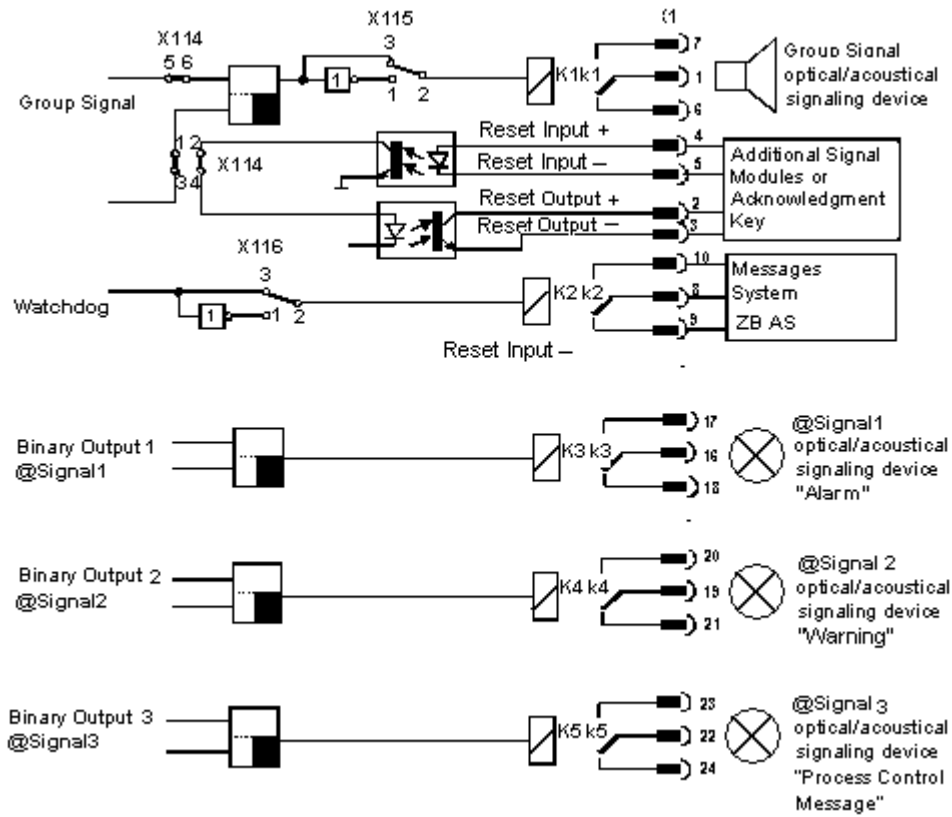
12.1.3 ISA Bus Signal Module

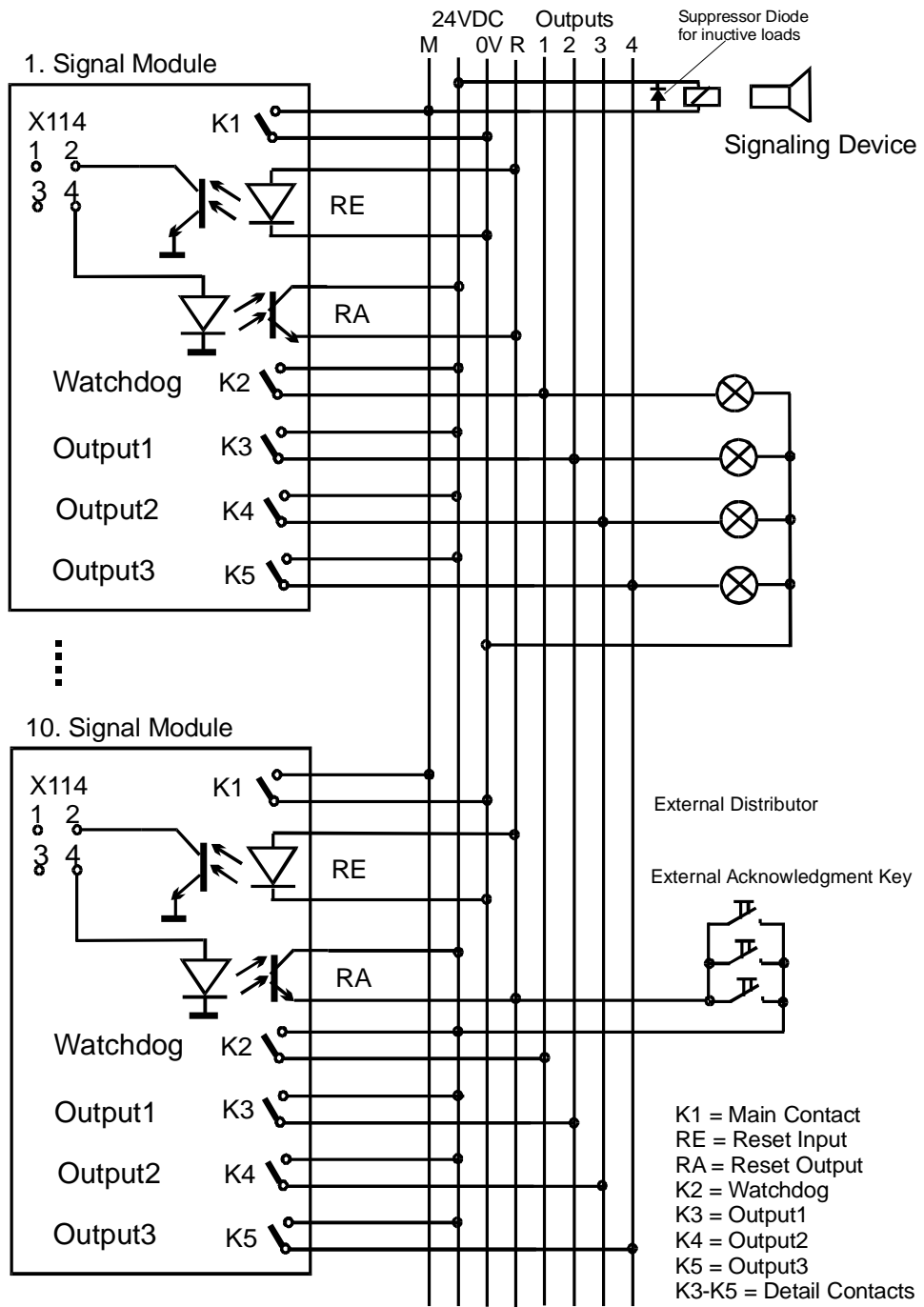
The signal module is an ISA bus card for PCs. It is used for controlling up to 3 external signaling devices and possesses 3 Binary inputs.



The signal module is plugged into the motherboard of the operator terminal PC. Check, whether an ISA slot is available. Note the addressing of the module to avoid address conflicts with other PC expansion cards. By default, the I/O address 180H is occupied by the signal module. For additional information, refer to the chapter "Addressing the ISA Bus Signal Module".

Example: 8-Bit ISA Bus Interface Circuit





Function Characteristics of the Signaling Device Output

The make contact of the signaling device output is open, if the operator terminal is turned off. The relay contact will remain open after the operator station is turned on. The contact will be closed, if a classified event occurs during the process run. Other events will only result in the closing of the signaling device output, if an acknowledgment was made prior. This acknowledgment can be performed either internally through WinCC or by means of an external acknowledgment button. It is possible to invert the function of the signaling device via the break contact.

Acknowledgment of the Signaling Device

The following acknowledgments are possible:

- With the mouse, when the signaling device is controlled only from one operator terminal:
Jumper X114: 1-3 and 2-4 closed (state on delivery).
- With the mouse or externally with the acknowledgment button when several operator terminals are connected, as shown in the figure above.
Jumper X114: 1-2 and 3-4 closed.
The acknowledgment signal is, in this case, looped through several signal modules.

The signaling device function can be switched off by removing jumper X114: 5-6 (see figure on previous page).

Watchdog

The watchdog function is used for monitoring the proper operating status of the OS (operator station).

After switching on the OS power supply, a monoflop is set cyclically on the signal module. This monoflop is retriggered just in time so as not to drop out.

If the process control of the operator terminal malfunctions, the monoflop on the signal module ceases 3.5 seconds after the last trigger impulse. Depending on how jumper X116 is set, the watchdog function can be inverted. When delivered, jumper X116: 2-3 is closed (Watchdog normal operation).

If an external signaling device (e.g. audible signal) is to be connected, a miniature contactor can be connected to the contact. This miniature contactor switches the signaling device. (Install an anti-surge diode for inductive loads!)

Binary Inputs

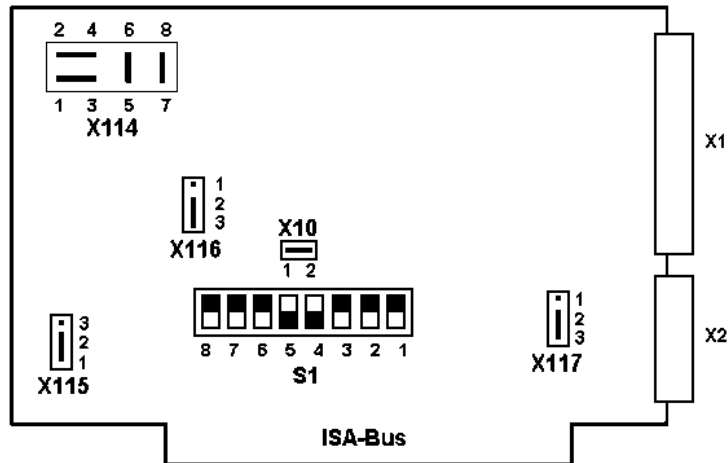
The signal module provides three binary inputs, isolated by optical couplers, for querying external binary signals.

They are intended for individual expansions and can be user-configured via the tags @SignalInput1... @SignalInput3.

12.1.3.1 Structure of the Switches and Jumpers with the ISA Bus

Overview

The following simplified representation of the signal module with 8-Bit ISA bus interface shows the physical arrangement and the pin numbering of the switches and jumpers (seen from the component side). Their use is explained below.



The factory settings of the jumpers and preset switch positions are shown in the figure. These default settings are indicated by "*" in the following table.

Structure/Description of the Jumpers/Switches/Interfaces

The desired functions of the signaling device, watchdog, plug control and addressing are set via plug-in jumpers.

Slot	Jumper	Description
X114	1-3*) 2-4*)	Acknowledge signaling device via bus interface
	1-2 3-4	Acknowledge signaling device via external signal
	5-6*)	Signaling device function on
	7-8*)	Watchdog function on
X115	1-2*)	Signaling device relay picks up on event
	2-3	Signaling device relay drops out on event
X116	2-3*)	Watchdog function normal
	1-2	Watchdog function inverted
X10	Closed*)	Addressing in the I/O area
	Open	Addressing in memory area
X1		25-Pin watchdog and signaling device interface
X2		9-Pin hardcopy interface
S1		DIP-switch for addressing the signal module in the I/O or memory area of the PC

The jumper settings marked with *) are the default settings. The plug connections X117 (1-2-3) are not used by WinCC.

12.1.3.2 Addressing the ISA Bus Signal Module

Overview

The signal module can be addressed in either the I/O area or the memory area of the PC. The base address for both addressing types is set using DIP-switch S1. It occupies 16 Bytes in the 0000H-03FFH I/O area and 1 KB in the C0000H-FFFFFFH area. The kernel driver uses the I/O addressing only.

Slot	Jumper	Description
X10	Closed	Addressing in the I/O area
	Open	Addressing in the memory area

Signal Module Address Lines

The signal module manages 12 address lines in the I/O addressing mode, of which the four lowest (A0 - A3) are used for switching the 16 required individual addresses. **These four address lines thus can not be set with DIP-switches.** This results in the following assignment of switch to address line (as described above in general form).

Possible Address Line Settings												
Switch	8	7	6	5	4	3	2	1				
Lines A	11	10	9	8	7	6	5	4	3	2	1	0

Setting the I/O Address

The I/O address can now to be set as follow using the available switches:

- Selection of the I/O address (e.g. 180h); the address must not be in use on the respective PC, otherwise an I/O address conflict will result.
- Conversion to Binary notation (0001 1000 0000); the conversion is simplified by considering each HEX digit as a 4-Bit block.
- Setting and deletion of the individual address Bits (**WARNING:** The 4 lowest-value Bits are not covered by the DIP-switches).

The given example (180h) thus has the following switch positions (**default setting**):

Default Settings (Address 180H)								
Switch Pin	8	7	6	5	4	3	2	1
Address Pin	11	10	9	8	7	6	5	4
Position	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF

Example for the Address 100H (0001 0000 0000)								
Switch Pin	8	7	6	5	4	3	2	1
Address Pin	11	10	9	8	7	6	5	4
Position	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF

12.1.4 PCI Bus Signal Module

The signal module is a PCI bus card for PCs. It is used for controlling up to 3 external signaling devices and possesses 3 Binary inputs.

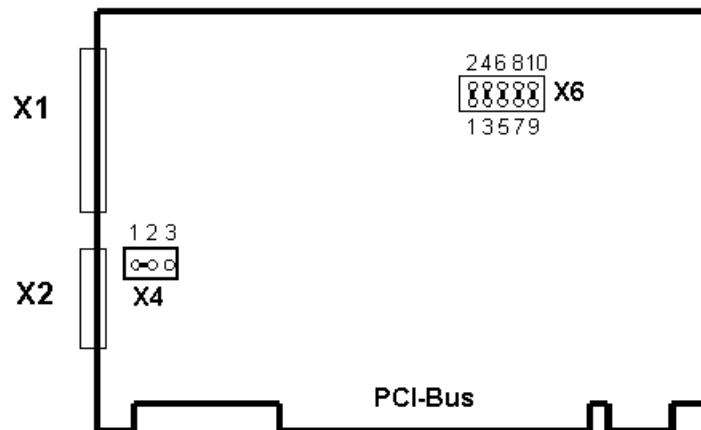


The signal module is plugged into the motherboard of the operator terminal PC. Check, whether a PCI slot is available.

12.1.4.1 Structure of the Switches and Jumpers with the PCI Bus

Overview

The following simplified representation of the signal module with 32-Bit PCI bus interface shows the physical arrangement and the pin numbering of the switches and jumpers. Their use is explained below.



The factory settings of the jumpers and preset switch positions are shown in the figure.

Structure/Description of the Jumpers/Switches/Interfaces

The desired functions of the signaling device, watchdog, plug control and addressing are set via plug-in jumpers.

Slot	Jumper	Description
X6	1-2 closed	Signaling device function on
	3-4 open 3-4 closed	Acknowledge signaling device via bus interface Acknowledge signaling device via external signal
	5-6 open 5-6 closed	Watchdog function normal Watchdog function inverted
	7-8 open 7-8 closed	Signaling device relay drops out on event Signaling device relay picks up on event
	9-10 open 9-10 closed	Watchdog function off Watchdog function on
	X4	1-2 closed 2-3 closed
X1		25-Pin watchdog and signaling device interface
X2		9-Pin hardcopy interface

The X6 jumpers are all closed upon delivery. The X4 jumper "1-2" is closed upon delivery.

12.1.5 Installation of the Signal Module

Procedure

The installation is broken down into multiple steps. Proceed as follows:

1. Hardware Installation:

The signal module hardware (plug-in card) is plugged into the base unit (motherboard) of the operator station. The card requires a free ISA or PCI slot in the OS. If the OS - as a server OS - possesses multiple terminals (client operator stations), each terminal may also be equipped with an additional signal module.

Before installing the ISA card, check whether the addresses used by the card (default settings) are still available on your PC. If the default settings are in use, the card must be reset via the DIP-switches. The preset address assignment of the signal module is 180H to 18FH in the I/O area. See the chapter "Addressing the ISA Bus Signal Module", if a different address area must be set in order to avoid address conflicts with other PC expansion cards.

It is not necessary to set the address for the PCI card.



2. Hardware Setup:

After installing the signal module plug-in card, the functionality of the card can be tested via the "Control Panel" of Windows NT. To do so, double-click on its icon in the "Control Panel" - this opens the "Signal Module Hardware Setup" dialog. The hardware setup of the signal module card can be performed this dialog.

3. Configuration via the "Alarm Logging Wizard":

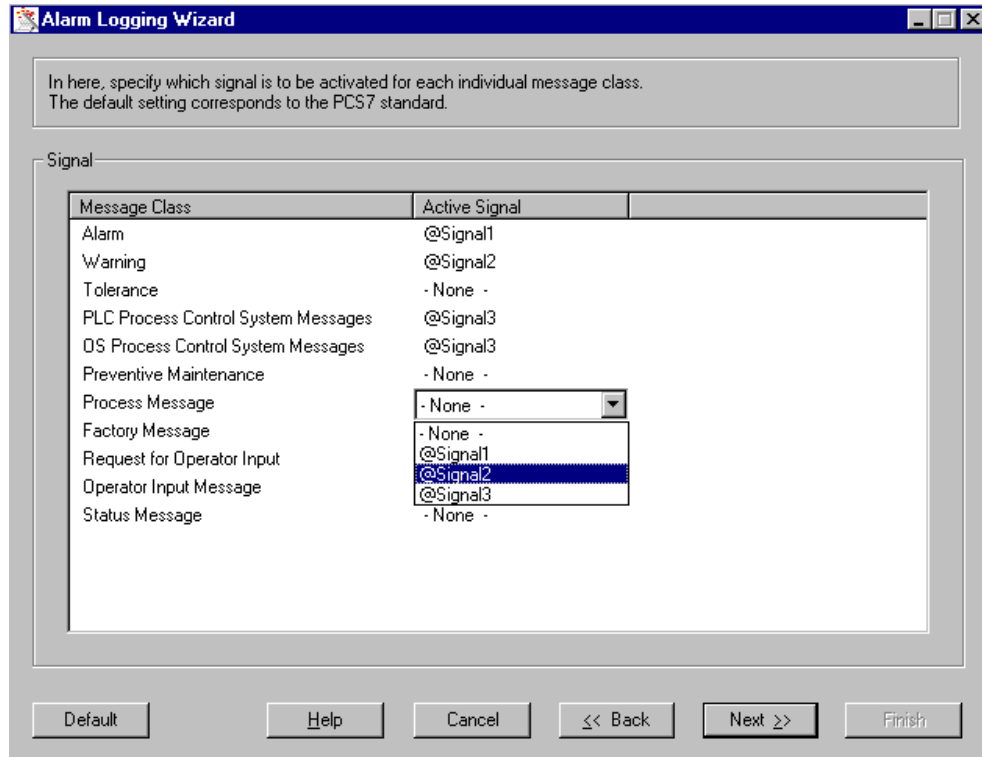
The "Alarm Logging Wizard" generates the internal tags "@Signal1"..."@Signal3" for controlling external signaling devices and "@SignalInput1"..."@SignalInput3" as images of the Binary inputs of the signal module. The Wizard adds the runtime module of the signal module (HMRT.EXE) to the startup list of the computer.

- In the project navigation window, double-click on the "Base Data" editor. This will list all installed components.
- Right-click on the "Alarm Logging Wizard" entry.

Select the "Open" command from the displayed pop-up menu.

On page 1, the "Signal Module Connection" check-box must be activated.

On page 3, the internal tags can be assigned to the message classes.



- Right-click on the appropriate message class in the "Active Signal" column. From list-box, select the desired tag.

12.1.6 Pin Assignment of the External Interface

Interface (X1) Pin Assignment

The external wiring of the signaling device output and the channel outputs is carried out directly, i.e. each contact controls a messaging device. In the event of an error message, the main contact and the assigned detail contact are set. An acknowledgment results in the control software resetting the main contact and all detail contacts. The acknowledgment may occur externally by means of an acknowledgment input or may be triggered by the software.

The following table shows the wiring of a 25-pin Sub-D plug, which is used for connecting external devices (lights, buzzers, bells, buttons, etc.).

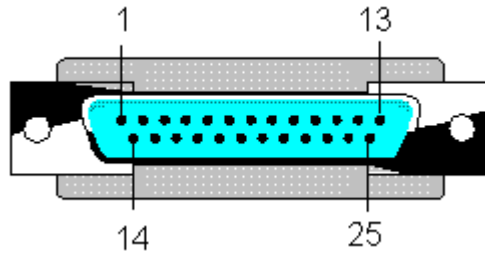
Pin	Signal	Description	Connection
*H	*S		
1	Signaling device M	Relay, center contact	
2	+	Reset output	Optical coupler
3	-	Reset output	Optical coupler
4	+	Reset input	Optical coupler
5	-	Reset input	Optical coupler
6	Signaling device R	Relay, break contact	
7	Signaling device A	Relay, make contact	
8	Watchdog M	Relay, center contact	
9	Watchdog R	Relay, break contact	
10	Watchdog A	Relay, make contact	
11	+	BI 1 *BI	
12	-	BI 1 *BI	
13	+	BI 2 *BI	Optical coupler
14	+	BI 3 *BI	
15	-	BI 3 *BI	
16	Output 1 M	Relay, center contact	
17	Output 1 A	Relay, make contact	
18	Output 1 R	Relay, break contact	
19	Output 2 M	Relay, center contact	
20	Output 2 A	Relay, make contact	
21	Output 2 R	Relay, break contact	
22	Output 3 M	Relay, center contact	
23	Output 3 A	Relay, make contact	
24	Output 3 R	Relay, break contact	
25	-	BI 2 *BI	

*H = Housing

*S = Shield

*BI = Binary Inputs

25-pin subminiature plug connector (pin connector with screw locking)



Comments

- The primary signaling device, i.e. the horn, signal lamp or similar, is to be connected to the main contact of the signal module. The primary signaling device responds every time a detail contact is set, i.e. each time an alarm reports via the signal module.
- The detail contacts can be connected to any messaging devices (lights, buzzers or similar).
- One device can be connected to the watchdog alarm output which responds when the respective signal module no longer triggers. This occurs when the respective operator station fails.
- By default, the signal module can only be reset by either the control software (driver) or an external acknowledgment button.

For both variants to be employed simultaneously, you must:

- close the jumper X114 pins 1-2 and 3-4 on the ISA card (refer to description "Structure of the Switches and Jumpers with the ISA Bus"), which enables the acknowledgment via an external button

or

- close the jumper X6 pins 3-4 on the PCI card (refer to description "Structure of the Switches and Jumpers with the PCI Bus"), which enables the acknowledgment via an external button

The external button is then to be connected to the reset input and, parallel to this button, the reset output switched through corresponding wiring.

12.1.7 Testing the Signal Module

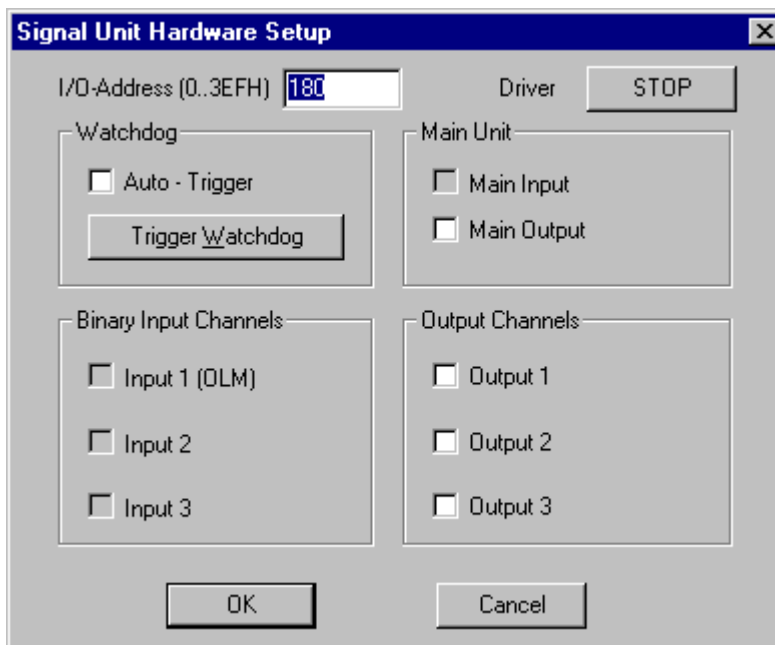
Procedure

In order to test the installed signal module plug-in card, proceed as follows:

- Access the Windows "Control Panel".
It can be accessed via the Windows "Start" menu, "Settings" and then "Control Panel".



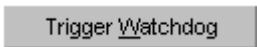
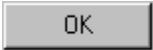
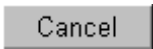
- Double-click on the icon to open the "Signal Module Hardware Setup" dialog.
- In the "Signal Module Hardware Setup" dialog, the signal module configuration can be tested.
- Structure of the "Signal Unit Hardware Setup" dialog for the ISA bus card.



- By activating the check-boxes "Output 1" to "Output 3" in the "Output Channels" field, the functions of the signal module and connected signaling devices can be tested immediately.

Dialog

The individual dialog fields are described in the following table.

Field	Description
I/O Address (=..3EFH)	For the ISA card, the I/O address must be specified (in the area from 0..3FFH). This address must correspond to the setting for S1 on the module. The signal module uses 16 successive I/O addresses beginning with the set base address. The address is always specified in the hexadecimal format. An address change will be entered in the registry after exiting the dialog via the "OK" button. The default address is 180 hexadecimal . For the PCI card, this setting is not required.
Driver	This button starts or stops the driver. Stop: The driver is already running and can be stopped by pressing the button. Start: The driver is stopped. If the button status remains unchanged after pressing the button, a hardware conflict may be present.
Watchdog Auto - Trigger	If this check box is activated, the driver will retrigger the watchdog every second until WinCC starts the signal module channel-DLL in runtime mode. When the channel-DLL is started, the automatic triggering function of the driver is deactivated and the channel-DLL takes over control of the watchdog triggering. When WinCC is ended, the watchdog is no longer triggered and the automatic triggering is reactivated.
	Press this button to trigger the watchdog once. (Test)
Main Unit	In the "Main Unit (Group Message)" field, only the "Main Output" check-box can be activated.
Main Output	When activating this check-box, the connected signaling device is activated at the output of the group signal.
Binary Input Channels	The status of the Binary inputs 1, 2 and 3 are shown here.
Output Channels	If an output is selected, the corresponding relay is controlled. While the system is running, the outputs are controlled by the permanently assigned tags.
	Use this button to exit the setup dialog. The I/O address and the automatic triggering settings will be entered in the registry.
	Use this button to exit the setup dialog. No changes will be made to the registry.

12.1.8 Important Settings within the WinCC System

In order to acoustically signal messages via the signal module in the WinCC system at specific operator terminals, the runtime module of the signal module (HMRT.EXE) must be added to the startup list of the client computers.

Note:

The runtime module of the signal module (HMRT.EXE) must not be added to the startup list of the server computer.

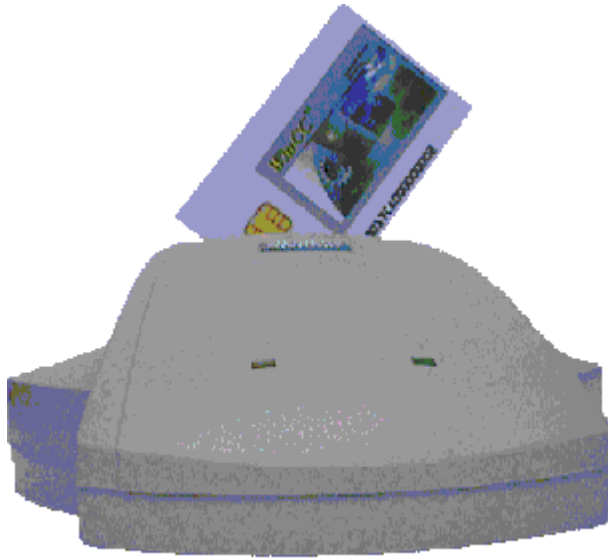
The runtime module of the signal module (HMRT.EXE) is added to the startup list of each computer by the "Alarm Logging Wizard" and should not be done manually. This Wizard is located in the WinCC Explorer at the "Base Data" editor. When running the Alarm Logging Wizard, the "Signal Module Connection" check-box (on the first Wizard page) must be activated to add the signaling device functionality.

12.2 Chipcard

12.2.1 Chipcard Reader

The chipcard reader is an external device for reading and writing to chipcards. To read or write to chipcards, you will need a hardware expansion that must be installed according to the manufacturer's specifications. The chipcard reader is connected to a serial interface. The following chipcard readers are supported:

- Siemens Nixdorf Chipcard Reader B1
- Siemens Nixdorf Chipcard Reader B1 Snuggle



Chipcard reader B1 with separate power supply



Chipcard reader B1 Snuggle is powered by the PS2 port

The PS2 connection is made between the computer and the keyboard/mouse.

Note

The hardware connections between the chipcard reader and the computer must be made before powering up the computer.

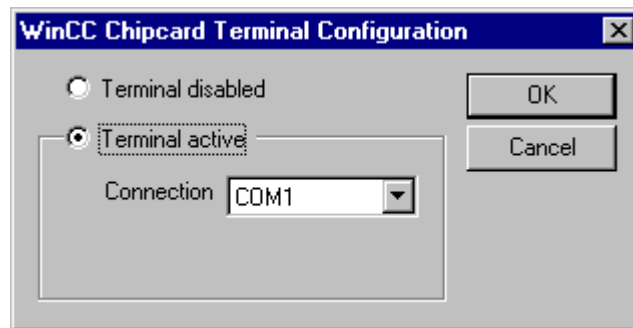
Setting the Interface

In order to use WinCC with the "Chipcard" option:

- the "Chipcard" option must be installed and
- the chipcard reader must be assigned an interface (e.g. COM1 or COM2).

To activate the menu in the User Administrator, install the WinCC "Chip Card" option and then carry out the following steps:

1. In the Windows NT Control Panel, click on the "WinCC Chipcard Terminal" icon. The "WinCC Chipcard Terminal Configuration" dialog requires the current user to have administrator rights.
2. In the "WinCC Chipcard Terminal Configuration" dialog that is opened, activate the option button "Terminal active".
3. Under "Connection", select the desired interface and close the dialog by clicking the "OK" button.



When you then open the User Administrator, the "Chipcard" option will be displayed in the menu bar.

If you activate the "Terminal disabled" option button in the "WinCC Chipcard Terminal Configuration" (Control Panel) dialog, the "Chipcard" option in the menu bar will be hidden again after you have restarted the User Administrator.

For the operation of WinCC, the writing of chipcards and the use of chipcards in runtime, administrator rights are not required.

Note

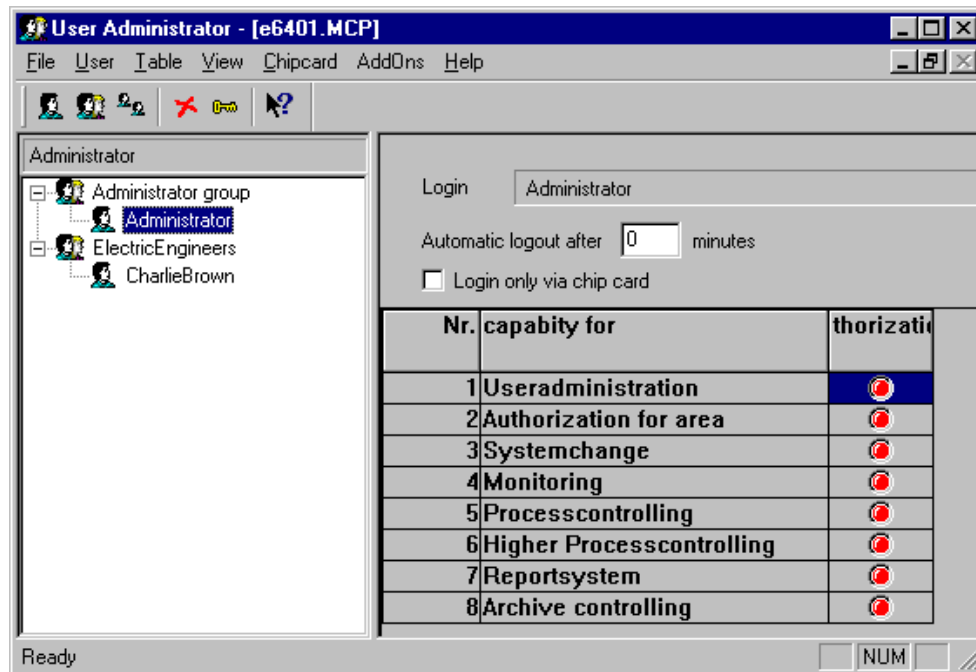
In runtime, the "Chipcard" menu is disabled, since its functions can only be applied in the configuration system.

12.2.2 "Chipcard" Option in User Administrator

If WinCC is installed with the options, the functionality of the User Administrator is expanded.

For example, the Split Screen Wizard ("Basic Process Control" option) changes the number of authorizations displayed in the table window.

The "chip card reader" option adds the menu "Chipcard" to the menu bar together with its associated functions and the "Login only via chip card" check box in the table window can also be activated.

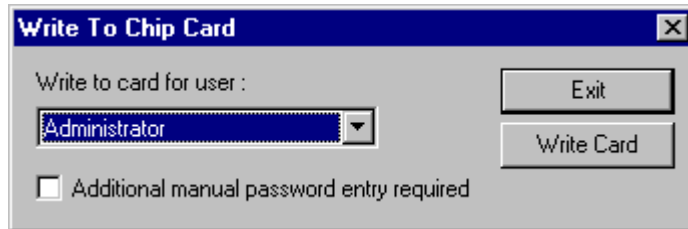


12.2.2.1 Menu Addition "Chip Card"

The User Administrator provides functions to control a chip card reader/writer. You can write and check chip cards in the configuration system. How to set the interface is described under Chipcard Reader.

Write To Chip Card

When you write to a chip card, all of the data on the card are deleted. The user (login name) and the password are stored on the chip card.



Note:

You can only activate this menu if WinCC has been installed with the "Chip Card" option.

Check Chip Card

To check whether the data was entered correctly, you can read from the chip card.



In the "User" field, the login name of the chipcard read is displayed. If the login name exists in the User Administrator, the text "Card is valid" will be displayed. If the name does not exist, the text "Card is invalid" will be displayed.

If there is an error when reading the chip card, it is noted in this dialog. No user name is provided.

Note:

You can only activate this menu if WinCC has been installed with the "Chip Card" option.

12.2.2.2 Chip Card Reader in Runtime

When you log on to Graphics Designer run time, insert your chip card in the reader and the necessary data are read. When the card is inserted, you cannot log on to the system manually. You remain logged on the system until you remove your card from the reader. The time switch does not log you out when you are working with a chip card.

Note:

To drive a chip card reader, WinCC must be installed with the "Chip Card" option. In runtime, the "Chipcard" menu is disabled, since its functions can only be applied in the configuration system.

12.3 Video

If you selected the option package "Video" during the user-defined installation of WinCC, an additional control object is available. The WinCC Win/TV Cinema Pro Control generates a window in which you can display a video that has been recorded with a video camera.

This option is described in the WinCC documentation.

13 Appendix

13.1 Functions of the Basic Packages

Function	SIMATIC Standard 1280*1024	SIMATIC Standard 1024*768	SIMATIC Standard 800*600
Overview Picture			
(Overall) Overview picture with up to 16 areas	●	●	●
Hardcopy key	●	●	●
Message line in the overview picture	●	●	●
Message acknowledgment	●	●	●
Display the current user	●	●	●
Group display for the areas	●	●	●
Picture selection via group display	●	●	●
Area marking	●	●	●
Analog clock	●	●	●
Digital clock with date display	●	●	●
Keysets			
Selection: Login dialog	●	●	●
Selection: Message display (new page)	●	●	●
Selection: Display of the print jobs	●	●	●
Selection: Configuring/Opening trends online	●	●	●
Selection: Picture selection via names	●	●	●
Selection: Picture selection via measurement points	●	●	●
Navigation keys for picture hierarchy	●	●	●
Selection: Previous picture	●	●	●
Memorize current picture	●	●	●
Selection: Select memorized picture	●	●	●
Memorize/call up/delete screen compositions	●	●	●
Selection: System configuration picture	●	●	●
Display picture information	●	●	●
Acknowledge the signal module	●	●	●
Acknowledge the group display	1) ●	●	●
Group acknowledgment in the message picture	●	●	●
Selection: Language-switch dialog	●	●	●
Selection: Online-Help	●	●	●
Selection: BATCH applications	2) ●	●	●

Function		SIMATIC Standard 1280*1024	SIMATIC Standard 1024*768	SIMATIC Standard 800*600
Selection: SFC visualization	2)	●	●	●
Selection: SAP connection	2)	●	●	●
Selection: Display camera pictures		●	●	●
Selection: Storage dialog		●	●	●
Selection: User Administrator		●	●	●
Selection: Dialog for deactivating runtime		●	●	●
Selection: Select the previously displayed graphic picture		●	●	●
Selection: New page		●	●	●
Selection: Old page		●	●	●
Selection: "Went out" list		●	●	●
Selection: Control system list		●	●	●
Selection: Operation list		●	●	●
Selection: Chronicle list		●	●	●
1) Effective only for event tags with S7PMC connection				
2) The mentioned packages must be installed				

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