SIEMENS

SIMATIC HMI

WinCC V7.0 SP1
MDM - WinCC: General information

System Manual

Print of the Online Help

11/2008

Legal information

Warning notice system

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

⚠ WARNING

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

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Disclaimer of Liability

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

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℗ 08/2009

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Service and Support

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1 Resources

1.1 Warnings

Safety notes

This manual contains information that must be observed to ensure your personal safety and to prevent property damage. Notices referring to your personal safety are highlighted in the manual by a safety alert symbol; notices referring to property damage only have no safety alert symbol. Depending on the hazard level, warnings are displayed in a descending order as follows:

⚠ DANGER

means that there can be severe physical injury or even death if the corresponding safety measures are not followed.

⚠ WARNING

means that there can be severe physical injury or even death if the corresponding safety measures are not followed.

⚠ CAUTION

means that there can be slight physical injury if the corresponding safety measures are not followed.

CAUTION

means that there can be damage to property if the corresponding safety measures are not followed.

NOTICE

means an undesirable result or state can occur if the corresponding instruction is not followed.

Note

is an important information about the product, the way to handle the product or the respective part of the documentation and we wish to especially bring this to your notice.

If multiple levels of hazards can occur, the warning is always displayed with the highest possible level. If a warning with a warning triangle is to be indicate physical injury, the same warning may also contain information about damage to property.

Qualified Personnel

The corresponding machine/ system may only be set up and operated with the help of this documentation. A device/system must only be commissioned and operated by qualified personnel. Qualified persons in the sense of safety instructions in this documentation stand for persons who are authorized to operate, earth and mark machines, system and electrical circuits according to safety standards.

Proper use

Please observe the following:

⚠ WARNING

The machine may only be used for the application instances that have been described in the technical description and only in combination with third-party devices and components recommended and/or approved by Siemens. Smooth and safe operations demand proper transport, proper storage, installation and assembling as well as careful operations and maintenance.

Brands

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Disclaimer of liability

We have checked the contents of the description to ensure that it matches with the hardware and the software it describes. Nevertheless, we cannot assume responsibility for any deviations that may arise. The details outlined in this description are checked regularly and the required corrections are done in the subsequent editions. Suggestions for improvement are welcomed.

The statements in the online documentation are more binding than the statements in the manuals and PDF files.

Please follow the Release Notes and Installation Notes. The information in these Release Notes and Installation Notes has priority over that in the manuals and online help with regard to legal validity.

Siemens AG

Automation and Drives

SIMATIC Human Machine Interfaces

P.O. Box 4848

D-90327 Nuremberg, Germany

1.2 Customer Support

Customer Support and Technical Support

Accessible from anywhere in the world - at any time! The languages used by the SIMATIC hotlines are German and English. Authorization hotline support is also available in French, Italian and Spanish.

Technical support

Nuremberg	(GMT +1:00)	
Service Hours	Monday - Friday, 7:00 to 17:00 (Local Time)	
Phone	+49 (180) 5050-222	(0.14 €/min from German landlines), cell phone prices vary.
Fax	+49 (180) 5050-223	
E-mail	http://www.siemens.com/automation/support-request (http://www.siemens.com/automation/support-request)	

SIMATIC Customer Support Online Services

SIMATIC Products

Go to the following URL for additional information about SIMATIC products:

- http://www.siemens.de/simatic (http://www.siemens.com/simatic)

Product Information and Downloads

You can get the latest product information and downloads useful for your application on the Internet at the following URL or on the Bulletin Board System:

- http://www.siemens.de/automation/service&support (http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo2&aktprim=99&lang=en)

Contact person database

To contact your local agent, search our contact database at the following URL:

- http://www.automation.siemens.com/partner/index.asp (http://www.automation.siemens.com/partner/index.asp?lang=en)

Technical documentation for SIMATIC products

You can find a guide to the technical documentation provided for individual SIMATIC products and systems at the following URL:

- http://www.siemens.de/simatic-tech-doku-portal (http://www.automation.siemens.com/simatic/portal/html_76/techdoku.htm)
- http://www.siemens.com/simatic-tech-doku-portal (http://www.siemens.com/simatic-tech-doku-portal) (in English)

Up-to-Date Information for WinCC

SIMATIC WinCC

Go to the following URL for additional information about WinCC products:

- http://www.siemens.de/wincc (http://www.automation.siemens.com/hmi/html_76/products/software/wincc/index.htm)
- http://www.siemens.com/wincc (http://www.siemens.com/wincc) (in English)

WinCC Online Support and FAQs

WinCC Online Support with information on FAQs (Frequently Asked Questions) and replacement parts as well as Tips & tricks may also be found in the Internet under :

- http://support.automation.siemens.com/WW/view/de/10805548/133000 (http://support.automation.siemens.com/WW/view/en/10805548/133000)
- http://www.siemens.com/automation/csi/faq (http://www.siemens.de/automation/csi/faq)

There, you find for example downloads of firmware updates, service packs and useful utilities.

See also

Technical Support: E-mail (http://www.siemens.com/automation/support-request)

Internet: SIMATIC Products (http://www.siemens.com/simatic)

Internet: Product Information and Downloads (http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo2&aktprim=99&lang=en)

Internet: Contact person database (http://www.automation.siemens.com/partner/index.asp?lang=en)

Internet: Technical documentation for SIMATIC products (http://www.automation.siemens.com/simatic/portal/html_76/techdoku.htm)

Internet: Information about WinCC (http://www.automation.siemens.com/hmi/html_76/products/software/wincc/index.htm)

Internet: WinCC Online Support (http://support.automation.siemens.com/WW/view/en/10805548/133000)

Internet: WinCC FAQs (http://www.siemens.de/automation/csi/faq)

Internet (English): Technical documentation for SIMATIC products (http://www.siemens.com/simatic-tech-doku-portal)

Internet (English): Information about WinCC (http://www.siemens.com/wincc)

1.3 Support Request

Dear customer

In order to provide you with fast and effective support, please complete the error report online on the Internet. Describe the problem in as much detail as possible. We would appreciate if you would provide us with all project data, so that we can reproduce the error situation or shorten the turn-around time.

Before filling out the error report, check whether your configured quantity structure is within the range of tested quantity structures (see topic "Performance Data").

Form for the error report

The error report form is available at URL:

- http://www.siemens.com/automation/support-request

When filling out the report, you will be guided through several steps, which will ask about all required information.

Procedure

1. Open the "Support Request" form using the link on the Internet. Step 1 "Select product" is displayed:
2. Enter the project name in the "Product/Order number" box. Upper/lower case is not relevant. Search for parts of the product name or enter the full product name in the correct order. You can e. g. search for the following terms:
   - "WinCC Runtime"
   - "WinCC DataMonitor"
   - "wincc webnavigator"
   - "Connectivity"

   The found products are offered in the "Product selection" field.
3. Select the desired product and click on "Next" to switch to step 2 "Select use case".
4. Select a use case or describe your specific use case in the "Other use case" field.
5. Press "Next" to switch to step 3 "Our solutions".
   Suggested solutions and FAQs for the selected key words are listed. The search terms in the "Your search term" field can be modified in any manner.
   Once you have found a suggested solution for your problem, you can close the form in the browser.
   If you did not find any applicable suggested solutions, press "Next" to switch to step 4 "Describe problem".
6. Describe your problem as exactly as possible in the "Details" field.
   Pay particular attention to the following questions and comments. Please also check the WinCC installation and configuration with regard to the following references.
   If you have any idea what has caused the error, please let us know. No detail should be omitted, even if you consider it unimportant.
   - Was the configuration data created with older WinCC versions?
   - How can the error be reproduced?
   - Are other programs running simultaneously with WinCC?
   - Have you deactivated the screen saver, virus checker and power management function?
   - Search the computer for log files (WinCC\Diagnose*.log, drwatson.log, drwtsn32.log).

   The log files are needed for error analysis. Thus, be sure to send the log files as well.
7. Use the "Search" button to upload your affected project and the log files (e. g. as a Zip file) to the error report.
   Press "Next" to switch to step 5 "Provide contact information".
8. Enter your contact information.
   Read the privacy notice and choose whether your personal data should be permanently saved.
   Press "Next" to switch to step 6 "Summary & Send".
9. Press the "Print" button if you would like to print the error report.
   Close the error report by clicking on the "Send" button.
   Your data will be transmitted to Customer Support and processed there.

Thank you for your cooperation. We hope that we can be of assistance in solving your problems.

Your WinCC Team

See also

Error report (http://www.siemens.com/automation/support-request)

1.4 Help on WinCC Documentation

1.4.1 WinCC Documentation

WinCC Online Information

WinCC assists you in your tasks by providing a wide range of comprehensive information and data.

Depending on the actual situation and needs, you can access background information, call up handling instructions, study examples or refer to summary instructions regarding a single operating element.

WinCC offers the following support for configuration tasks:

- Tooltips
- Notes in the status bar
- Direct Help
- WinCC Information System with detailed documentation
- PDF files

For Runtime operation, WinCC provides assistance in the form of "What's This?" help. Additional information can be accessed via a link from the "What's This?" help to the WinCC Information System.

Customized information for the user can be stored in the project. Users also have the option to configure additional help.

See also

Tooltips and Status Bar (Page 14)

Direct Help ("What's This?") in WinCC (Page 14)

WinCC Information System (Page 16)

Navigation in the WinCC Information System (Page 18)

Search in WinCC Information System (Page 21)

1.4.2 Tooltips and Status Bar

Information on Menu Commands and Buttons

After positioning the mouse pointer on a menu command or a button, a Tooltip on the corresponding element is displayed, providing a brief explanation of its features. Simultaneously, a brief description of the function appears in the status bar.

Information in the Status Bar

The status bar is the bar at the bottom of the WinCC window. It contains general and editor-specific information. General information relates, for example, to the keyboard settings and the current editing language. Editor-specific information includes information on the position and size of a selected object in the Layout Editor.

The status bar is also used to display information on menu commands and the buttons in the toolbars.

See also

WinCC Documentation (Page 13)

Direct Help ("What's This?") in WinCC (Page 14)

WinCC Information System (Page 16)

Navigation in the WinCC Information System (Page 18)

Search in WinCC Information System (Page 21)

1.4.3 Direct Help ("What's This?") in WinCC

Direct Help ("What's This?") in WinCC

The "What's This?" help contains information on the buttons, icons, fields, windows and dialogs in WinCC. After calling up the "What's This?" help, a help window is opened. The help window has options with which to request additional help from the WinCC Information System.

Call up Using F1

During configuration, you call up "What's This?" help by using the function key <F1>.

After selecting an element in a window or dialog, call up "What's This?" help on the element by pressing <F1>. The operable elements in a window can be selected by pressing key <F1>.

Call up Using a Button

Call up the "What's This?" help using one of the following buttons:

-  in the WinCC toolbar, in order to obtain help regarding buttons, icons and windows of WinCC
-  in the title bar of an open dialog, in order to obtain help regarding the dialog

The mouse pointer takes the form of a question mark. After clicking an element with the question mark, the "What's This?" help opens. The links provided in the "What's This?" help enable you to access the WinCC Information System. It contains further information, step-by-step instructions and examples.

When you right-click in the direct help, you can copy or print the direct help text.

Documentation outside the WinCC Information System

Help appears directly on the following topics:

- Cross Reference (working with cross reference lists)
- "PROFIBUS DP" Channel (communication)
- "SIMATIC 505 TCPIP" Channel (communication)

By clicking the "Search" and "Index" buttons, only the above individual documents are accessed. To search the entire WinCC Information System, click the "Global Search" button.

Accessing the WinCC Information System

If further help is requested from the "What's This?" help, a window opens containing the WinCC Information System. You are directed to the chapter containing information related to your "What's This" query. The title of the superordinated chapter appears in the window header. If another link to the WinCC Information System is selected from the "What's This?" help, a second window is opened.

Note

Close the windows that are not currently required. This helps limiting the number of open windows.

See also

Tooltips and Status Bar (Page 14)

WinCC Documentation (Page 13)

WinCC Information System (Page 16)

Navigation in the WinCC Information System (Page 18)

Search in WinCC Information System (Page 21)

1.4.4 WinCC Information System

Contents of the WinCC Information System

The WinCC Information System enables you to access the entire WinCC documentation at any time during configuration. It contains the following components:

- Complete documentation on WinCC
- Documentation on installed optional packs, add-ons and drivers
- Printable PDF version of the WinCC documentation
- Release notes with important up-to-date information on WinCC

Calling up the WinCC Information System

Menu command "?" > "Help Topics"

The "Contents" tab contains the graphic table of contents of the online documentation. It lists all available topics sorted by category.

Using the entry "Start Page", you can call up the WinCC Portal. It provides links to the most important topics in the WinCC Information System.

From "What's This?" help

A topic can be accessed directly from the related "What's This?" help.

From the Start Menu

The WinCC Information System can be called up using the Windows Start menu: "Start" > "Simatic" > "WinCC" > "WinCC Information System".

Structure of the WinCC Information System

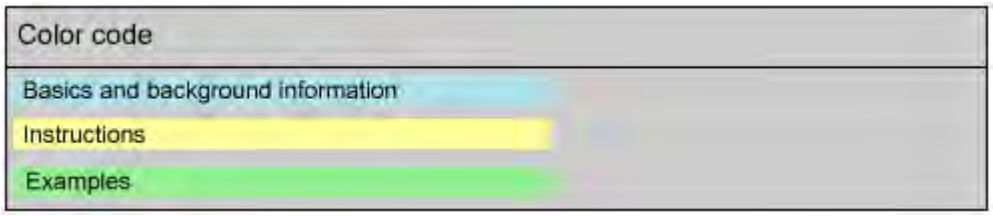
The WinCC Information System is divided into two panels: The navigation panel on the left features a number of tabs for different access and search options. The topic panel on the right displays the individual help topics.

Some help topics are not directly accessible in WinCC Information System. When you click a grey button on a page, a second window is opened with the respective contents. This window provides information on how to use the "Contents", "Index" and "Search" tabs. Use the ">>" and "<<" buttons to scroll to the next or previous page. Click the "Global Search" button to return to the WinCC Information System.

Color coding in the section headings in online help

section headings in online help are colored. The color code indicates the type of information provided in the related text. sections of the same information type have the same color.

The following table shows the different color codes used to identify the information types in online help.



Dropdown texts

Some pages of the online help features headings underlined in blue. Click these headings to call up drop-down texts.

The additional information consists of text, tables, etc. To hide the drop-down text, click it again.

The following notation is used in the online help:

Icon	Description
Expandable text	Heading with this form indicate expandable text in the online help.

Use menu commands "Tools" > "Open" and "Close" to open or close all drop-down texts of a page.

Print versions of the WinCC Information System

The help provided in the WinCC Information System can also be printed.

In the table of contents of WinCC Information System, double-click the entry for the section you wish to print. Open a page of the section by clicking the icon. A grey menu bar will appear on the upper edge of the displayed page. Open the printable version using the entry "Tools" > "Open PDF". To do this, you will need Adobe Acrobat Reader.

You can download the Adobe Acrobat Reader free of charge from the following URL:

- http://www.adobe.com/products/acrobat (http://www.adobe.com/products/acrobat)

The PDF files of the online help are also included on the WinCC product DVD in the "Documents" directory.

See also

Adobe Acrobat Reader (http://www.adobe.com/products/acrobat)

Tooltips and Status Bar (Page 14)

1.4.5 Navigation in the WinCC Information System

WinCC Portal

The start page contains the WinCC Portal links, providing an overview of the WinCC Information System.

Apart from the chapters of the WinCC Information System, you can also find links to Service and Support in the lower part of the page.

You can also easily enter the main chapter of WinCC Information by using the portal pages as the Homepage.

Navigation Area Tabs

The left panel of the Online Help contains the navigation section. The tabs allow you to search and access help in different ways:

Tab	Description
"Contents"	Contains a hierarchical overview of all help topics that can be accessed directly from here.
"Index"	The index terms can be used as a basis for searching for help topics.
"Find"	Enter a search term for full text search of the entire documentation.
"Favorites"	Use this function to store topics that you wish to refer to again. They can then be called up without having to search for them.

Navigation using Header Buttons

The buttons in the header provide the following access options:

Tab	Description
	Click this button to hide the navigation section with the "Contents", "Index" and "Search" tabs. The information system then requires less space on the screen.
	If the navigation panel is hidden, it can be unhidden again clicking this button. If the navigation panel is hidden, the table of contents displayed is not updated following a topic change.
	Click this button to return to the previous page.
	Click this button to go to the next page.

Navigation on the "Contents" Tab

The "Contents" tab contains the table of contents of the WinCC Information System:

Tab	Description
	Click this button to display the subordinate hierarchy levels of a book.
	Double click this button to simultaneously open a help topic and display the subordinate hierarchy levels. Click this button to open the help topic on its own, without displaying the subordinate hierarchy levels.
	Double click one of these buttons to open a help topic.
	Double click one of these buttons to open a an instruction for action.
	Double click one of these buttons to open an example.

Navigation on a Help Page

There is an additional menu bar above the title of a page. Move the mouse pointer over a menu item to call up the related list. Use the mouse to select the topic you wish to call up.

Tab	Description
In Section	Go to a specific topic within the page.
Instructions	Provides links to step-by-step instructions.
Examples	Provides links to application examples and sample cases.
Basics	Provides links to additional information, e.g. definitions or details.
Properties	Provides links to information on the properties of objects.
Methods	Provides links to information on methods that are applied to objects.
Events	Provides links to information on events that are applied to objects.
Objects	Provides links to information on related objects.

Tab	Description
Tools > Open PDF	Opens the printable PDF file of the help topic.
Tools > Open	Opens all closed dropdown texts and dropdown images.
Tools > Close	Closes all open dropdown texts and dropdown images.
Tools > Verlauf	Offers links to topics opened earlier. Maximum ten topics are saved in Verlauf.

Additional Links

For some topics, there are links provided directly on the help page. These links are indicated by a ▶ symbol or underlined in blue. Click the underlined text or the blue arrow to call up the additional information.

Navigation Using the Keyboard

The navigation options available for the mouse can also be operated using the keyboard.

Operation	Function
<ALT+RIGHT>	Go to next page.
<ALT+LEFT>	Go to previous page.
<LEFT>	Move the scroll bar in the active window to the left.
<RIGHT>	Move scroll bar in the active window to the right.
<UP>	Move scroll bar in the active window upwards.
<DOWN>	Move scroll bar in the active window downwards.
<CTRL+TAB>	Switch between the tabs ("Contents", "Index", "Search" and "Favorites"). Arrow Key Navigation in the Table of Contents
<ENTER>	Display a topic selected on a tab in the navigation panel. Trigger the function of the button previously selected.
<F6>	Toggle between navigation and topic panel.
<TAB>	Switch between the buttons in the topic area.

See also

WinCC Documentation (Page 13)
Tooltips and Status Bar (Page 14)
Direct Help ("What's This?") in WinCC (Page 14)
WinCC Information System (Page 16)
Search in WinCC Information System (Page 21)

1.4.6 Search in WinCC Information System

Full Text Search on the "Search" Tab

The "Search" tab enables you to search for a particular topic in a highly efficient manner.

Expanded Search

If the precise spelling of a term is not known or if you wish to search for all words containing the entered character string use the asterisk * as a wildcard. The asterisk stands thereby for any number of characters.

- Example: Using search term "*messages" the following words are found: "Messages", "System operator input messages", "Process controlling messages", "Process messages" etc.

Quotation Marks

Use quotation marks to search for phrases.

- Example: "Configuring graphics"

Boolean Operators

The arrow beside the input field can be used to logically link the search term with AND, OR, NEAR and NOT.

- Example: "Configuring" AND "graphics"

Match Similar Words

After clicking the "Match Similar Words" check box, a search is made for terms with a similar spelling. Special characters, such as umlauts, etc. are searched for as special characters in an ungrouped form.

Search Titles Only

After activating the "Search Titles Only" check box, a search is made only in the headings of the individual pages.

Search Previous Results

If the "Search Previous Results" check box is activated following a search, only pages found previously are searched for the new term. This of course limits the search and makes it more targeted.

Ensure that the check boxes are cleared prior to the next search where you wish to include all contents.

Sorting Search Results

To sort the search results alphabetically, click "Title" or "Location" button at the top of the list. In the "Location" column, you can see the help topic in which the respective page is included.

Storing Search Terms

The last search terms entered are stored in the list and can be called in again.

Displaying Search Results

After clicking on a topic in the navigation panel, the corresponding page is displayed. The search term is highlighted on the page.

If the search term is only part of a word, it is possible that the term is not marked. Use the key combination <CTRL+F> to activate the search within the page.

See also

WinCC Documentation (Page 13)

Tooltips and Status Bar (Page 14)

Direct Help ("What's This?") in WinCC (Page 14)

WinCC Information System (Page 16)

Navigation in the WinCC Information System (Page 18)

WinCC System Overview 2

2 Resources

2.1 System Overview

Content

This System Overview will help you to come to terms with SIMATIC WinCC and to gain an understanding of the basic system logic. The following questions will be answered in the System Overview:

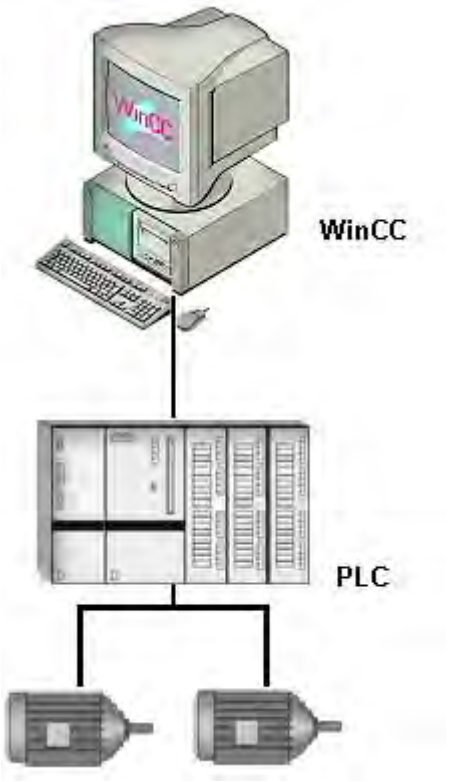
- How can SIMATIC WinCC be meaningfully integrated into your automation solutions? Which automation tasks can be executed using SIMATIC WinCC?
- Which components of SIMATIC WinCC handle which tasks? How do the individual components work together?
- Which Editors are used to carry out which configuration tasks?
- In which order should a configuration be executed?

2.2 SIMATIC WinCC

What is WinCC?

WinCC is a powerful HMI system for use under Microsoft Windows 2000 and Windows XP. HMI stands for "Human Machine Interface", i.e. the interface between the person (the operator) and the machine (the process). The automation process (AS) retains actual control over the

process. Communication is effected between the WinCC and the operator on the one hand and WinCC and the automation systems on the other.



WinCC is used to visualize the process and develop the graphic user interface for the operator.

- WinCC allows the operator to observe the process. The process is displayed graphically on the screen. The display is updated each time a status in the process changes.
- WinCC allows the operator to control the process. He can, for example, predefine a setpoint or open a valve from the graphic user interface.
- An alarm will automatically signal in the event of a critical process status. If, for example, a predefined limit value is exceeded, a message will appear on the screen.
- When working with WinCC, process values can either be printed or electronically archived. This facilitates the documentation of the process and allows subsequent access to past production data.

The Distinguishing Features of WinCC

WinCC can be optimally integrated into your automation and IT solutions:

- Being a part of the Siemens TIA concept (Totally Integrated Automation), WinCC works very efficiently with automation systems that belong to the SIMATIC product family. Automation systems from other producers are also supported.
- WinCC data can be exchanged with other IT solutions through standardized interfaces, such as with MES and ERP-level applications (a SAP system for example) or with programs such as Microsoft Excel.
- The open WinCC programming interfaces allow you to connect your own programs and you will therefore be able to control the process and process data.
- WinCC can be optimally customized to meet the requirements of your process. An extensive range of configuration possibilities is supported. from single-user systems and client-server systems right up to redundant, distributed systems with several servers.
- Your WinCC configuration can be modified at any time – even subsequently. This will not interfere with existing projects.
- WinCC is an Internet-compatible HMI system which facilitates the implementation of web-based client solutions as well as Thin-client solutions.

See also

Documenting Processes and Events (Page 89)

Creating and Archiving Messages (Page 86)

Archiving Process Values (Page 81)

Reacting on Input (Page 76)

Visualizing Processes (Page 73)

Openness (Page 34)

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Integration into the SIMATIC Environment (Page 30)

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Typical configurations (Page 38)

2.3 Application and configuration possibilities

2.3.1 Positioning in the HMI environment

Different Specifications

SIMATIC-HMI systems are visualization systems. The different products differ with respect to functionality, performance, hardware platform and openness.

Simple SIMATIC-HMI systems take the form of small key-operated or text-based panels. These are at the bottom end of the HMI product spectrum. SIMATIC WinCC, on the other hand, is a high-end visualization system.

See also

Integration into Corporate IT Solutions (Page 32)

Integration into the SIMATIC Environment (Page 30)

2.3.2 System Components

System Structure

WinCC has a modular construction. It consists of the basic WinCC system and can be supplemented with WinCC options and WinCC add-ons.

WinCC Basis System

The basic WinCC system consists of the following subsystems:

- Graphics System
- Alarm Logging
- Archiving System
- Report system
- Communication
- User Administration

The basic WinCC system consists of Configuration Software (CS) and Runtime Software (RT):

- You use the Configuration software to create your project.
- The Runtime software is used to execute the project while processing. The project is then "in runtime".

WinCC Options

WinCC options allow you to extend the functionality of the basic WinCC system. A special license is required for each option.

Options for scalable configurations

WinCC/Server

Allows a multi-user solution with up to 32 clients which receive data, messages, and pictures by means of TCP/IP directly from the server. In a distributed system, the application can be distributed from a functional viewpoint or according to system areas to up to twelve servers.

WinCC/WebNavigator

With the combination of Web Navigator server and client, you have the option, using the standard facilities of WinCC, of implementing a new type of distribution of operator and monitor functions for your programmable logic controller over the Internet or intranet.

Options for Increasing Availability

WinCC/Redundancy

WinCC Redundancy is used to configure a redundant system. The availability of WinCC and the system as a whole are enhanced by parallel operation of two interconnected servers and automatic switching of the servers in the event of a malfunction.

WinCC/ProAgent

The ProAgent option package lets you configure powerful process diagnostics. The process diagnostics helps you to detect and eliminate potential malfunctions in a short space of time. You thus increase the availability of your system, cut down times and lower costs.

Options for Process Instrumentation and Control System

WinCC/Basic Process Control

Contains WinCC basic data and extensions which make a WinCC station suitable for control engineering applications - and with a minimum of engineering effort at that. Picture Tree Manager, OS-Project Editor and Lifebeat Monitoring are just some of the functions included.

WinCC/Advanced User Administrator

Supports system-wide management of all users with numerous security mechanisms for the administrator and users. Time-stamped log flies support extensive evaluation of all actions - a prerequisite for satisfying FDA requirements

Options for Archiving, Data Evaluation and IT Integration

WinCC/DataMonitor WebEdition

WinCC/Data Monitor is used purely for displaying and evaluating current process statuses and historical data on Office PCs using standard tool such as Microsoft Internet Explorer or Microsoft Excel. Operating as a Web client, it is supplied with current and historical process data from a Web Navigator server.

WinCC/UserArchives

For storing freely structurable data records in the integrated WinCC database. The data records are displayed by means of a freely configurable ActiveX control as a form or table at runtime. Includes import/export functions for reading data in and out by means of external applications such as Excel.

WinCC Configuration Tools

WinCC/IndustrialX

For even simpler and more cost-effective configuration by standardizing the display objects for similar objects (motor, pump, valve, etc.). IndustrialX uses ActiveX technology for process visualization. Configuration assistants (wizards) help to keep the creation of standard displays simple.

WinCC/Open Development Kit

The Open Development Kit describes open-system programming ports, with which data and functions can be accessed by the configuration and Runtime systems.

WinCC Communication

WinCC/Communication Channels

All important communication channels for connecting to SIMATIC PLCs and inter-PLC channels (such as OPC) are supplied with WinCC. Furthermore, there are channels as an option for WinCC.

WinCC/Connectivity Pack

The WinCC/Connectivity Pack encompasses the OPC HDA and OPC A&E server for access to historical data of the WinCC archive system and for forwarding messages and acknowledging by means of superimposed control systems.

WinCC can be specifically extended by means of these open and standardized interfaces.

WinCC Add-ons

WinCC Add-ons are developed and marketed by other Siemens departments (such as the WinCC Competence Center) and external suppliers (such as WinCC Professionals, and system companies). Support for the WinCC add-ons is provided by the product suppliers concerned.

WinCC add-ons can solve versatile tasks such as maintenance management (MES software), energy management, import filters, industrial solution for water management, communication with PLCs from other manufacturers or the automatic transmission of radio calls when certain alarms occur in production departments.

Further information about the add-ons and the contact addresses of the manufacturers concerned will be found in the Add-on Directory on the Internet.

See also

Licensing (Page 36)

How WinCC Works (Page 50)

Openness (Page 34)

SIMATIC WinCC (Page 23)

2.3.3 Integration into the SIMATIC Environment

Totally Integrated Automation (TIA)

In addition to a HMI system like WinCC, a complete automation solution also requires further components, e.g. an automation system, a process bus and peripheral equipment.

Particularly wide-ranging integration is featured in WinCC with components in the SIMATIC product family. This integration facilitates:

- global configuration and programming
- global data maintenance
- global communication

The Direct Utilization of STEP 7 Symbols in WinCC

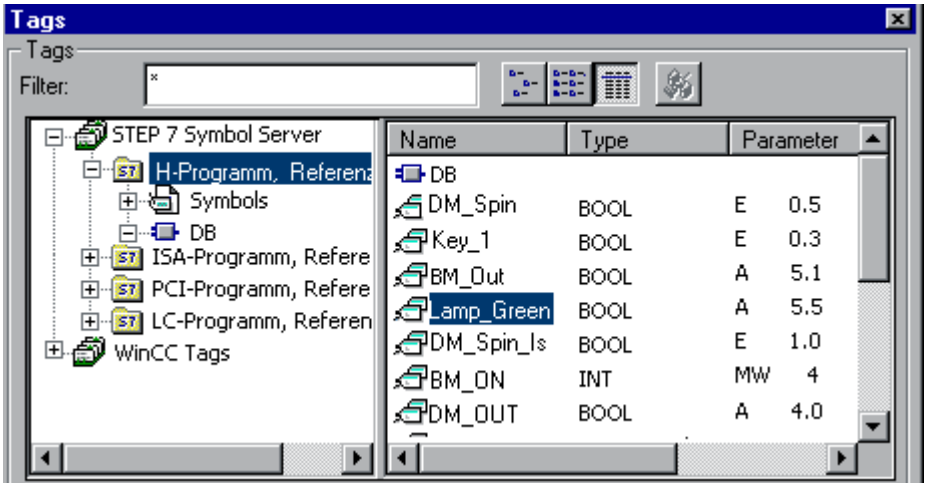
Global configuration and programming facilitates the direct utilization of STEP 7 symbols in WinCC.

Process tags form a link for communication between the automation system and the HMI system. Were it not for Totally Integrated Automation, each tag would have to be defined twice: once for the automation system and once for the HMI system. This would double the workload and greatly increase the risk of errors.

When working with WinCC, you can gain direct access to the symbol table that is defined in STEP7. You can access STEP 7 symbols directly by means of:

- the tag selection dialog
- the tag bar in Graphic Designer

If you select the STEP 7 Symbols check box in the Tag Selection dialog box, a list of all the downloadable STEP 7 symbols is displayed in the data window. These symbols are all inputs, outputs, and bit memories from the STEP 7 symbol list as well as the global data blocks.



Simplified Diagnostics

Diagnosis is greatly simplified by global data maintenance and global communication.

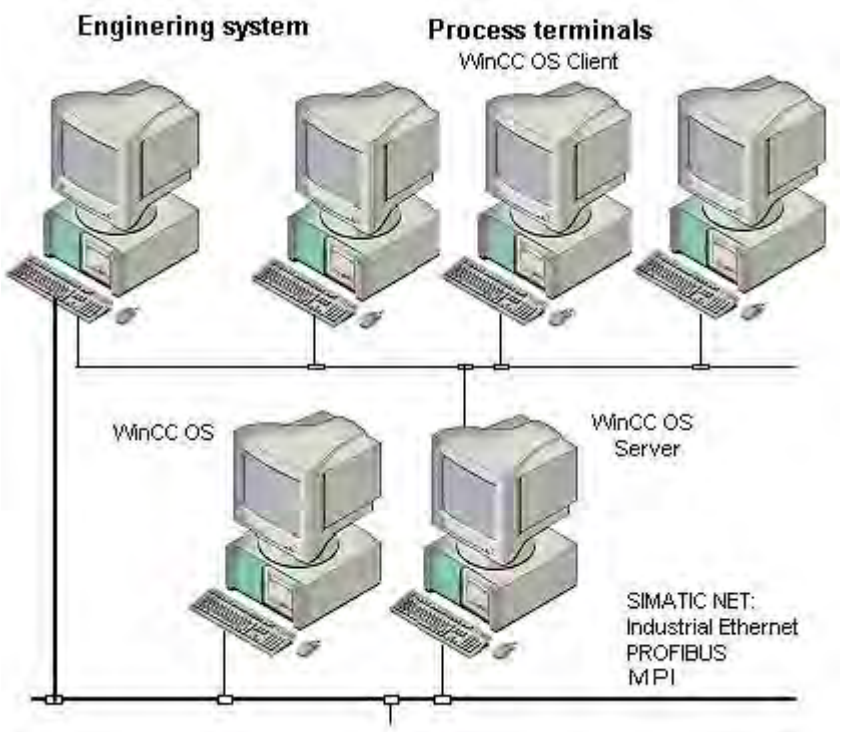
- In runtime, you can jump directly from WinCC to the corresponding program editor in STEP 7 (KOP/FUP/AWL). The focus will automatically lie on the STEP 7 symbol which belongs to the process tag. This function provides valuable support in the area of fault diagnosis.
- The WinCC function Hardware Diagnosis can be used to start the STEP 7 function Diagnose hardware in an S7 automation system directly from a WinCC picture.
- Channel Diagnosis offers diagnostic possibilities for communication between WinCC and S7 automation systems.
- In WinCC, automatically issued S7 system diagnostic messages from the programmable logic controller are displayed as multi-line message text by means of tooltips. These tooltips help to reduce system down times.
- Extensive diagnostic support is provided through the WinCC/ProAgent option. This option provides extensive process diagnosis for S7 automation systems and does not necessitate additional configuration.

Integration into SIMATIC PCS7

Global data maintenance and global communication also facilitate integration into SIMATIC PCS7.

SIMATIC PCS7 is the process control system from Siemens The Engineering Stations (ES) for configuration and the Operator Stations (OS) for operating and monitoring the process in runtime are central elements of PCS7.

WinCC is an important constituent of PCS7 and is employed in the Engineering and Operator stations.



See also

Openness (Page 34)

Integration into Corporate IT Solutions (Page 32)

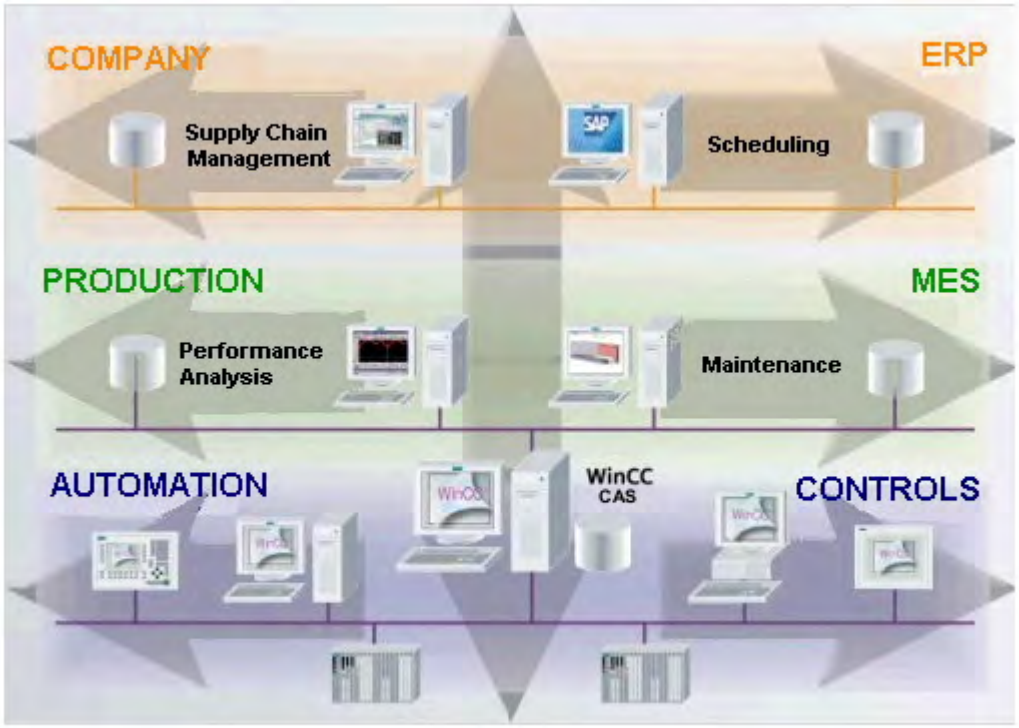
Positioning in the HMI environment (Page 26)

2.3.4 Integration into Corporate IT Solutions

Mode of Operation

Within many companies, individual solutions have lead to the development of a heterogeneous information topology. Individual groups of information-based sectors have had to be dissolved and the information made available at all times for every application, for every user at any location.

The flow of information here must not be purely horizontal, available at individual levels, but also vertically through the various levels: from the automation level (Controls) through the production level (MES: Manufacturing Execution Systems) and on to the company management level (ERP: Enterprise Resource Planning).



A decisive influential factor concerning the simplicity and speed with which a consistent IT integration can be implemented within a company is the development of an application which enables this through uniform data archiving, integrated standard interfaces and consistent handling methods for all data.

Based on the functional range specified below, version V7.0 of WinCC provides an ideal platform for IT integration.

- Consistent scalability, from the smallest single user station solution to client/server solution.
- Central enterprise-wide archive server (WinCC/Central Archive Server) on the basis of Microsoft SQL Server 2005 with data compression and integrated long-term archiving.
- Integration in corporate-wide applications by means of open interfaces
  - Database interfaces: OLE DB, SQL, ADO
  - Programming interfaces: VBS and ANSCI-C with access to API functions
  - OPC: OPC DataAccess (DA), OPC Alarms&Events (A&E) and OPC Historical Data Access (HDA)
- Evaluation options using special tools provided by the WinCC options or WinCC Add-ons.

See also

Openness (Page 34)

Integration into the SIMATIC Environment (Page 30)

Positioning in the HMI environment (Page 26)

2.3.5 Openness

Introduction

The open and standardized interfaces of WinCC make specific extensions simple.

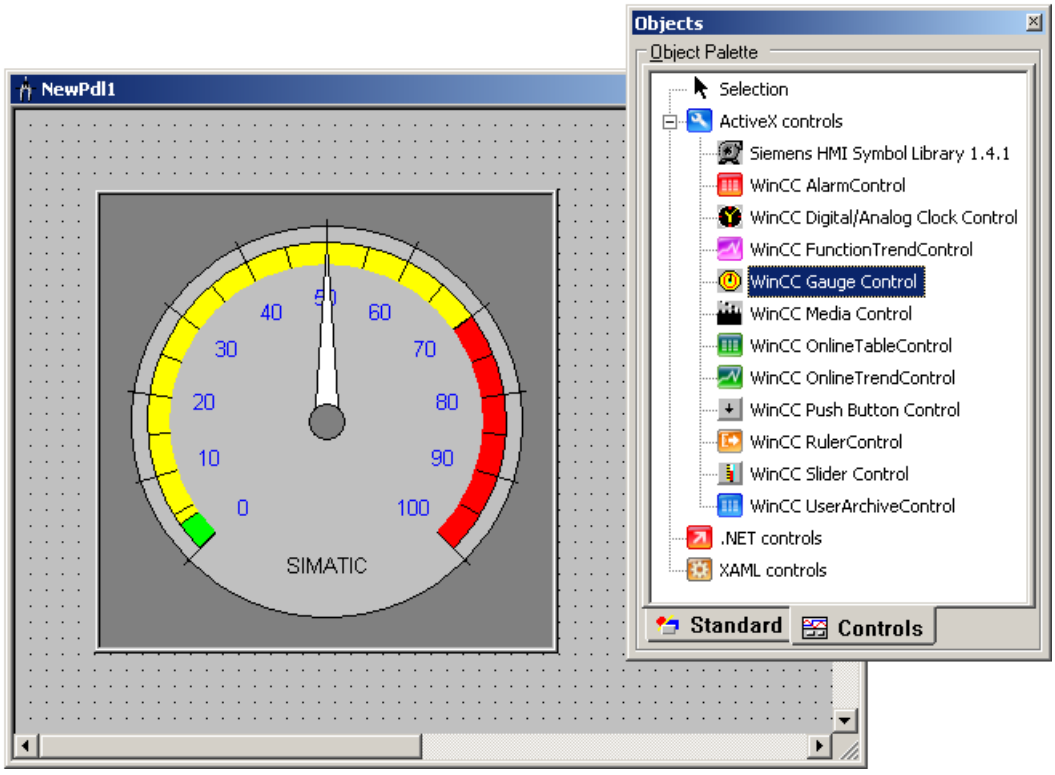
ActiveX Controls

ActiveX is a Windows standard for program modules that have their own user interface. These program modules are known as ActiveX Controls. An ActiveX control can contain a specific button, for example, or a graphic display element.

A large number of ActiveX Controls are provided with WinCC.

Additional ActiveX Controls can be acquired from other suppliers or can be individually programmed. The IndustrialX option provides support when creating individual ActiveX Controls with Visual Basic. To ensure the ability of WinCC to function properly, you should test these controls at length before using them.

ActiveX Controls can be integrated into your WinCC picture using the Drag&Drop method.

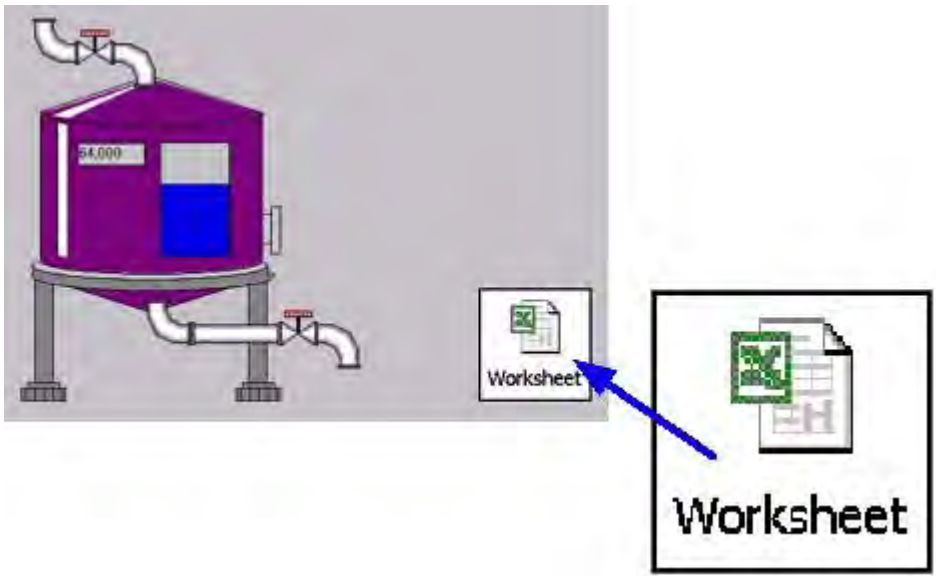


OLE

OLE is the acronym for "Object Linking and Embedding" and is a standard for data exchange between programs used in conjunction with Microsoft Windows. Here, data from one application are inserted into your own application. A typical example here would be a text into

which a graph is inserted and subsequently edited by double-clicking on it. Here, Windows opens the original graphics program to allow editing to take place.

This technique can, for example be employed in a WinCC project to integrate an Excel table into one of your pictures and use the data in the table as recipe data.



OPC

A form of OLE specially developed for the automation technique is "OLE for Process Control", abbreviated OPC. Using this standard, any OPC-enabled components communicate with one another. You do not have to go into great detail with the interfaces during configuration.

WinCC can either be an OPC client or an OPC server. When operating as an OPC client, WinCC will access the data of other applications.

When WinCC is used as an OPC server, the WinCC data will be made available to other applications.
The following types of access are possible:

- Access to WinCC tags through the WinCC OPC DA server.
- Access to the archive system through the WinCC OPC HDA server.
- Access to the message system through the WinCC OPC A&E server.

SQL

SQL can be used to access the contents of the WinCC databases.

- SQL is the acronym for Structured Query Language, a standardized language for accessing databases.

The queried data can either be used in other applications or imported into other databases.

It should be remembered in this instance that accessing the databases has a direct effect on the database and the ability of a WinCC project to work.

API

WinCC has a C-programming interface. Consequently, individual applications can influence WinCC, can access configuration runtime data or intervene in the process. The ODK option (Open Development Kit) contains documentation for this interface and numerous examples.

ANSI-C

WinCC supports the use of functions and actions for dynamization of the processes in your WinCC project. These functions and actions are written in ANSI-C.

VBS

In WinCC, the programming language VBScript is available to you as an application programmer interface, in addition to C-Script. With VBScript (VBS), provides access to tags and objects of the graphical runtime system at runtime and enables execution of picture-independent actions. Apart from the specific WinCC applications, it is also possible to use the general functionality of VBS for access to the Windows environment.

VBA

The VBA (Visual Basic for Application) interface is another option for customizing WinCC. In Graphics Designer you can automate frequently recurring work steps with VBA while you are configuring. Furthermore, you can fall back on products of the Microsoft Office family that support VBA.

ADO/OLE DB

You can access the archive database of WinCC through the ADO/OLE DB interface.

See also

Integration into Corporate IT Solutions (Page 32)

Integration into the SIMATIC Environment (Page 30)

System Components (Page 27)

2.3.6 Licensing

Modular Licenses

In order to be flexible toward all requirements, not only WinCC software is organized in modular form but licenses as well. The release of licenses is referred to as licensing. It takes place within the framework of the WinCC installation by a special license key data carrier. The license may also be transmitted by the user after the fact using the Automation License Manager.

Differentiation is made between RC licenses (Runtime and Configuration) and pure RT licenses (Runtime only). If you wish to operate WinCC on a computer in Runtime only, without effecting any configurations from it, you will only require an RT license for this computer.

An additional tier of licenses is based on the maximum number of process tags and archive tags usable in RT. For example, a maximum of 2,048 process variables can be used in RT with the "WinCC RC (2048)" license. Generally, these modular license permit the use of 512 archive variables without needing your own archive license.

Missing Licenses

Missing licensing will cause WinCC to run in demo mode.

If WinCC switches into demo mode, all open editors will terminate after one hour. If RT is activated at this time, WinCC Explorer and the Runtime system will continue to run. However, if RT is not activated, WinCC Explorer will terminate as well. After an editor restart, you will be permitted to work for an additional 10 minutes.

Upon the start of Runtime (License RTxxx), a box appears requesting acknowledgment and acquisition of a valid license. This message will be redisplayed every 10 minutes and must be acknowledged. If the message window is moved, the window reappears again, centered, after 30 minutes at the most. As long as you are in Runtime, WinCC Explorer is not terminated. On exiting from runtime, WinCC Explorer is also closed.

Options are also enabled using special licenses. If a license is missing for an option used in a project, the demo mode is automatically activated. This happen independent of whether or not other licenses are available, and it always affects the full functionality of WinCC.

Exceeding the Maximum Number of Tags

If your project exceeds the maximum number of process tags and/or archive tags available for your license, a switchover into demo mode will take place. You will require an upgrade license in this case.

With an upgrade license, additional process tags ("PowerTags") or archive tags ("ArchTags") are enabled.

The number of tags is checked only during server operation. Affected are computers which function as servers only, or function as server and client simultaneously (single-user system). On pure clients with an existing license, the maximum number of tags is always enabled.

See also

How WinCC Works (Page 50)

Setting Up and Administering Projects (Page 70)

WinCC Function Chart (Page 65)

System Components (Page 27)

2.3.7 Typical configurations

2.3.7.1 Typical configurations

Flexibility

Various system configurations can be implemented using WinCC. You are not restricted to a configuration that has already been selected; single-user applications can be changed to multi-user applications even at a later point in time. This will facilitate the step by step expansion of your project.

Configurations

In principle, the following system configurations are possible when working with WinCC:

- Single-user System
- Multi-user systems with one server and several clients
- Distributed system with several servers
- Central Archive Server
- Central Long-term Archive Server
- Redundant system for maximum availability
- Web Client system to connect clients via intranet or Internet

See also

Single-User System (Page 38)
Multi-User System (Page 40)
Distributed System (Page 41)
Central Archive Server (WinCC CAS) (Page 43)
Central Long-Term Archive Server (Page 45)
Redundant Systems (Page 46)
Web Client System (Page 48)

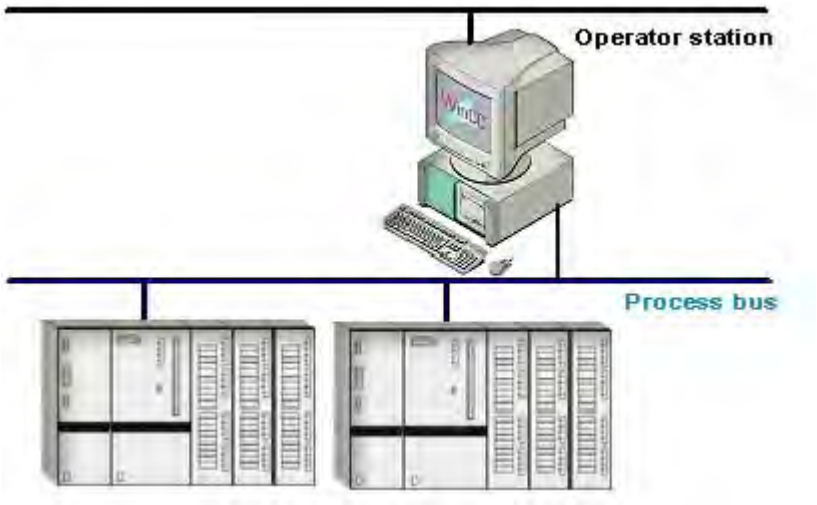
2.3.7.2 Single-User System

Mode of Operation

The simplest configuration is the single-user system. The PC on which WinCC has been installed also functions as a server for the WinCC databases and as a client which accesses these databases.

A single-user system is connected to the automation systems over a process bus.

The PC can also be integrated into a LAN.



Areas of Application

Single-user systems are most frequently employed in the area of production but can also operate and monitor independent subprocesses or plant parts within larger projects.

Software Requirements

In the case of single-user operation, it will be necessary to install a license for the basic WinCC system on the PC. The maximum number of process tags that are available will depend on the license.

See also

Licensing (Page 36)

Web Client System (Page 48)

Redundant Systems (Page 46)

Central Long-Term Archive Server (Page 45)

Central Archive Server (WinCC CAS) (Page 43)

Distributed System (Page 41)

Multi-User System (Page 40)

2.3.7.3 Multi-User System

Mode of Operation

A multi-user system consists of a server and several operator stations (clients). An individual server with process driver connection is normally configured in the case of small systems in which a distribution of the data over several servers is not necessary.

Several operator stations access the project on a server with process driver connection. The individual operator stations can execute the same or different tasks.

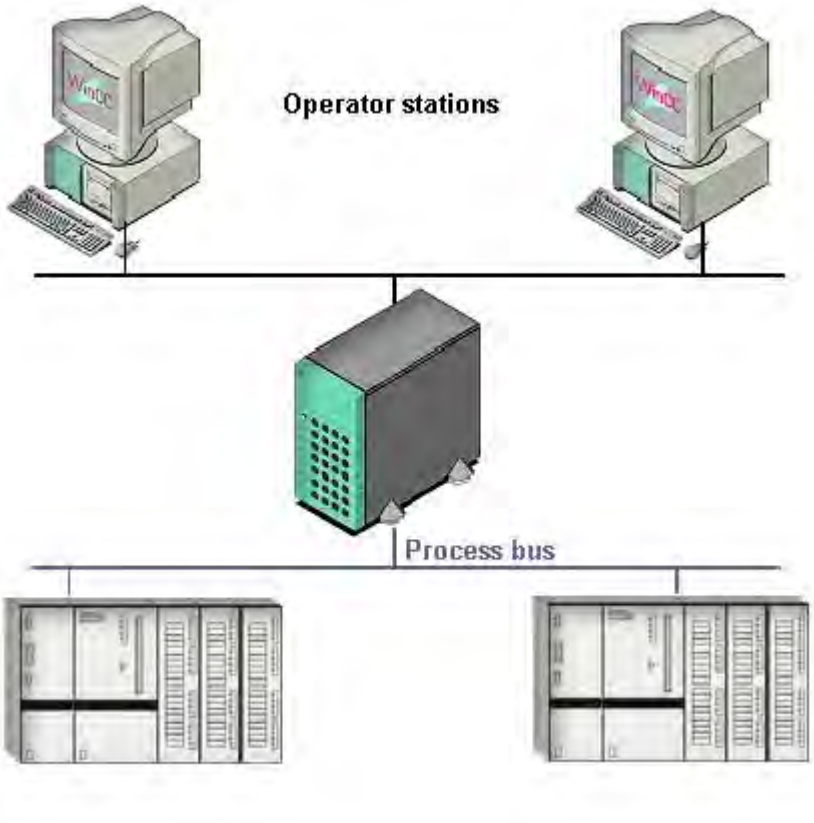
Clients and server are linked via a LAN or ISDN. The standard protocol TCP/IP is used for communication with the server.

A process bus is used to connect the server to the automation systems.

In the case of a multi-user system, it is not necessary to configure the clients. The server is responsible for all common functions:

- Connecting the automation systems
- Coordination of the clients
- Providing the clients with process values, archive data, messages, pictures and protocols

The central services of the server are availed off by all clients. Each client increases the workload of the server.



Areas of Application

You require multi-user systems in the following instances:

- You wish to display different information relating to the same process on different operating consoles. You could, for example use one operating console to display the process pictures and a second operating console exclusively for the purpose of displaying and acknowledging messages. The operating consoles may be located side by side or in totally different locations. The data is provided by the server.
- You wish to operate a process from several locations, e.g. along a production line.

User authorization is issued to define the functions that are available to an operator on a certain operating console.

Maximum Number of Clients on a Multi-user System

Up to 32 clients can be operated on one server.

Software Requirements

In order to operate the client-server mode, the license for the WinCC Basis System, the WinCC Option server and a Microsoft Windows 2003 server operating system must be installed. The smallest runtime license (Runtime 128) is sufficient for one client.

See also

Licensing (Page 36)

Web Client System (Page 48)

Redundant Systems (Page 46)

Central Long-Term Archive Server (Page 45)

Central Archive Server (WinCC CAS) (Page 43)

Distributed System (Page 41)

Single-User System (Page 38)

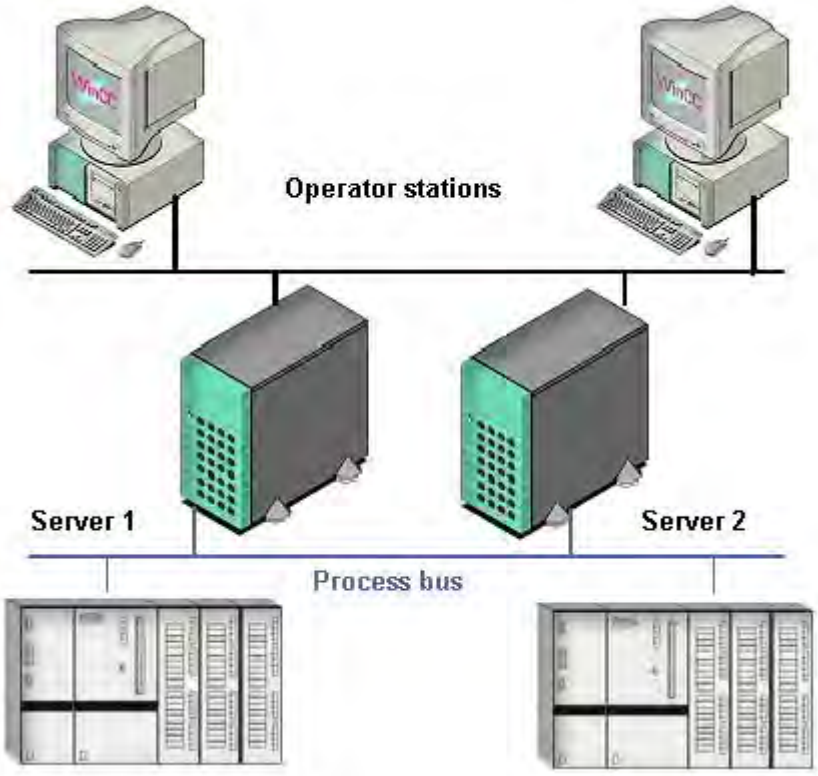
2.3.7.4 Distributed System

Mode of Operation

WinCC can be used to configure distributed systems with clients which have views on various servers and, therefore, operate and monitor large systems efficiently. As a result of distributing tasks over several servers, the load applied to individual servers is relieved. This achieves a better system performance realize larger typical applications.

Distributed systems are used, for example:

- In large systems where several operator and monitoring stations (clients) are required for the same tasks.
- When you want to distribute different operator and monitor tasks to several operator stations, such as a central client, for displaying all the messages of one system.



Client/Server Scenarios

Using WinCC you can implement different client-server scenarios depending on the application:

- Technological distribution: In the case of large systems, technological distribution is normally used in order to display the system in a structured, realistic way. Each server takes over a technically restrictable area of a system, e.g. a certain press or dry unit.
- Functional distribution: However, an individual WinCC server assumes only a single specific task type, such as message processing or archiving.
- Use of a file server in order, for example, to save the system configuration centrally on a file server and to open this system configuration from a WinCC engineering station via the network.
- Use of server/server communication: A server accesses the process data of another server.

Regardless of the scenario, clients have no direct access or link to the process. The clients access the data of certain servers to operate and observe the process.

Clients in Distributed Systems

Clients can be used in different ways on distributed systems. A client can view one or more servers. Usage depends on the tasks.

With distributed systems, from the client in WinCC you can e.g.:

- Access data on several servers.
- Remotely configure the server projects from the accessing clients.
- Automatically distribute updated data from the server projects to the relevant computer in the network.

Maximum Number of Servers and Clients in a Distributed System

You can configure mixed systems with WinCC, i.e. use clients and WebClients together in your distributed system.

If you only use clients, in a WinCC network up to 32 parallel clients can access a server. In Runtime, a client may access up to 12 servers / server pairs.

When using WebClients, the limit is up to 51 clients (1 client and 50 WebClients). In such a system a maximum of 24 servers in the form of 12 redundant server pairs can be used.

Software Requirements

In order to operate the client-server mode, the license for the WinCC Basis System, the WinCC Option server and a Microsoft Windows 2003 server operating system must be installed. The smallest runtime license (Runtime 128) is sufficient for one client.

See also

Licensing (Page 36)

Web Client System (Page 48)

Redundant Systems (Page 46)

Central Long-Term Archive Server (Page 45)

Central Archive Server (WinCC CAS) (Page 43)

Multi-User System (Page 40)

Single-User System (Page 38)

2.3.7.5 Central Archive Server (WinCC CAS)

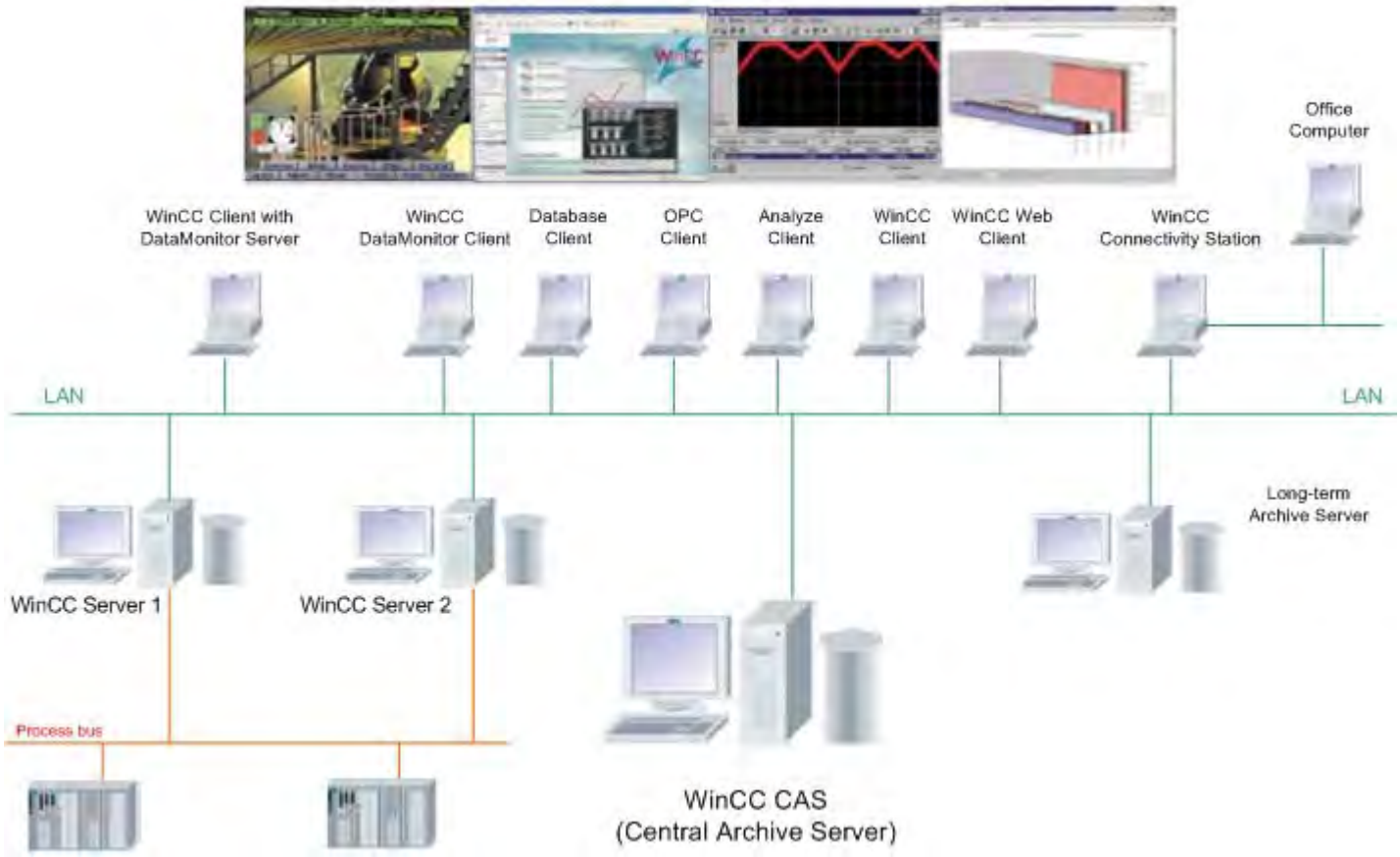
Mode of Operation

WinCC Central Archive Server (WinCC CAS) is used to centrally archive important process data of multiple WinCC servers and other data sources. In this way, the process data for analysis and visualization are made available throughout the company.

WinCC clients have access to the entire data of the system independent of whether these are located on the WinCC CAS or are still on the WinCC servers. Data access is transparent. WinCC process images can also display data via WinCC Trend Control or WinCC Alarm Control.

Data security is thus consistently ensured while transferring data to the central archive. In case of network failures, data is buffered on the WinCC server. Further, WinCC CAS can also be maintained redundantly.

The WinCC client or the connectivity station is the central access point to the system. The connectivity station can function as server for the system data; the WinCC client can also serve as the Web Navigator Server or Data Monitor Server. The WebCenter included in the DataMonitor enables comfortable display and evaluation of data.



See also

Web Client System (Page 48)

Licensing (Page 36)

Redundant Systems (Page 46)

Central Long-Term Archive Server (Page 45)

Distributed System (Page 41)

Multi-User System (Page 40)

Single-User System (Page 38)

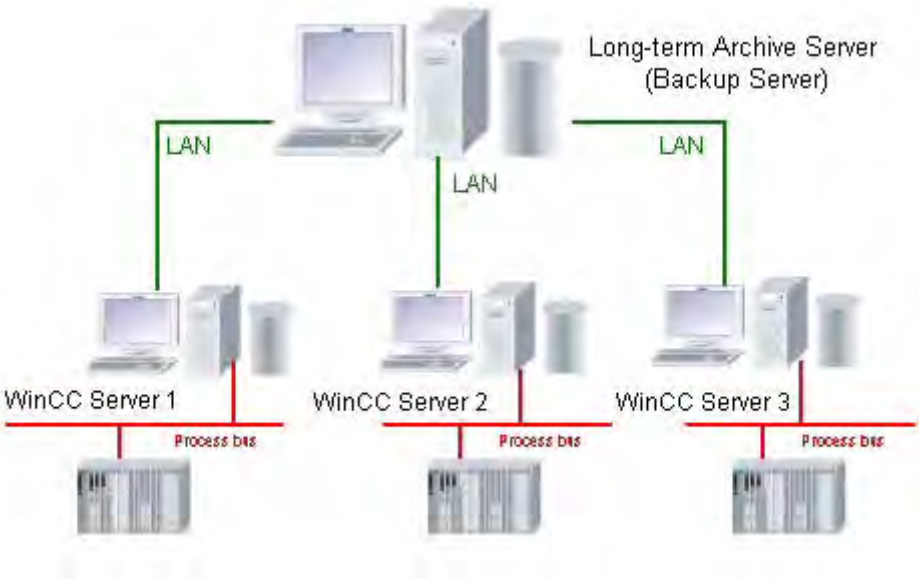
2.3.7.6 Central Long-Term Archive Server

Mode of Operation

A central, long-term archive server is implemented, for example, to make backup copies of the database files of process value archive once a month.

The long-term archive server is realized in the form of a server without a connection to the process on which the server with connection to the process can transfer its archive backups. There are various methods with which to access the swapped archive data:

- Remote access (LAN, WAN, Internet) with the browser-based DataView of the WinCC/ DataMonitor WebEdition option
- Access using the WinCC OLE-DB provider
- Copying back the database files on a WinCC runtime system
- Access by using WinCC process screens.



See also

Redundant Systems (Page 46)

Licensing (Page 36)

Web Client System (Page 48)

Central Archive Server (WinCC CAS) (Page 43)

Distributed System (Page 41)

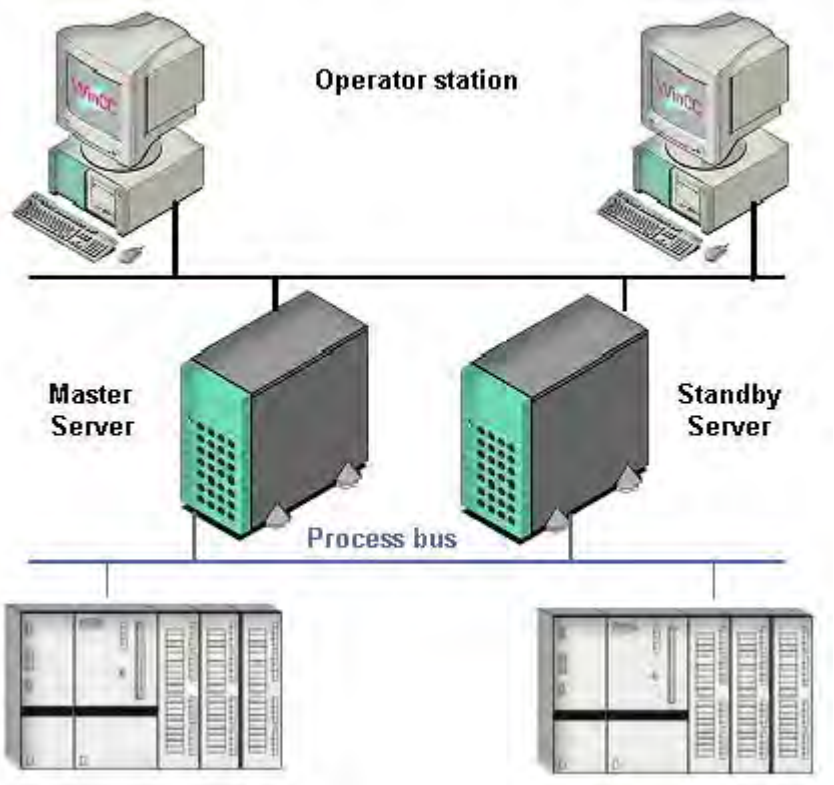
Multi-User System (Page 40)

Single-User System (Page 38)

2.3.7.7 Redundant Systems

Mode of Operation

A second redundant server can be operated for each of the existing servers. All process values and messages will then be processed and archived on both servers. If one of the servers fails, the clients that are connected will automatically be rerouted to the other server. The process can be operated and monitored on the clients almost without interruption.



Areas of Application

Redundant systems increase availability. Such systems are always employed when it is essential to guarantee that the archiving of process data and messages will not be interrupted in the event of a server failure.

Redundant servers can be integrated into a multi-user system or into a distributed system.

Procedure in the Event of a Fault

If operation is fault-free, both servers run completely parallel. The automation systems pass on all data to both servers parallel. Each server processes its own data.

If one of the servers fails, the clients that are connected to this server will be rerouted to the redundant server. The switch of the clients from the default (master) server to the partner server during a server failure is performed automatically by the system. The following factors cause a switch of servers:

- Network connection to server failed
- Server failure
- Malfunction of process connection
- The Application Health Check function has detected a faulty application and triggers the switch.

The switch guarantees that no data are lost and the process can continue to be operated.

When the failed server has been returned to an operational state, WinCC will proceed to synchronize the server by passing on all the data that was recorded by the redundant server since the fault occurred.

Software Requirements

In the case of redundant servers, it will be necessary to install a license for the WinCC Redundancy option on each server in addition to the license for the basic WinCC system.

See also

Licensing (Page 36)

Web Client System (Page 48)

Central Long-Term Archive Server (Page 45)

Central Archive Server (WinCC CAS) (Page 43)

Distributed System (Page 41)

Multi-User System (Page 40)

Single-User System (Page 38)

2.3.7.8 Web Client System

Mode of Operation

When using a Web Client system you will be able to operate and monitor your process via the Internet or an intranet.

Each web client has to identify himself when accessing the WinCC Web Navigator Server. The web client will then be able to monitor or control the process in accordance with his access permissions. The WinCC Web Navigator is based on the standard HTTP protocol and supports all common security mechanisms.

The web clients will automatically be notified of any changes to the process by the WinCC Web Navigator Server. The current process values and messages are always displayed on the web clients.

A web client can simultaneously access up to twelve servers through the WinCC Web Navigator Server. This means that cross-system evaluations can be performed.

Differentiation is made between Web Navigator control clients (operator and monitor) and management clients (monitor).

Areas of Application

Web clients are used in the following areas:

- Where remote access can only be established over the Internet or intranet.
- To facilitate mobile remote diagnosis and fault correction.
- To establish a large number of clients at low cost.
- In the case of applications that have a decentralized structure or only sporadic access to process information.
- To implement thin-client solutions using terminal/server technologies such as for mobile solutions like handhelds, PDAs or rugged on-site operator stations and operator panels.
- To support Excel evaluations by means of WinCC online/archive data on the Internet or an intranet. The DataMonitor is used for evaluations.

Special Configuration Features

The integrated Web Publishing Wizard automatically converts your pictures into a format which is suitable for the web.

When configuring, attention must however be paid to some special aspects pertaining to web access. You will find more information about WinCC Web Navigator in the documentation.

Software Requirements

In the case of WinCC Web Navigator server operation, it will be necessary to install a license for the WinCC Web Navigator option on the server in addition to the license for the basic WinCC system.

Licenses are available for 3, 10, 25 or 50 clients that can simultaneously access the Web Server. The Web Navigator clients can access several, different Web Navigator servers simultaneously.

There is a per seat license especially for remote diagnostics, where web servers are accessed only sporadically. The Web Navigator license in this case resides on the client (Web Navigator diagnostic client), which can access up to 12 servers simultaneously. The license for the basic WinCC system does not have to be installed on the client.

The WinME, WinNT, Win2000, and WinXP operating systems support the web clients. Internet Explorer 6 or a later version must be installed on the clients. The clients do not have to be installed separately but fetch essential components over the web from their Web Navigator server.

See also

Licensing (Page 36)

Redundant Systems (Page 46)

Central Long-Term Archive Server (Page 45)

Central Archive Server (WinCC CAS) (Page 43)

Distributed System (Page 41)

Multi-User System (Page 40)

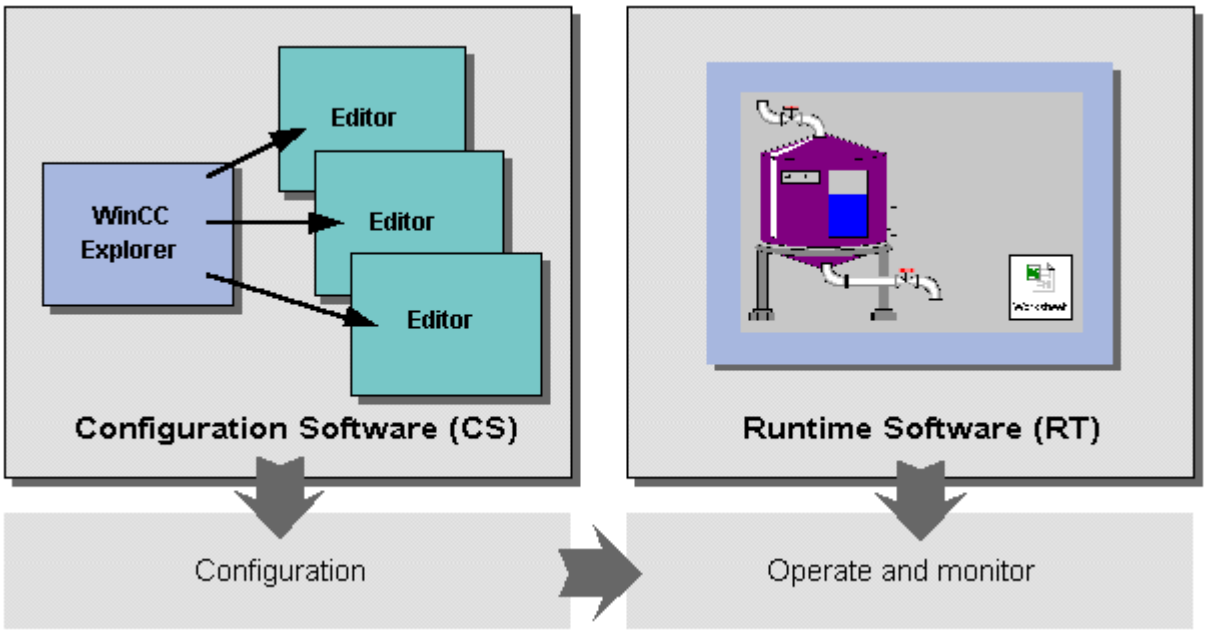
Single-User System (Page 38)

2.4 How WinCC Works

2.4.1 How WinCC Works

Structure of WinCC

WinCC is a modular system. Its basic components are the Configuration Software (CS) and Runtime Software (RT)



Configuration Software

WinCC Explorer will open immediately after you start WinCC. WinCC Explorer forms the core of the Configuration software. The entire project structure is displayed in WinCC Explorer. The project is also administered here.

Special editors which can be called from WinCC Explorer have been provided for configuration purposes. Each editor is used to configure a special WinCC subsystem.

The most important WinCC subsystems are:

- The Graphics System – the editor that is used to create pictures is known as the Graphics Designer.
- Alarm Logging System – the editor used for the configuration of messages is referred to as Alarm Logging.
- The Archiving System – the editor used to identify the data to be archived is referred to as Tag Logging editor.
- The Report System – the editor that is used to create report layouts is known as the Report Designer.

- User administration – the editor that is used to administer users is, as the name implies, known as the User Administrator.
- Communication – this is configured directly in WinCC Explorer.

All configuration data is saved in the CS database.

Runtime Software

The Runtime software allows the user to operate and monitor the process. It is primarily used to execute the following tasks:

- It reads the data that has been saved in the CS database
- It displays pictures on the screen
- It communicates with the automation systems
- It archives current runtime data, e.g. process values and message events
- It controls the process, e.g. through setpoint input or switching On and OFF

Performance Data

The performance data will be directly determined by the PC hardware that is used and the manner in which the system is configured. You will find examples of different system constellations in the WinCC Information System at Performance Data.

See also

Graphics System (Page 51)

WinCC Function Chart (Page 65)

Communication (Page 62)

Report System (Page 60)

Archiving System (Page 57)

Alarm Logging (Page 54)

System Components (Page 27)

2.4.2 Graphics System

Graphics System Tasks

The screens depicting the process in runtime are created with the graphics system.

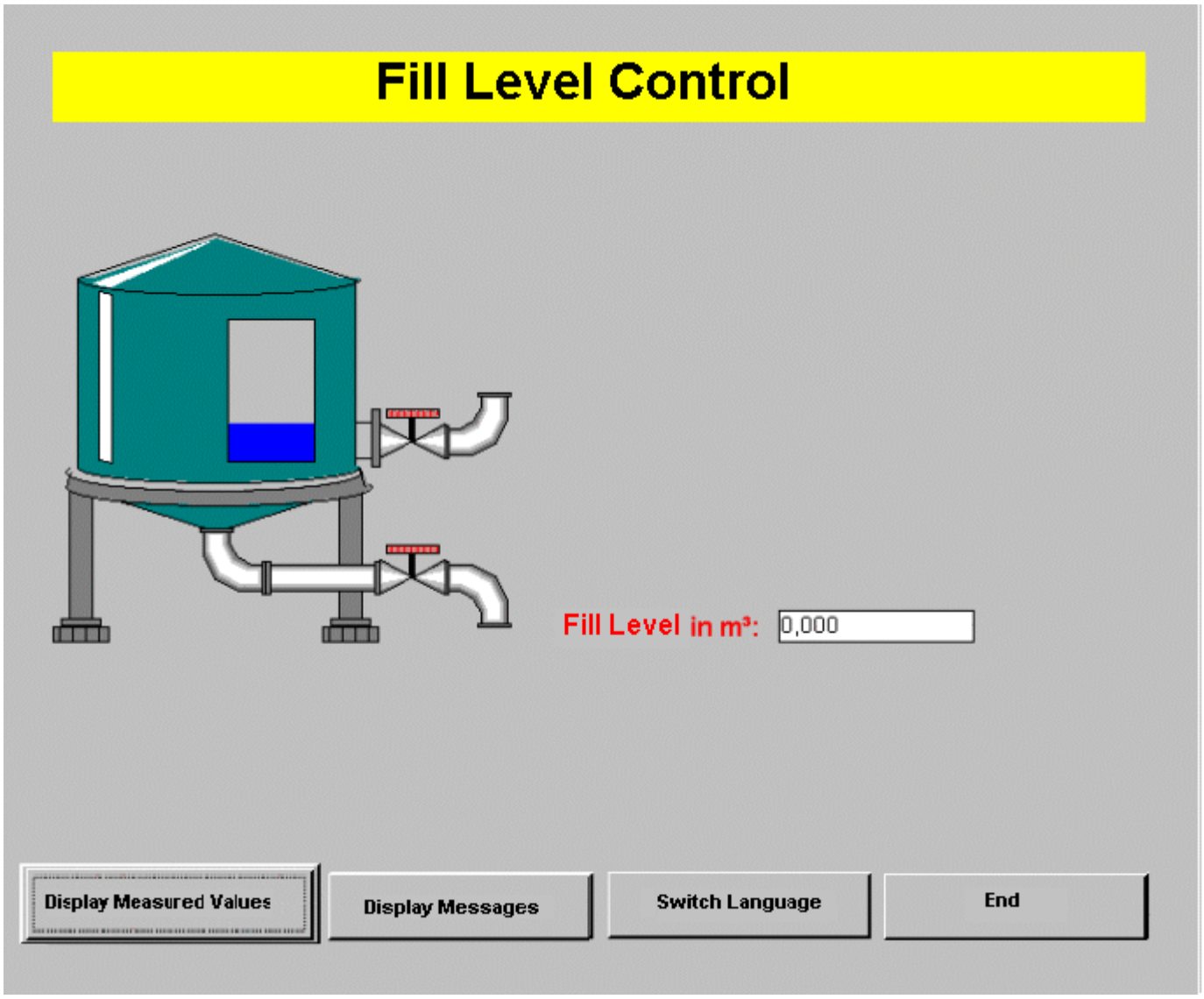
The Graphics System handles the following tasks:

- It displays static and operator-controllable picture elements, such as texts, graphics or buttons
- It updates dynamic picture elements, e.g. modifies the length of a bar graph in relation to a process value
- It reacts to operator input, e.g. the clicking of a button, or the entry of a text in an input field

The Components of the Graphics System

The Graphics System is made up of Configuration and Runtime components:

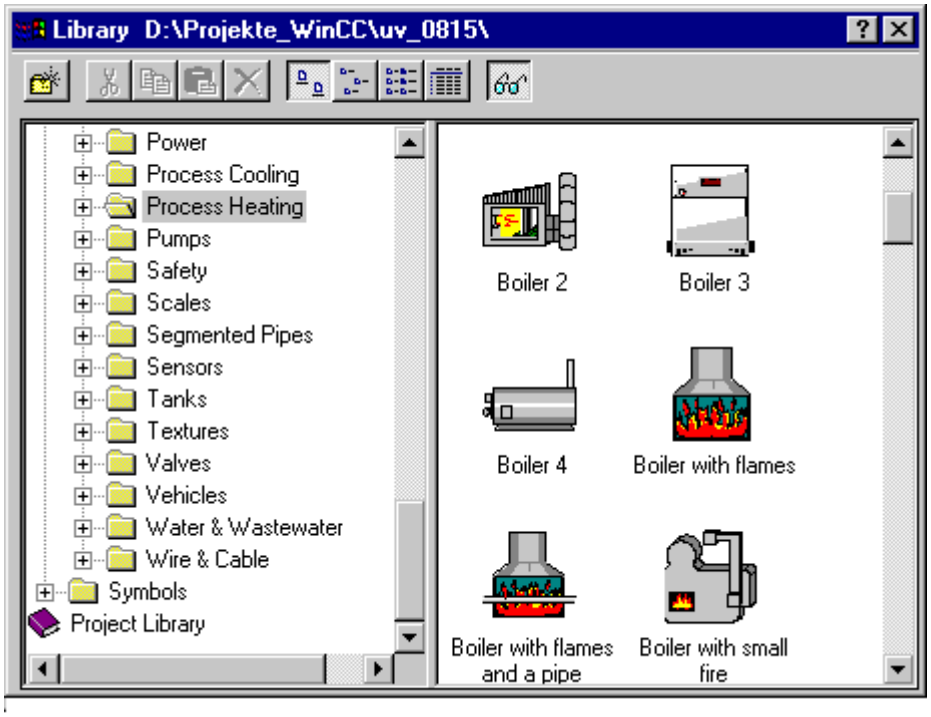
- The Graphics designer is the configuration component of the Graphics System. The Graphics Designer is the editor that is used to create pictures.
- Graphics Runtime is the runtime component of the Graphics System. Graphics Runtime displays the pictures on the screen in runtime and administers all inputs and outputs.



Libraries

Module libraries help you to create your pictures in a particularly efficient manner. The objects in the library can be inserted into your pictures during configuration using the Drag&Drop method.

- The module libraries that have been provided contain a large selection of precompiled objects that have been sorted in accordance with themes, such as valves, motors, cables, display instruments and much more.
- You can store homespun objects on the project library and reuse them as often as you like.



VBA in Graphics System

With VBA you can customize the functionality of the graphics system.

When you use VBA, you can

- Automate frequently recurring work steps during configuration
- Create user-defined menus and toolbars
- Replace with VBA macros all actions that would otherwise be executed with the mouse.
- React to events that occur in Graphics Designer or in the picture when you wish to create a new object in the picture
- Dynamize properties and events of pictures and objects.
- Fall back on products of the Microsoft Office family that support VBA. This means that you have an opportunity to read values from an Excel table and then assign them to object properties.

Dynamize Process Pictures

WinCC features a wide range of options for dynamizing the graphic objects of a process picture.

- Dynamizing with the Dynamic Wizard:
  When you execute a wizard, preconfigured C actions and trigger events are defined and transferred to the object properties.
- Dynamizing by means of tag connection:
  Thus, for example, the background color of an object can be directly influenced by a tag.
- Dynamizing with a direct connection:
  This type of dynamics can be used to react to events.
- Dynamizing with the dynamic dialog box:
  The Dynamic dialog box can be used to monitor the state of a tag, for example.
- Dynamizing with a VBS action:
  The VBS action can execute when a picture is called, such as opening a login dialog box.
- Dynamizing with a C action:
  C actions can be used to dynamize object properties and to react to events such as the change in color of a display element when a tag limit value is exceeded.

See also

Reacting on Input (Page 76)

Visualizing Processes (Page 73)

WinCC Function Chart (Page 65)

2.4.3 Alarm Logging

Alarm System Tasks

Alarms inform the operator about process malfunctions and errors. They help to detect critical situations early and to avoid downtimes.

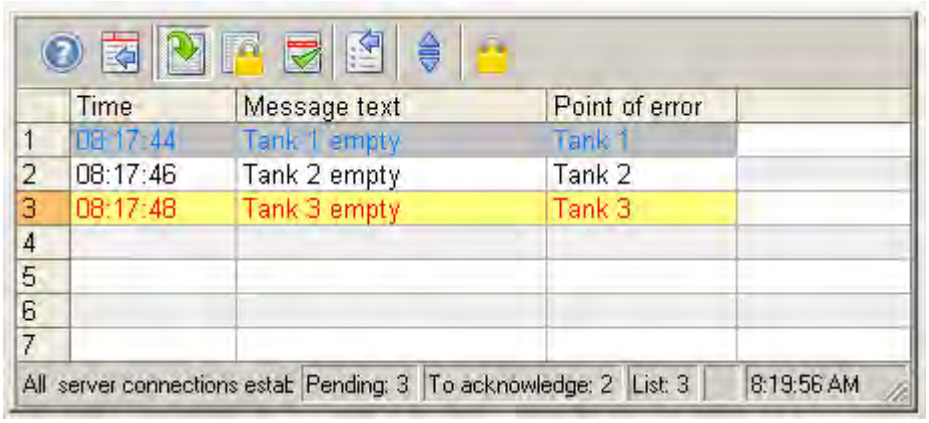
During configuration, define the events which should trigger process messages. An event, for example, can be that a certain Bit in a PLC is set or that a process value exceeds a defined limit value.

Components of the Alarm System

The alarm system consists of configuration and runtime components:

- The configuration component of the alarm system is the Alarm Logging editor. Alarm Logging is used to define when and what type of an alarm is to be displayed with what content. The Graphic Designer also disposes of a special display object, the WinCC Alarm Control, which is used to display messages.
- Alarm Logging Runtime is the runtime component of the message system. When in runtime, Alarm Logging Runtime is responsible for executing the defined monitoring tasks. It also controls the message output operations and administers the acknowledgement of these messages.

The messages are displayed in WinCC AlarmControl in tabular form.



Message Block

The content of a message is comprised of the message blocks. Each message block corresponds to one column in the tabular display in WinCC Alarm Control. You can define which message blocks are contained in your messages.

There are three groups of message blocks:

- System blocks with system data, e.g. date, time, message number and status
- Process value blocks with process values, e.g. current fill levels, temperatures or rotational speed
- User text blocks with explanatory texts, such as the message text containing information relating to the location and cause of a fault

Basic Statuses of a Message

A distinction is made between three basic types of message status in WinCC:

- A message will retain its "Active" status until such time as the initiating event no longer exists, i.e. the cause of the message no longer exists.
- As soon as the cause no longer exists the message will adopt the status "Cleared".
- A message can be configured in such a way that the operator has to acknowledge it. The message will then adopt the status "Acknowledged".

The current status of each message, "Active", "Cleared" or "Acknowledged", is shown in the message display. A different color is used for each status.

Group Messages

During configuration, any required number of messages can be summarized in one group message. The group message will appear as soon as at least one of the assigned single messages is queued (logical OR). The group message will disappear when none of the single messages are queuing.

Group messages can be employed to provide operators with a clearer overview of the system and to simplify certain situations.

Message Classes

During configuration, you will have the option of assigning each message to a message class. This has the advantage that you can then make numerous default settings for the entire message class instead of making these settings for each message individually.

Up to 16 message classes can be freely defined within a project.

Message Arching

With the Archive Management in WinCC you have the option to archive process values and messages for the specific documentation of operation and error states. Microsoft SQL Server is used for archiving.

The messages of so-called message events are archived. A message event describes the moment at which a message adopts a new status. In accordance with the three basic states of a message, there are the following message events:

- "Active"
- "Cleared"
- "Acknowledged"

You can save the message events in an archive database and archive as a message report on paper. The messages archived in the database can e.g. be output in a message window.

Archive Type

To archive messages, WinCC uses short-term archives of configurable size, which you can configure with or without backup.

You can choose any storage medium for the archive files within your network- for example, the hard disk of the WinCC server or a separate archive server.

See also

Creating and Archiving Messages (Page 86)

WinCC Function Chart (Page 65)

2.4.4 Archiving System

Tasks of the Archiving System

You can display current process values at any time. However, if you want to display the chronological progression of a process value, e.g. in a diagram or table, you will need access to past process values. These values are stored in process value archives.

In practice, such temporal displays are very important as they allow problems to be recognized very early on. If, for example, the fill level of a tank sinks over this period, this may be the result of a leak which will have to be attended to immediately to prevent production stoppages or to eliminate the danger of the machines being damaged.

Having access to individual historic process values also has another advantage. This can, for example, help to determine how high certain values were at a time when production problems were experienced.

Aside from process values, it is also possible to archive messages. You will find more information in the WinCC Information System at "Message system".

Components of the Archiving System

The process value archiving system consists of configuration and runtime components:

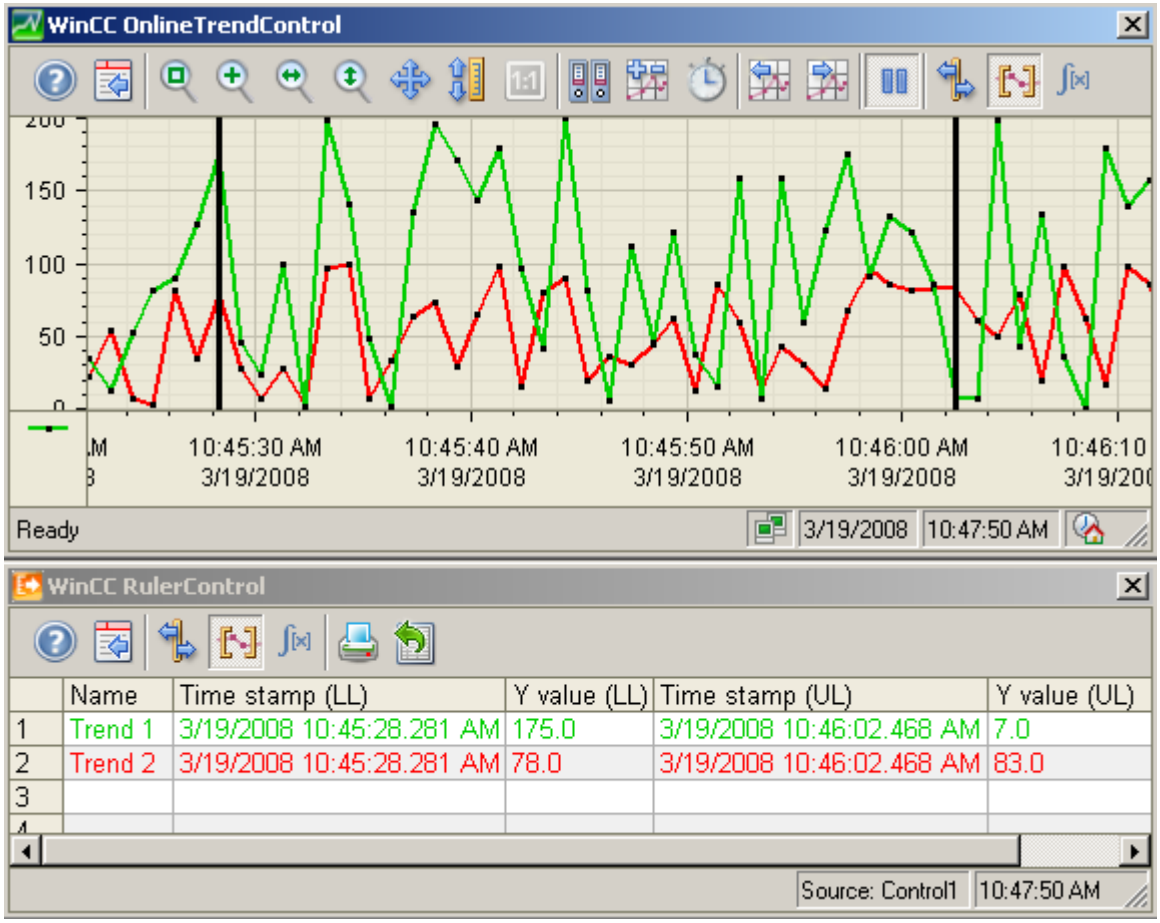
- The configuration component of the archiving system is the Tag Logging editor. There, you can configure process value archives as well as compressed archives, define acquisition and archiving cycles and select the process values to be archived.
- Tag Logging Runtime is the runtime component of the Archiving System. Tag Logging Runtime is responsible for writing the process values that have to be archived to the process value archive in runtime. The Tag Logging Runtime is also responsible for reading the archived process values from the process value archive when, for example, these are required for display purposes in one of the controls or for a further evaluation.

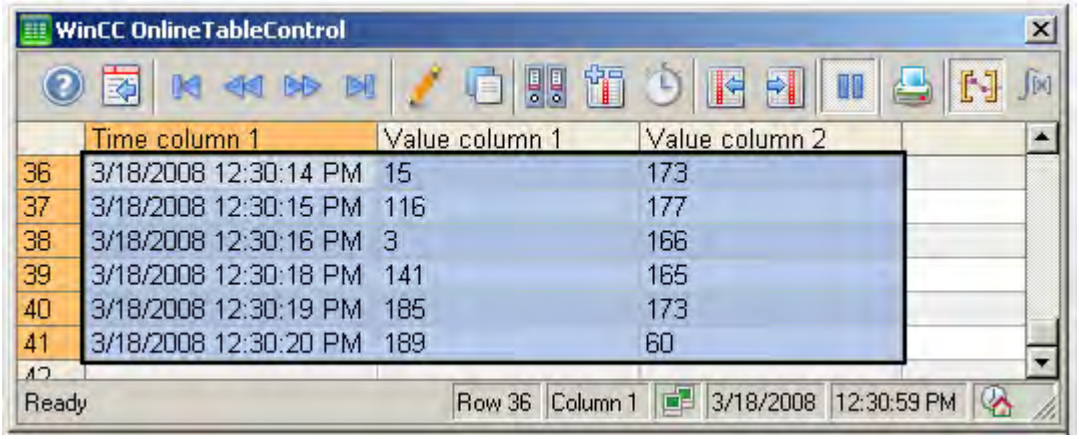
Output of Process Data

The process data can be displayed in a picture or output as a report.

- You can output the time course of process values in a picture. To do this there are three controls in the Graphics Designer. WinCC OnlineTrendControl and WinCC FunctionTrendControl for graphical display and WinCC OnlineTableControl for tabular display. With the WinCC TrendRulerControl you can display statistical information.
- You can print out process values from the archive database as a report. You can also choose between tabular and graphical for the output form. In the Report Designer, both output forms are available as predefined layouts.

The following screenshot shows a WinCC OnlineTrendControl with a WinCC RulerControl and a WinCC OnlineTableControl in Runtime.





Archiving Times

During configuration, you can define:

- which process values are to be archived
- the archive in which the process values are to be written
- the times at which the process values are to be archived

An archiving cycle and events are used to control archiving times. The archiving of process values can, for example, be effected in constant time cycles or only when a process value changes by a certain amount or percentage.

Archiving

Process values can be stored either on hard disk in the archive database or in the main memory of Tag Logging Runtime.

You can use different archiving methods to archive process values. You can therefore e.g. monitor a single process value at any point in time and make the monitoring dependent on certain events. You can archive quickly changing process values without increasing the system load in doing so. You can compress process values already archived to reduce the data volume.

Swapping Out the Archive

You can swap out process values from the archive database as a backup. All process values contained in a data puffer are swapped out. The time at which swapping out is performed depends on your configuration in ArchiveManager.

Software Requirements

In the WinCC Basis System, it is possible that 512 archive tags are already configured. For more archive tags than this, there is another classification of the licenses by the maximum number that can be configured.

See also

Creating and Archiving Messages (Page 86)

Archiving Process Values (Page 81)

WinCC Function Chart (Page 65)

2.4.5 Report System

Report System Tasks

The report system features two categories of reports:

- Configuration data in a report
- Runtime data in a report

Reports that relate to project documentation contain overviews of your configuration data, such as a table of all tags, functions and graphics used in your project.

Reports on runtime documentation document your process. Here are some of the options for this:

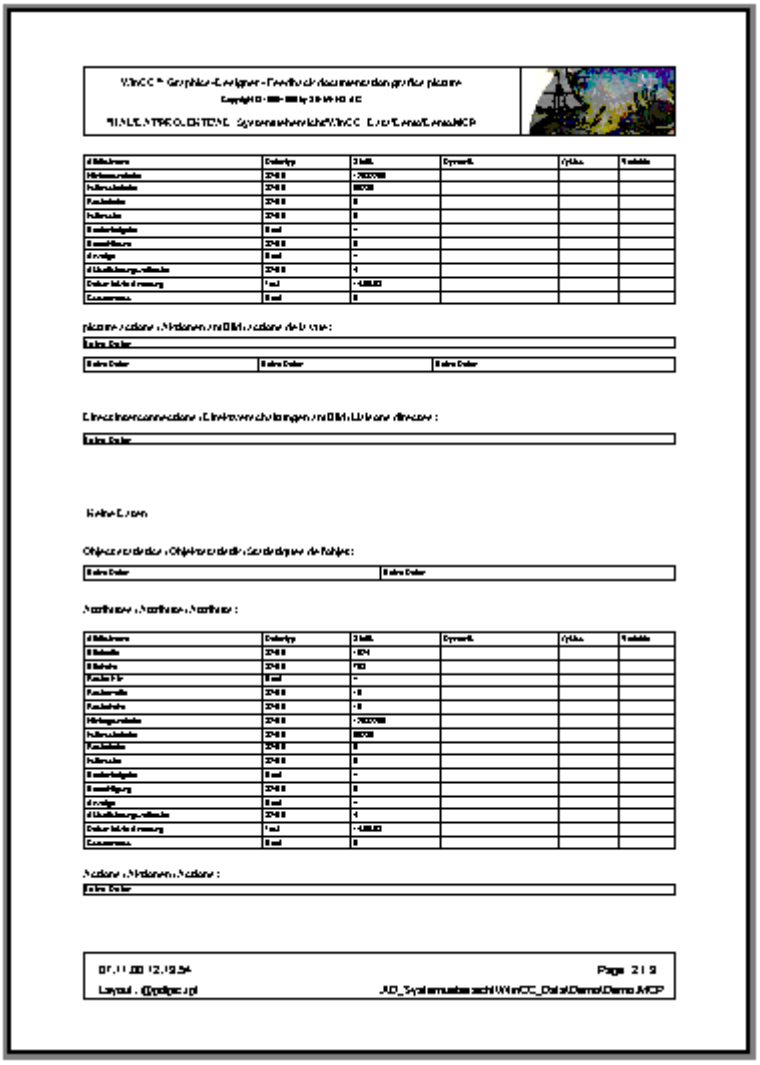
- A message sequence report outputs a chronological list of all messages. Printing is either effected page by page or on line-oriented printers immediately after the occurrence of the message event.
- An archive report outputs a list of all messages stored in a certain message archive
- A tag table documents the information and contents of tags in process value and compressed archives in tabular form
- Data from other applications not originating in WinCC can likewise be logged. There are various log objects available for integrating this kind of data in a WinCC log.

Components of the Report System

The report system consists of configuration and runtime components:

- The configuration component of the report system is the Report Designer. The Report Designer is used to adapt ready-made default layouts to your requirements or to create new layouts. The Report Designer is also used to create print jobs to initiate the output.
- Report Runtime is the runtime component of the Report System. The report Runtime fetches the data for printing from the archives or controls, and controls the print output.

The following illustration shows a simple report.



Print Jobs

The printing of project documentation reports is always effected by the operator using the Configuration Software.

You control runtime documentation report printing by means of print jobs. A print job determines:

- whether or not a report is printed and when it is printed
- the layout that is to be used for printing
- on which printer or in which file output is to be effected

Reports can be output in any of the following ways:

- time-driven – e.g. on an hourly or daily basis or at each change of shift
- event-driven – e.g. on exceeding a certain limit value
- on request – e.g. through key operation

See also

Documenting Processes and Events (Page 89)

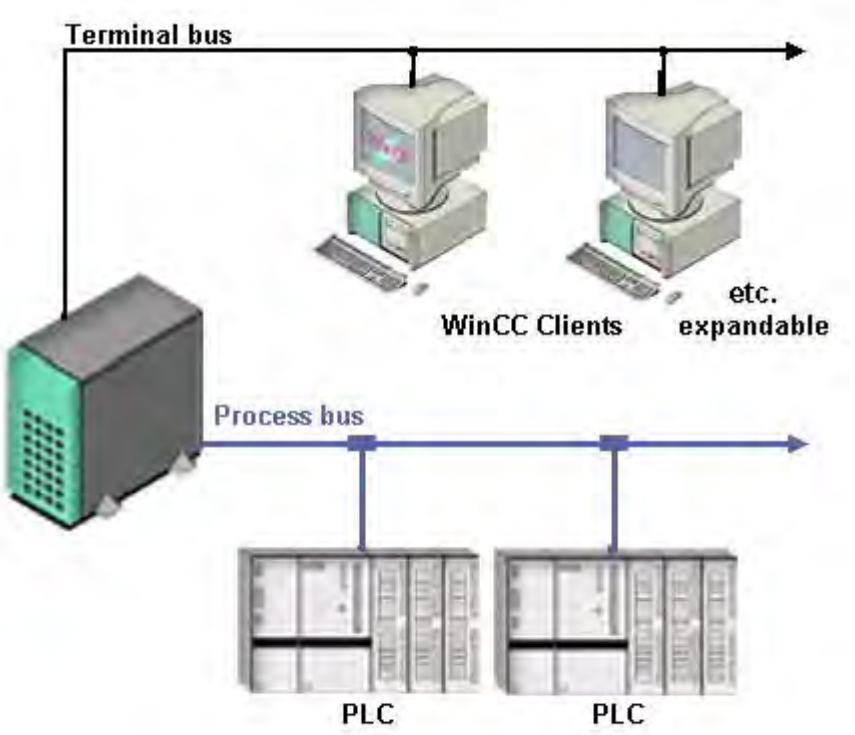
WinCC Function Chart (Page 65)

2.4.6 Communication

Communication Tasks

Communication between WinCC and the automation systems is effected via the respective process bus, e.g. Ethernet or PROFIBUS. Communication is managed by specialized communication drivers known as channels. WinCC has channels for the automation systems SIMATIC S5/S7/505 and manufacturer-independent channels such as PROFIBUS DP and OPC. Moreover there is a variety of optional channels available for all common controls as an option or add-on.

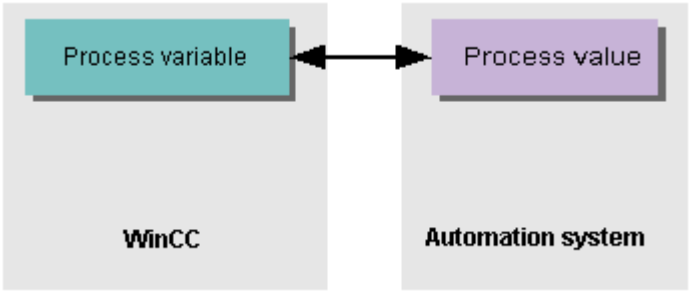
Communication with other applications, e.g. Microsoft Excel or SIMATIC ProTool, is effected with the assistance of the OPC (OLE for Process Control). When the WinCC OPC server is used, the data will be made available to other applications by WinCC. The data of other OPC servers can also be received by WinCC via the OPC client.



Communicating with the Automation Systems

Process tags form the link for data exchange between WinCC and the automation systems. Each process tag in WinCC corresponds to a certain process value in the memory of one of the connected automation systems. In runtime, the data area in which this process value is saved will be read out of the automation system by WinCC thus allowing the value of the process tags to be ascertained.

WinCC is also able to write data back into the automation system. This data is then processed by the automation system. In this manner, you can use WinCC to control process.



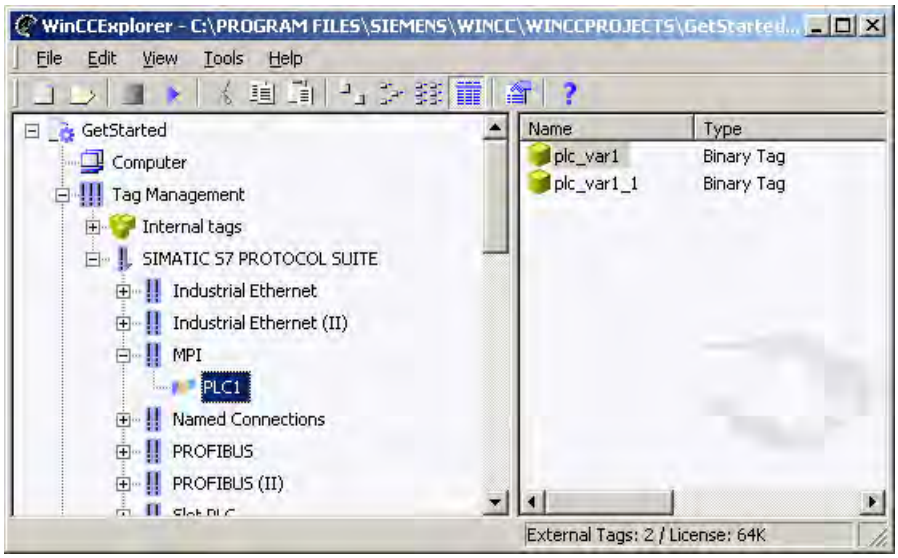
Communication via OPC

OPC clients can access WinCC data through the integrated OPC servers. The following types of access are possible:

- Access to WinCC tags through the WinCC OPC DA server.
- Access to the archive system through the WinCC OPC HDA server.
- Access to the message system through the WinCC OPC A&E server.

Channel Units, Logical Connections and Process Tags

Communication between WinCC and the automation systems is effected via logical connections. These logical connections are arranged in a hierarchical manner over several levels. These individual levels are reflected in the hierarchical structure of WinCC Explorer.



The communication drivers can be found at the highest level. These are also referred to as channels (e.g. the channel SIMATIC S7 PROTOCOL SUITE).

One or more protocols have been provided for communication via a channel. The protocol is used to determine the channel unit that is to be used (e.g. MPI). This channel unit is then used together with a certain protocol to access to a certain type of automation system.

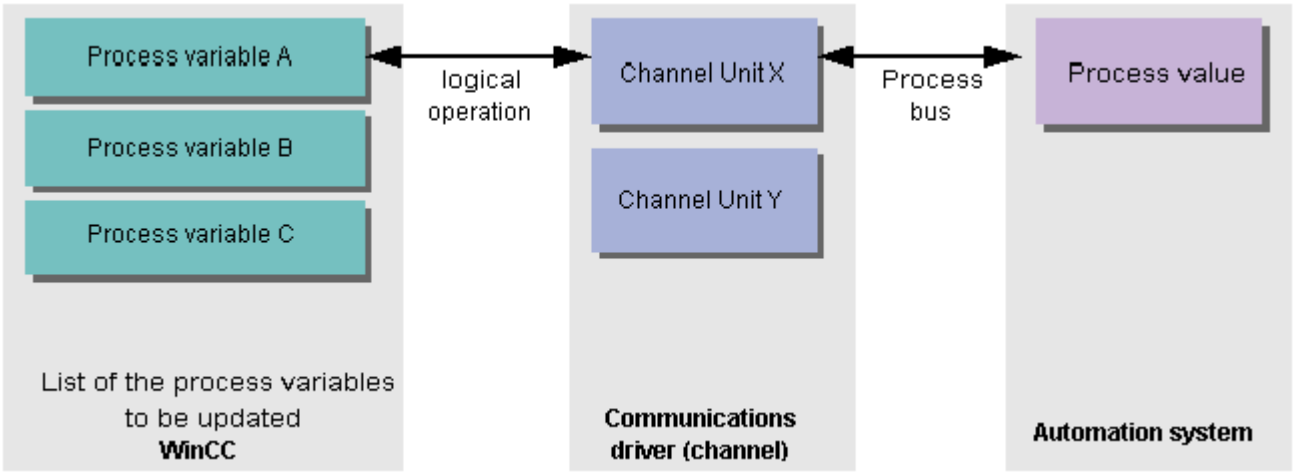
A channel unit can be used to establish logical connections to several automation systems which communicate via this channel unit (e.g. the automation system SPS1). A logical connection therefore represents the interface to an individual, defined automation system.

The process tags of the automation system are shown to the right of the data window in the case of each logical connection (e.g. the process tag MyTag1).

The Communication Process in Runtime

Up-to-date process values are required in runtime. Thanks to the logical connection, WinCC knows which automation system the process tags are located in and which channel is being used to process the data traffic. The process values are transferred via the channel. The data that is read in will be stored in the working memory of the WinCC server.

The necessary communication steps are optimized by the channel in such a way that data traffic via the process bus is reduced to a minimum.



See also

Accessing Process Values (Page 78)

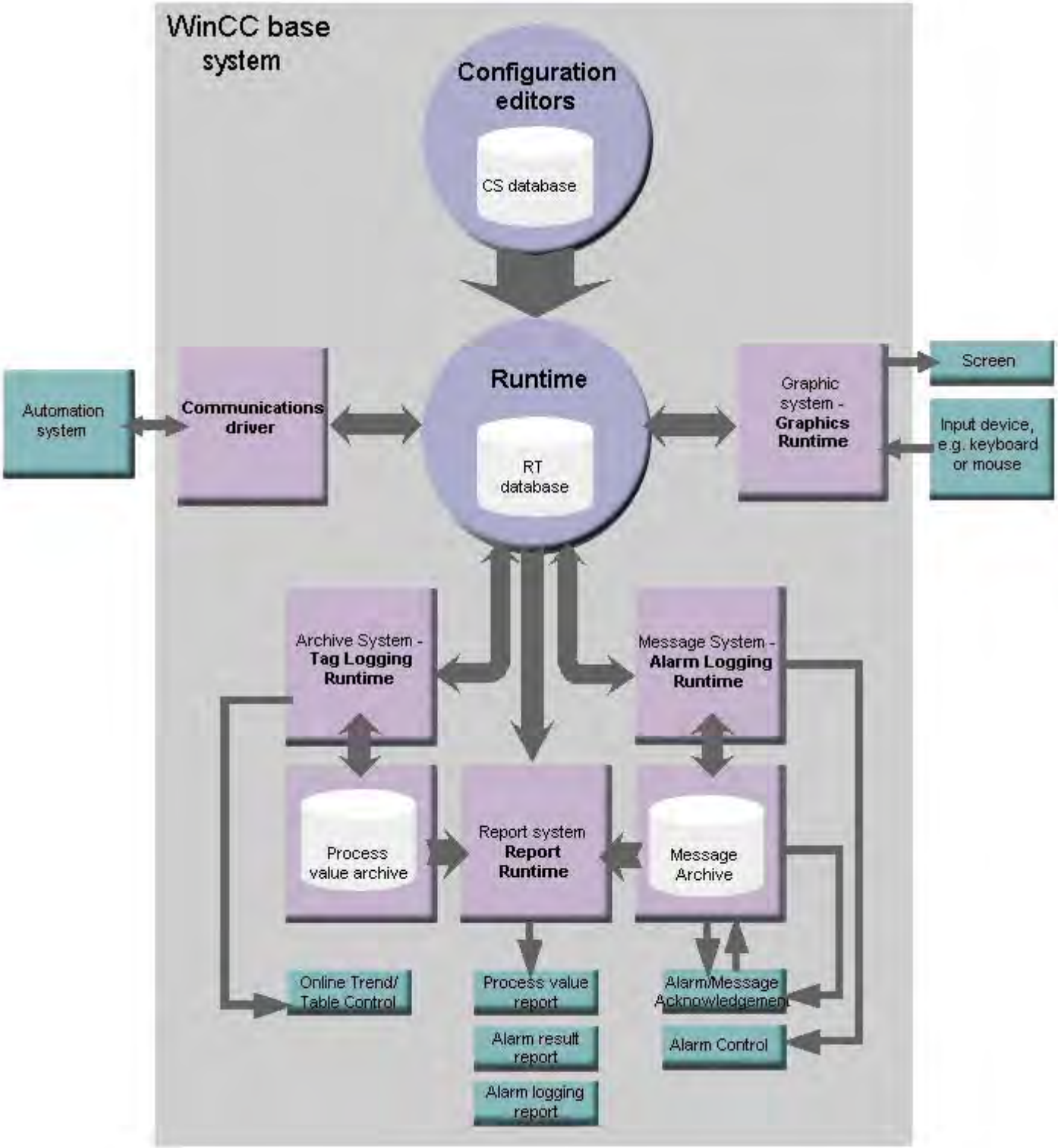
WinCC Function Chart (Page 65)

2.4.7 WinCC Function Chart

Overview

The following graph summarizes the interaction between the WinCC subsystems. This provides important information relating to the sequence that is employed for configuration.

For example, the Report Designer provides the print jobs for the output of reports and logs. Data cannot be printed until you configure the corresponding layout in Report Designer.


WinCC base system
Configuration editors
CS database
Runtime
RT database
Automation system
Communications driver
Graphic system - Graphics Runtime
Screen
Input device, e.g. keyboard or mouse
Archive System - Tag Logging Runtime
Message System - Alarm Logging Runtime
Process value archive
Report system Report Runtime
Message Archive
Online Trend/ Table Control
Process value report
Alarm result report
Alarm logging report
Alarm/Message Acknowledgement
Alarm Control

Workflow

You will use the editors in the Configuration software to create your project. All WinCC editors store their project information in the Configuration database (CS database).

In runtime, the project information is read out of the Configuration database by the Runtime software and the project is executed. Current process data is temporarily stored in the Runtime database (RT database)

- The Graphics System displays pictures on the screen. Conversely, it also accepts operator input, such as when the operator clicks on a button or enters a value.
- Communication between WinCC and the automation systems is effected by means of communication drivers, or channels. The channels have the task of collecting the process value requirements of all runtime components, reading the values of the process tags out of the automation systems and, if necessary, writing new values into the automation systems.
- The exchange of data between WinCC and other applications might be performed by means of OPC and OLE.
- The Archiving System saves the process values in the process value archive. The archived process values are, for example, needed to display the temporal development of these values in Online Trend Control or in Online Table Control.
- The individual process values are monitored by Alarm Logging. If a limit value is exceeded, Alarm Logging will generate a message which will be issued in Alarm Control. The message system also receives the acknowledgements made by the operator and manages the message states. Alarm Logging saves all messages in the message archive.
- The process will be documented by the Report System on request or at predefined times. The Process value archive and the message archive are accessed for this purpose.

You will find more information about WinCC editors and communication in the WinCC Information System.

See also

Communication (Page 62)

Report System (Page 60)

Archiving System (Page 57)

Alarm Logging (Page 54)

Graphics System (Page 51)

2.5 Configuring with WinCC

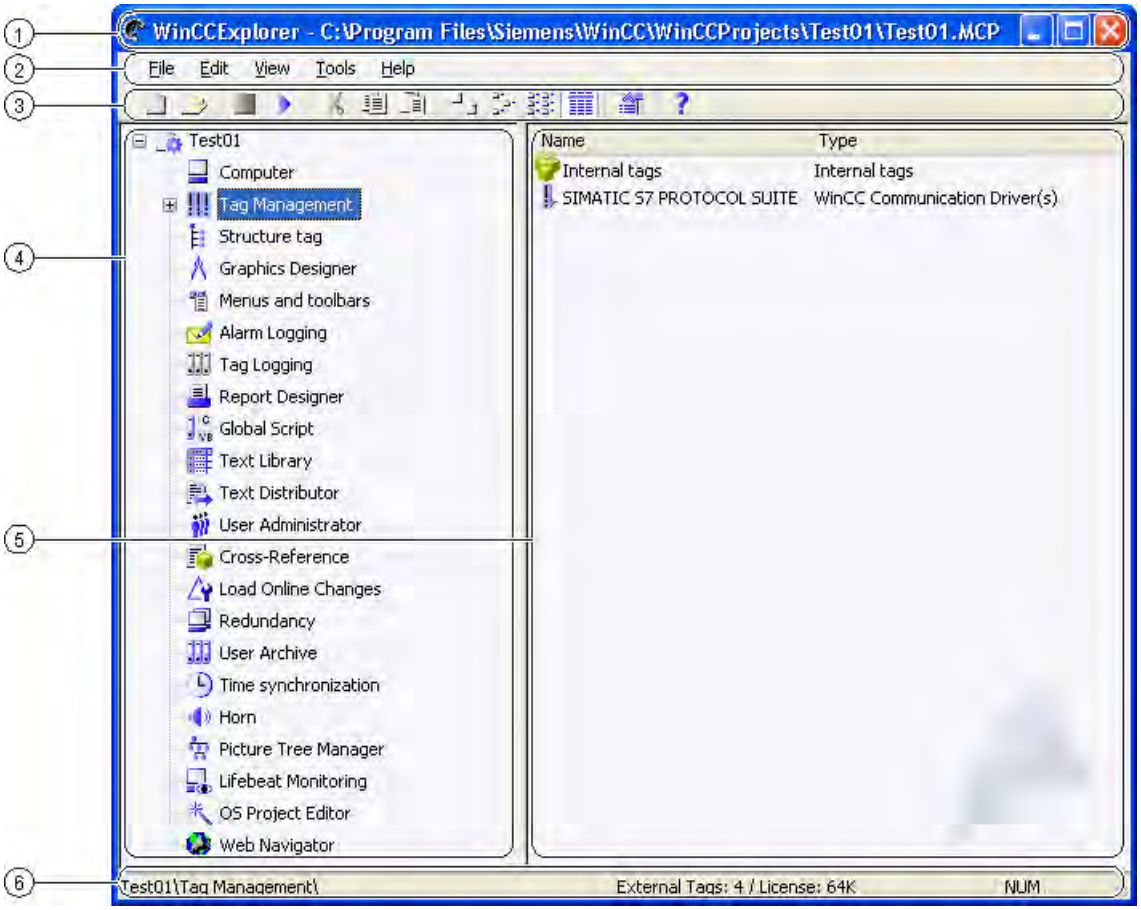
2.5.1 Configuring with WinCC

Configuration

WinCC facilitates the creation of complex projects without having to use a programming language. Working with WinCC has a visual focus – similar to when working with a drawing program. Assistants (Wizards) guide you through complex tasks. Precompiled function and graphics libraries simplify routine work.

WinCC Explorer

When you open WinCC, WinCC Explorer will immediately appear. This can be seen as a central tool for project administration.



① Title bar
② Menu bar
③ Toolbar
④ Navigation window

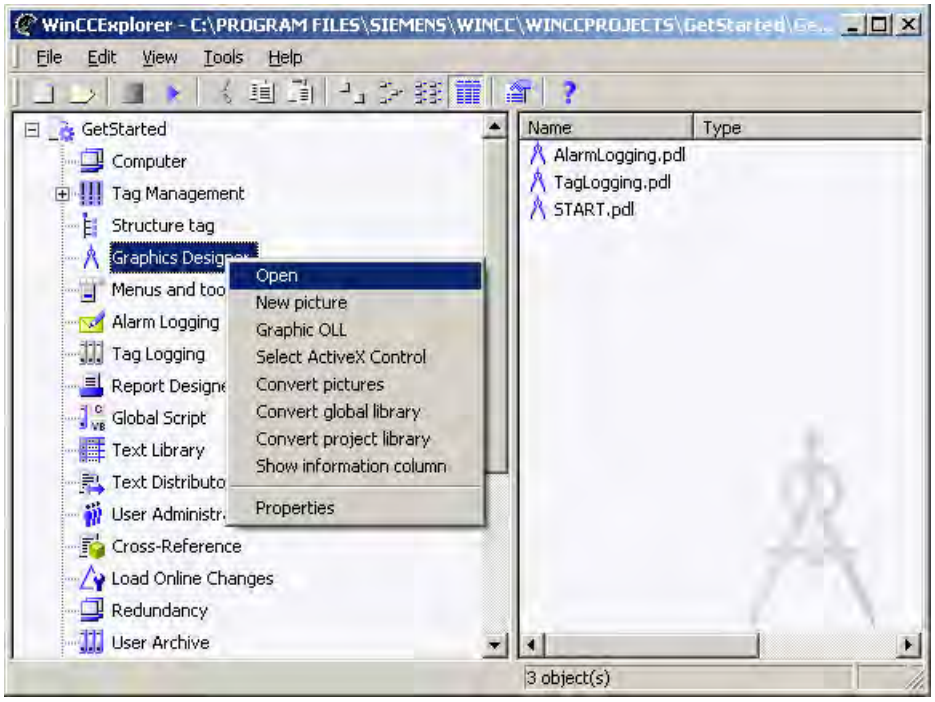
⑤ Data Window
⑥ Status bar

WinCC Explorer consists of three areas:

- All available commands can be accessed via the menu. The commands that are used most frequently are available as symbols in the toolbar.
- All the components of WinCC can be found in the project navigation window.
- The content of the data window will vary depending on the component that has been selected in the project navigation window. The data window shows which objects or definitions belong to this component. In the case of the Graphics Designer this will, for example, be the screens of your project.

Pop-up Menus

In WinCC, a pop-up menu has been provided for each component in the project navigation window and for each object in the data window. If, for example, you wish to open the pop-up menu for the Graphics Designer, click (with the right mouse button) on the component which bears this name in the project navigation window.



Each pop-up menu contains a list of all the commands that are most frequently used in conjunction with the selected component or the selected object.

See also

Creating and Archiving Messages (Page 86)
Guide Through Your Projects (Page 98)
Running and Testing Projects (Page 96)
Setting Up Multilingual Projects (Page 94)
Preventing Unauthorized Operation (Page 91)
Documenting Processes and Events (Page 89)
Visualizing Process Value Developments (Page 84)
Archiving Process Values (Page 81)
Showing Current Process Values (Page 80)
Accessing Process Values (Page 78)
Reacting on Input (Page 76)
Visualizing Processes (Page 73)
Setting Up and Administering Projects (Page 70)

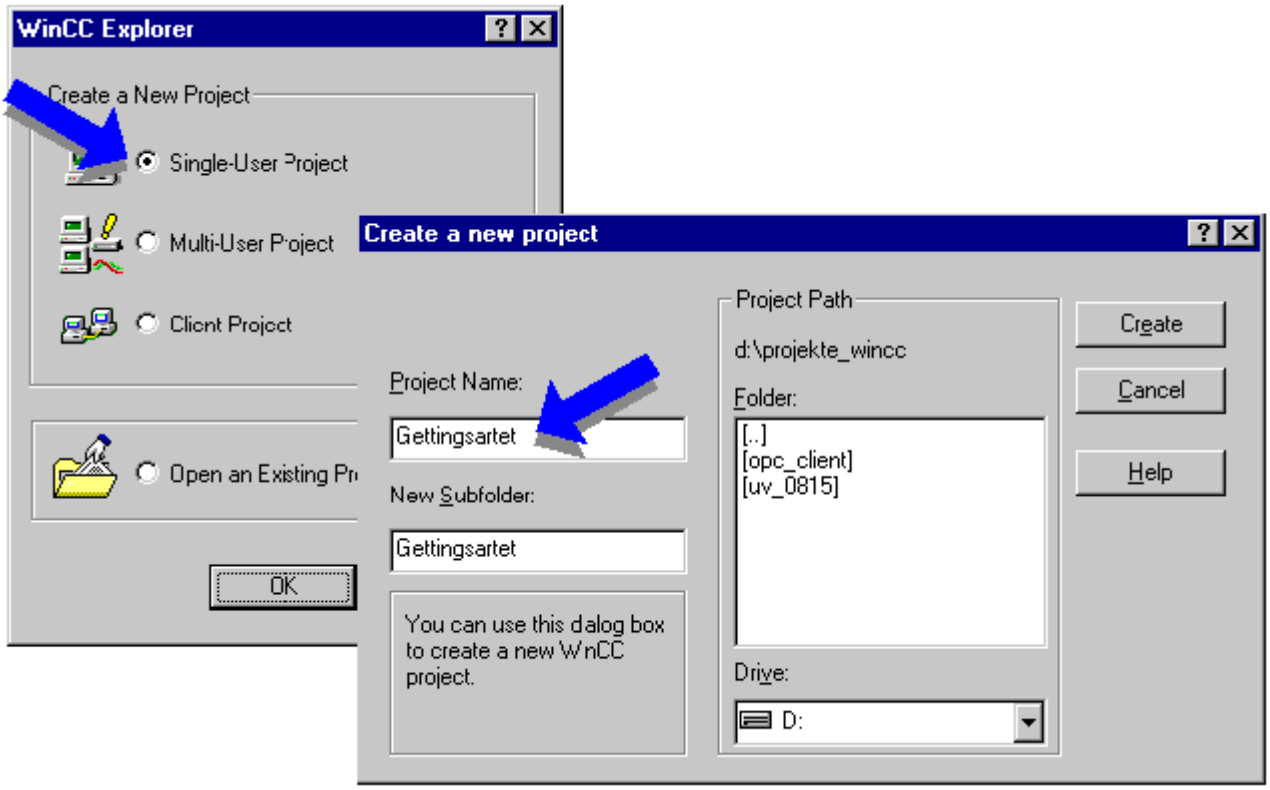
2.5.2 Setting Up and Administering Projects

Overview

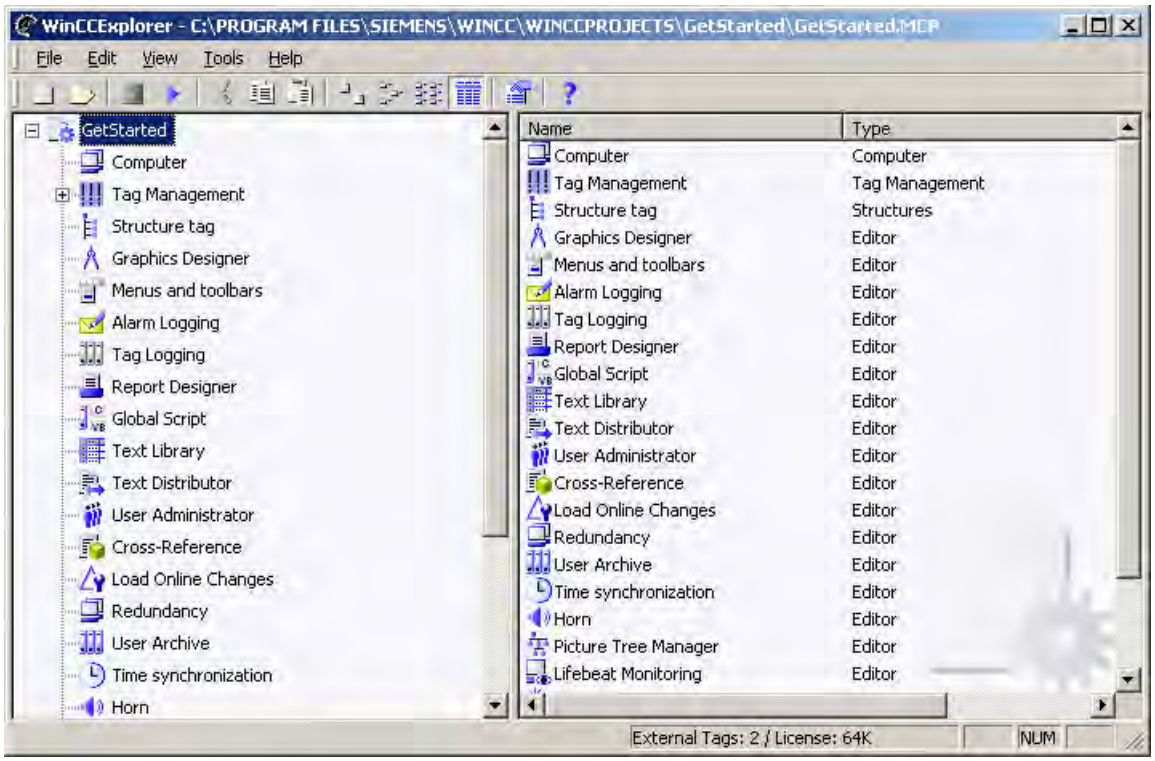
In WinCC Explorer you will be able to set up and administer projects. The Project Assistant will guide you through the setting up phase.

Configuring with the Project Assistant

The Project Assistant will open automatically when you select the menu item "File > New". The Assistant asks you for the project type (single-user or multi-user project), the name of the project and where it is stored.



As soon as the Assistant has set up the project, the basic data of the project that has been created by the Project Assistant will appear in WinCC Explorer. The project name will appear in the title bar of WinCC Explorer.



Configuring with WinCC Explorer

You can also use WinCC Explorer to administer your projects.

- The individual operator consoles are configured using the component "Computer". Here, you also define which runtime components should be started when the project is enabled.
- The connection to the connected automation systems is established under the component "Tag Management". The tags that are required for data exchange with the automation systems are also defined here.
- The remaining components have specialized editors for all further configuration tasks. These editors can be selected from the pop-up menu.

See also

Guide Through Your Projects (Page 98)

WinCC Function Chart (Page 65)

Licensing (Page 36)

2.5.3 Visualizing Processes

Overview

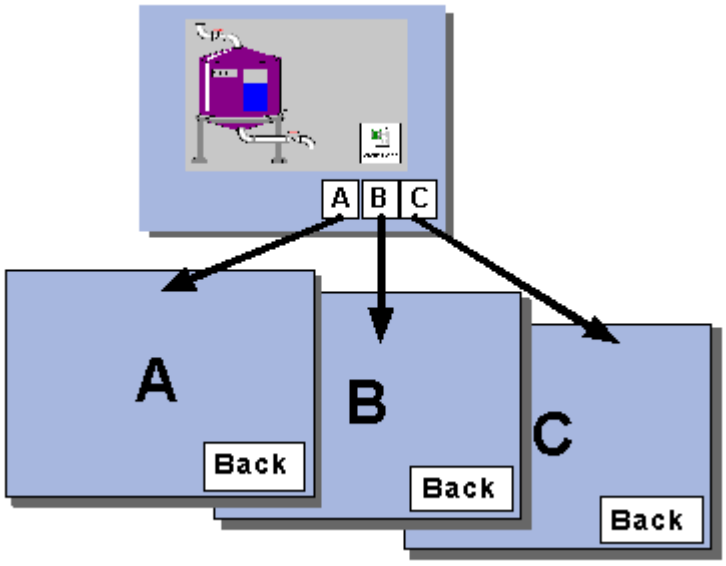
The screens serve to visualize the process that is to be controlled and observed. They display the important process steps or plant parts and present the production process in a schematic manner.

Each screen is made up of several screen elements:

- Statistical screen elements remain unchanged in runtime.
- Dynamic screen elements will change in accordance with the individual process values. A bar is an example of a dynamic screen element. The length of the bar will depend on the current temperature value. Another example would be a pointer instrument with a moving pointer.
- Controllable screen elements allow the operator to have an active influence on the process. These could be buttons, sliders or text boxes for entering certain process parameters.

In the vast majority of cases, a project comprises several screens. Each screen shows a different process step or displays special process data.

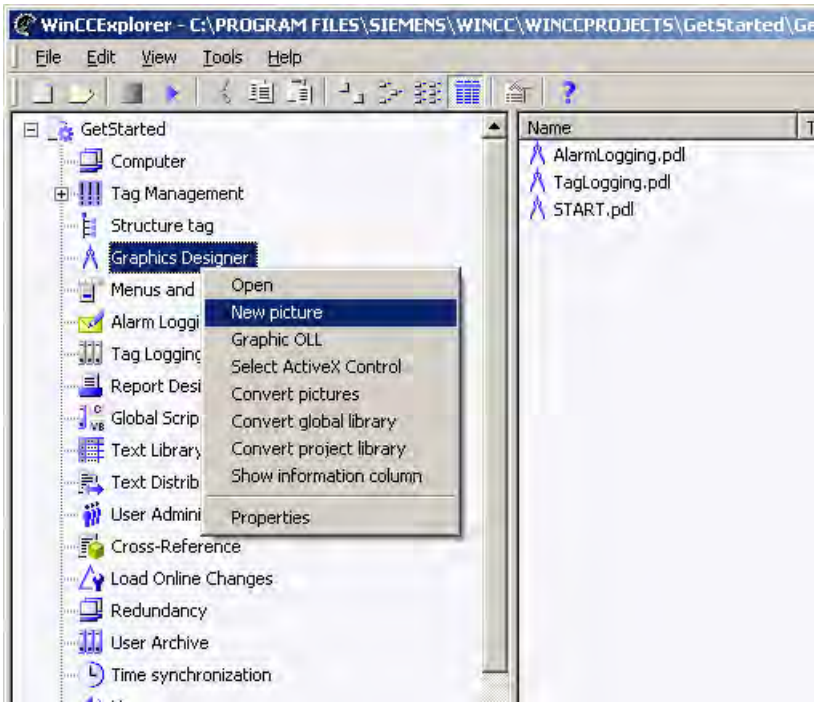
To allow the operator to switch between the various screens as required by the situation on hand, it is essential that corresponding operator-controllable buttons be inserted in each screen. Here, buttons should be used that select another screen when they are clicked on.



Alternatively, new screens which are still empty can also be created using the Graphics Designer or WinCC Explorer. If you wish to process each screen immediately, you will find that creating screens using the Graphics Designer is much faster. If, however, you wish to create all required screens before you process them, we recommend that you use WinCC Explorer.

Configuring with WinCC Explorer

Click with the right mouse button on the entry "Graphics Designer" in WinCC Explorer to open the pop-up menu. A new and empty screen can be inserted into the data window by clicking "New picture".



The subsequent processing steps can also be accessed via the pop-up menu. To access these steps, simply click the newly created screen with the right mouse button. The most important menu items are "Rename" and "Open":

- The menu item "Rename" can be used to assign the screen a more meaningful name.

  Note

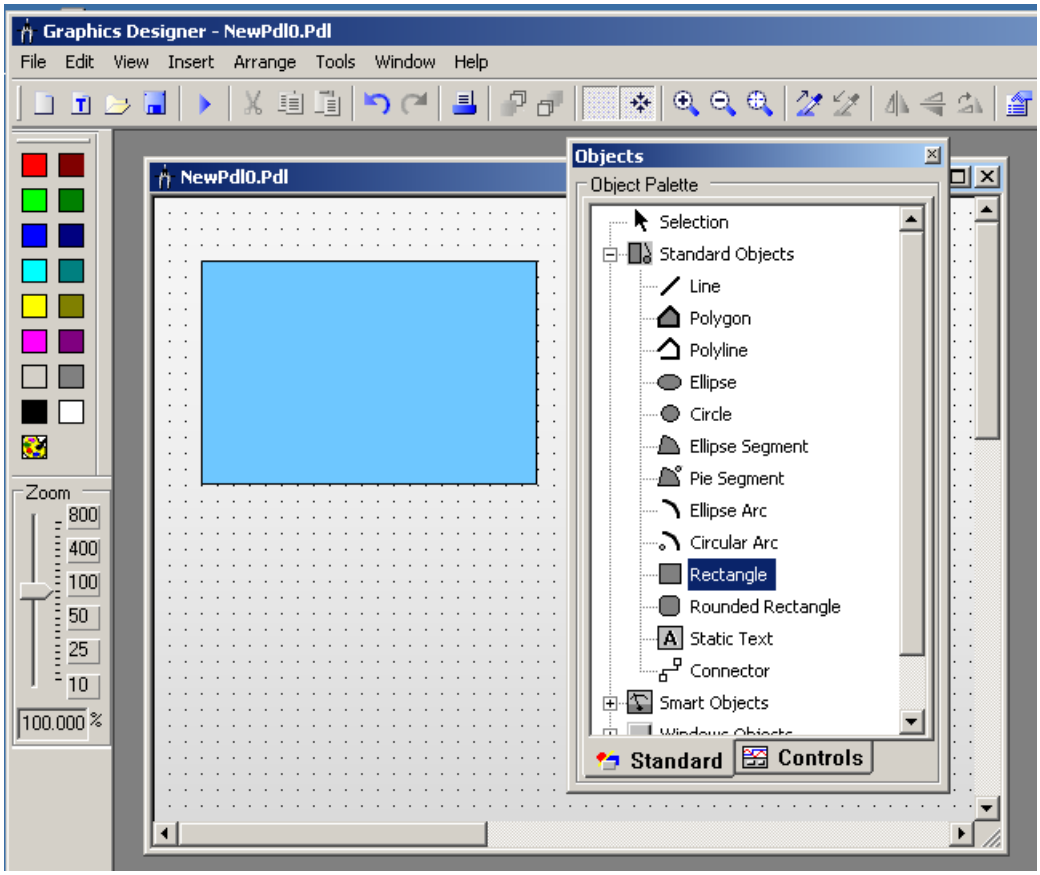
  If you rename a screen in WinCC Explorer, only use a picture name one time. The software does not check whether the name already exists. Duplicate pictures names can lead to conflicts during access via VBA or during dynamization.

- The menu item "Open" is used to open the screen for processing in the Graphics Designer.

Configuring with the Graphics Designer

The structure of the Graphics Designer is similar to a drawing program and it is also operated in a similar manner. Any required element can be dragged onto your screen using the mouse.

You then position the elements and modify the size, color and other presentation options if necessary.



Aids

Aside from the standard objects such as rulers, rectangles or circles, WinCC also has an extensive library of graphical objects, e.g. cables, tanks or motors.

Alternatively, you can import graphs from other external graphics programs.

See also

Guide Through Your Projects (Page 98)

Graphics System (Page 51)

WinCC Function Chart (Page 65)

2.5.4 Reacting on Input

Overview

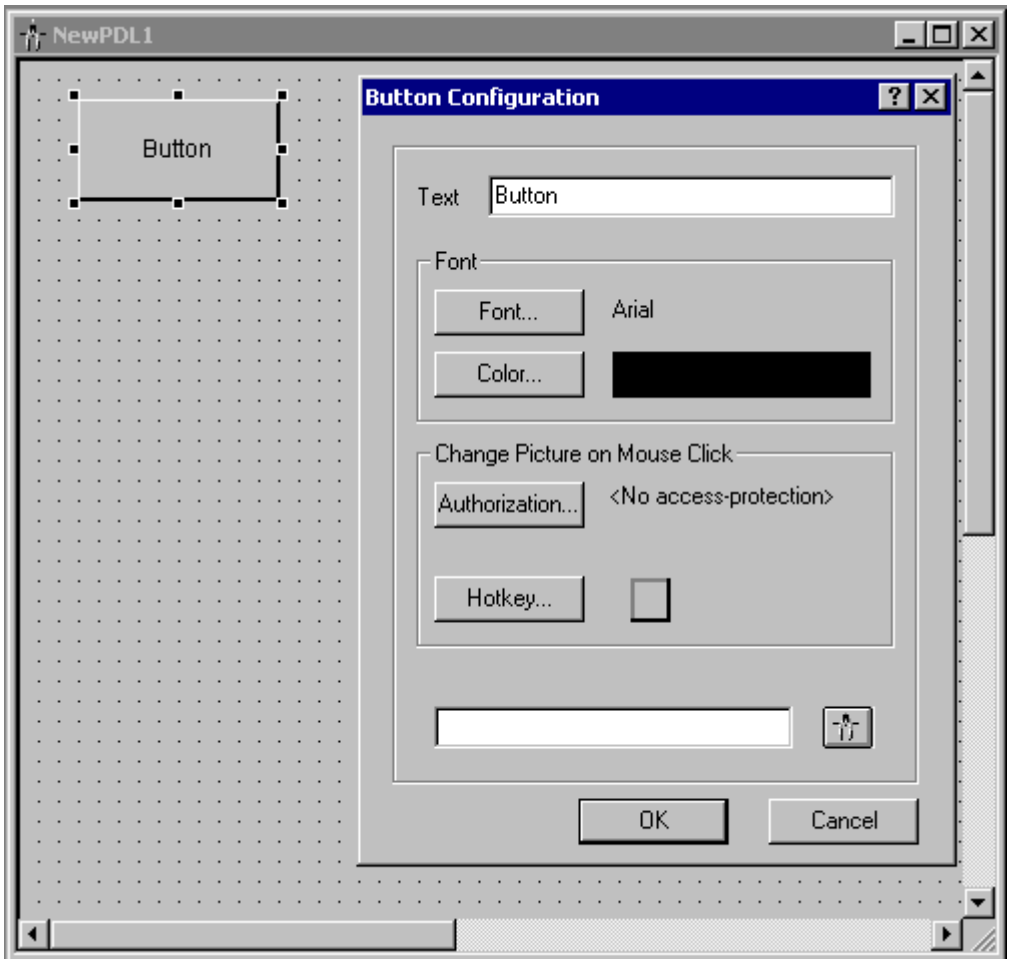
It is essential that operator-controllable screen elements be inserted in your screens to allow the operator to control the process in runtime.

In order to make operation as intuitive and simple as possible, WinCC has ready-made, standard Windows elements: buttons, check boxes, sliders, I/O fields and more.

Configuring with the Graphics Designer

Operator-controllable screen elements are inserted into your screen in the same manner as the normal screen elements using the Graphics Designer.

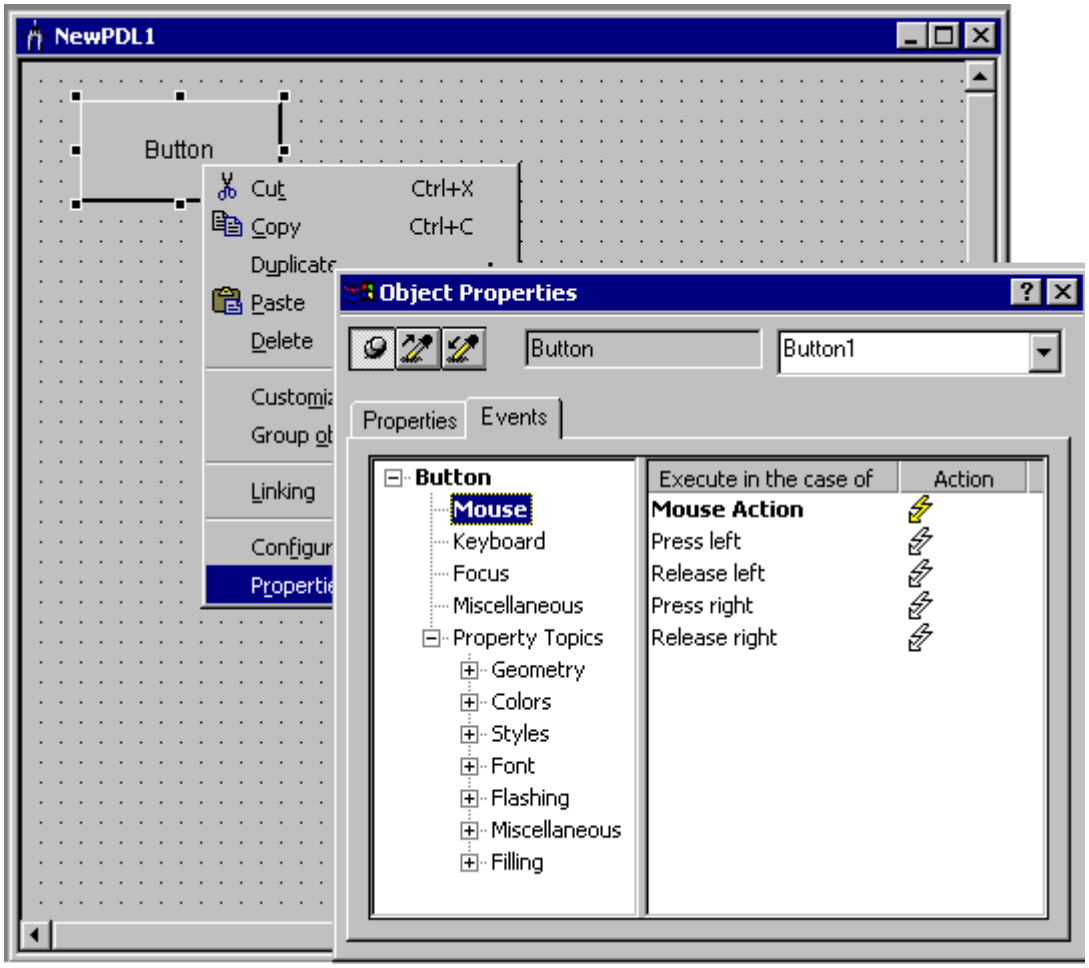
Once the elements have been added, a configuration dialog will open automatically. This contains the most important parameters relating to the presentation and behavior of the inserted element.



Linking special events with actions

In addition to the configuration dialog, another dialog which contains a complete list of all object properties is available with each element.

The dialog Object Properties can be accessed via the pop-up menu.



The dialog Object Properties allows you to link actions with screen elements. Actions are triggered by events in runtime. In the case of a button, for example, the mouse click represents the event. When the specified event takes place, an action, e.g. a screen change, will be executed.

See also

Graphics System (Page 51)

Visualizing Processes (Page 73)

Guide Through Your Projects (Page 98)

WinCC Function Chart (Page 65)

2.5.5 Accessing Process Values

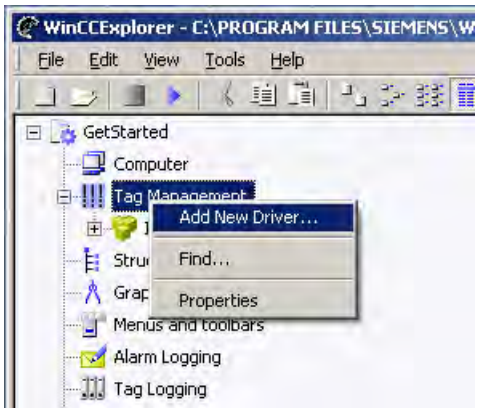
Overview

A connection between WinCC and the automation system will have to be configured before you can access the current process values of the automation system.

Configuring with WinCC Explorer

As setting up a connection is one of the central tasks for the entire project, WinCC Explorer will have to be used here.

The first step involves selecting a channel. To do this, select the menu item "Add New Driver" in the pop-up menu of the component "Tag Management".

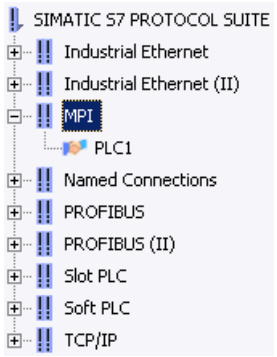


You will now be able to select the required channel in a selection box.

A lot of channels support several communication protocols. The supported protocols are listed below the channels in WinCC Explorer. In the following example, the channel SIMATIC S7 PROTOCOL SUITE (the channel for the automation system SIMATIC S7) and the communication protocol MPI were selected. The channel/communication protocol combination determines the channel unit that will be used by WinCC.

Enter the connection to the automation system below the channel unit.

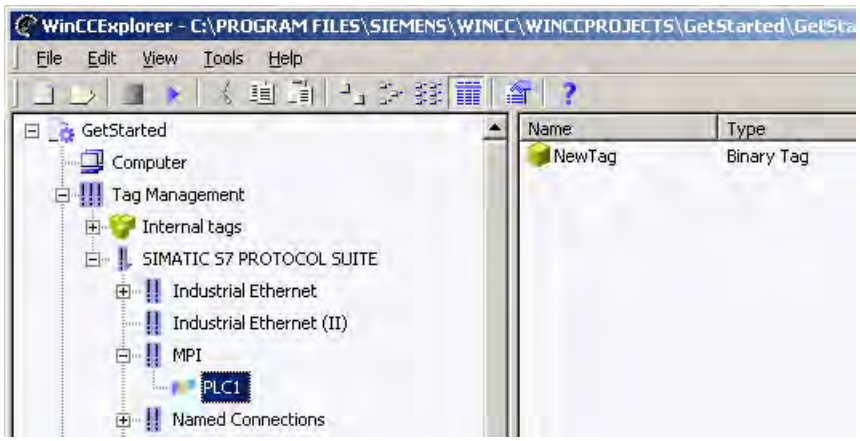
The connected automation system will then appear in WinCC Explorer as a channel unit entry.



Creating Process Tags

Process tags can be created in WinCC so that you do not have to work with numerical addresses in the memory area of the automation system. Each process tag has a unique name under which it can be addressed throughout the entire system.

The process tags are also created in WinCC Explorer. As each process tag is linked exclusively to a specific automation system, each of the process tags in WinCC Explorer appears as an object of this automation system.



Simplification with SIMATIC S7

Configuration is particularly easy if you use a SIMATIC S7 automation system. Here, you will not have to create the process tags manually in WinCC as you will have direct access to the symbol table in STEP 7.

Using Process Tags

Screen elements can be used to show the value of a process tag. You can, for example, display the value in numerical form or in the form of a bar which varies in length depending on the value. By using suitable screen elements, you can also allow the operator to determine the value of the tag himself, i.e. to write the tag. You could, for example, provide an I/O field in which the operator can enter a setpoint.

See also

Guide Through Your Projects (Page 98)

Showing Current Process Values (Page 80)

WinCC Function Chart (Page 65)

Communication (Page 62)

2.5.6 Showing Current Process Values

Overview

All dynamizable screen elements can, in principle, be used to visualize process values. If, for example, you wish to display the current temperature, you can opt for one of several possibilities:

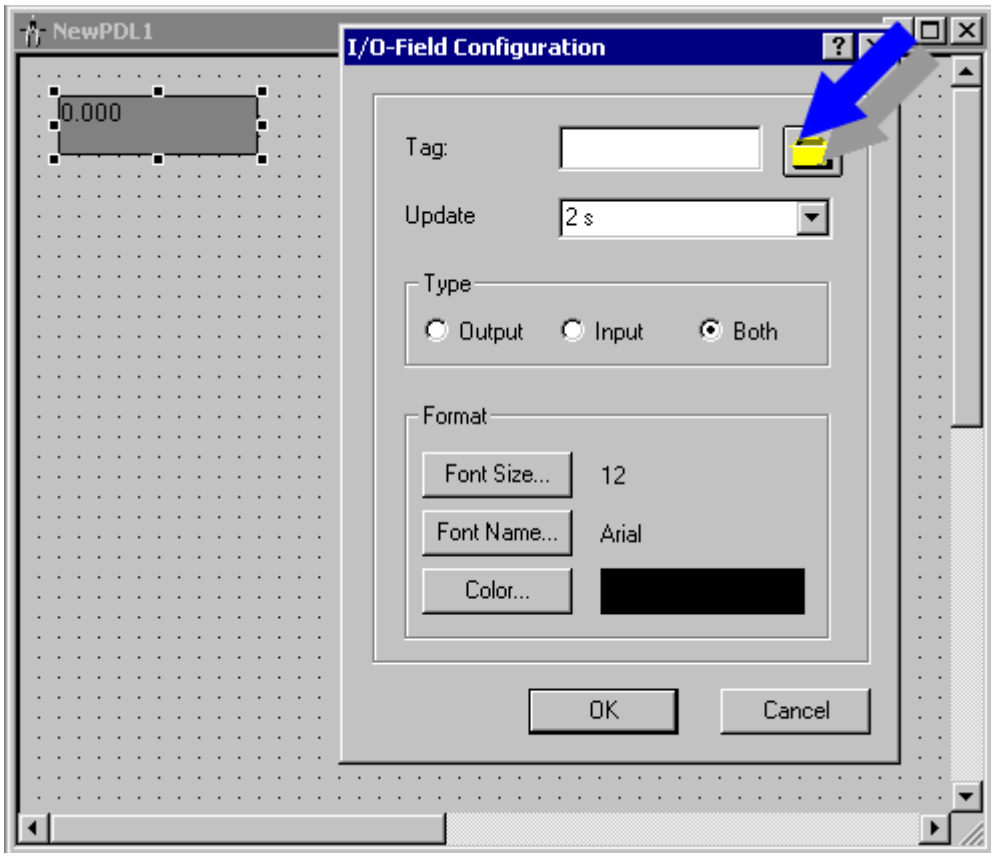
- If an I/O field with a numerical value is used, the temperature can be output in digital form.
- You could also draw a simple thermometer and alter the length of a bar object depending on the temperature value.
- Alternatively, you could use a precompiled OCX Control which, for example, represents a pointer instrument.

Configuring with the Graphics Designer

The following applies irrespective of the type of the selected graphic element: The display is updated automatically as soon as the process value in the automation system changes.

To achieve this, it will be necessary to link the object property which will change dynamically (e.g. the value displayed in the I/O field) to the process tags which contain the current process value (the temperature in the above example).

This link is established in the Graphics Designer using the configuration dialog of the dynamic screen element.



The connected tag determines the displayed value. The update is effected in accordance with the time interval after which the displayed value is compared to the current value and, if necessary, updated. In the above example, updating is effected two times a second (time interval = 500 ms).

See also

Guide Through Your Projects (Page 98)

Visualizing Process Value Developments (Page 84)

Accessing Process Values (Page 78)

WinCC Function Chart (Page 65)

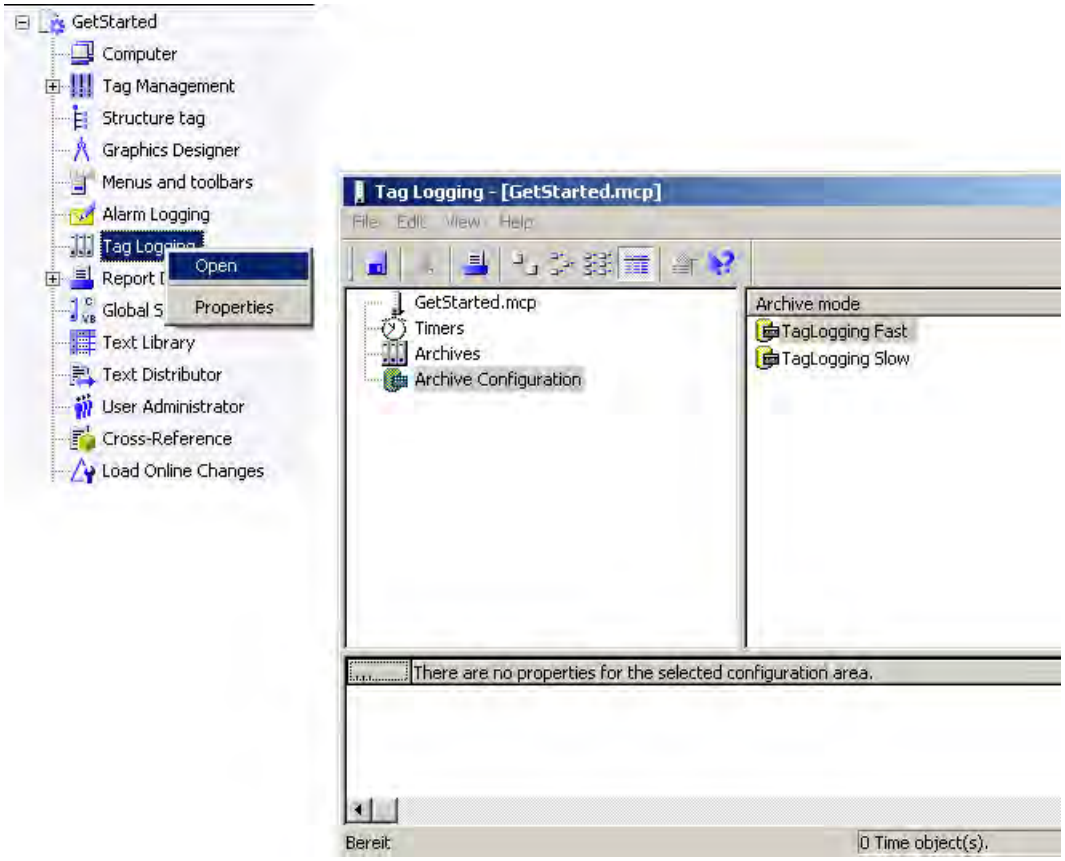
2.5.7 Archiving Process Values

Overview

WinCC allows you to save the process values in the process value archive. The archive can, for example, be used at a later point in time to display and evaluate the temporal development of the process values.

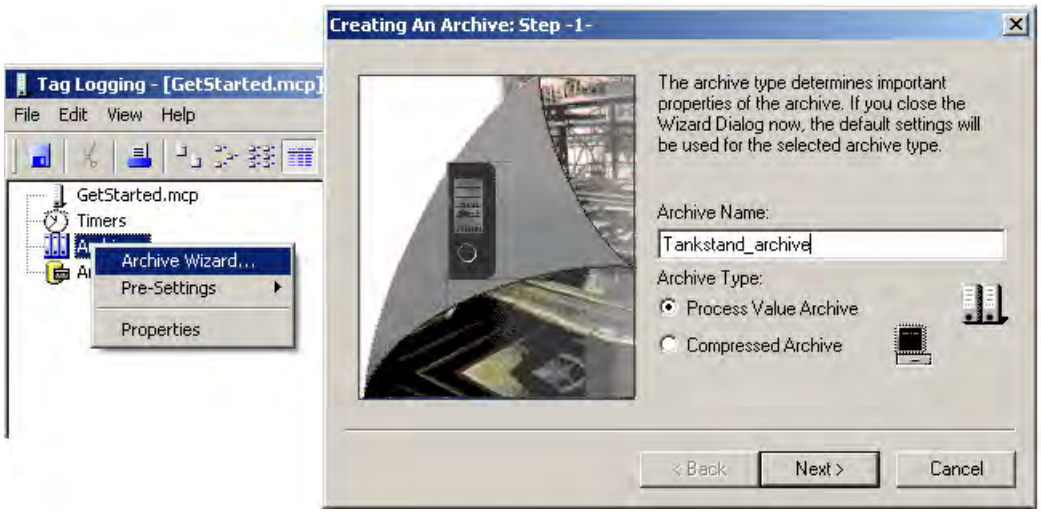
Configuring with Tag Logging

Tag Logging is used to create and administer process value archives. Tag Logging is started via the pop-up menu in WinCC Explorer. As with WinCC Explorer, Tag Logging also has its own navigation and data window.



Archive Wizard

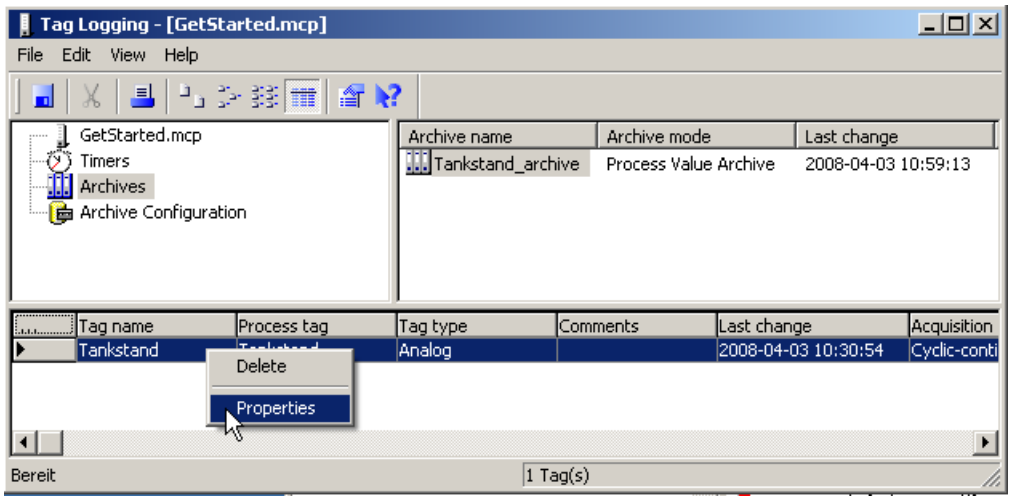
The Archive Wizard will provide you with valuable assistance when creating the process value archive. The Archive Wizard can be accessed via the pop-up menu for the entry Archive in the Tag Logging navigation window.



The Archive Wizard will guide you through the required steps.

Once it has been created successfully, the process value archive will appear in the Tag Logging data window. The list of process tags which are to be archived in this archive will appear at the bottom of the pane.

The pop-up menu can be used to make additional settings, e.g. the time interval at which the values should be saved in the process value archive.



See also

Guide Through Your Projects (Page 98)
Accessing Process Values (Page 78)
WinCC Function Chart (Page 65)
Archiving System (Page 57)

2.5.8 Visualizing Process Value Developments

Overview

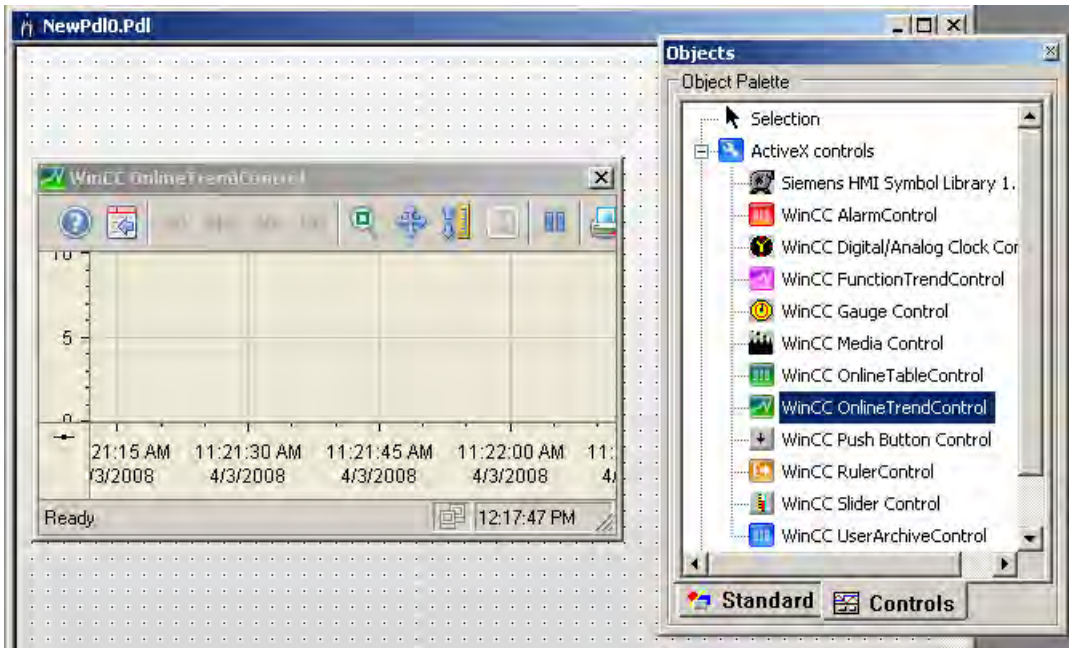
WinCC allows you to visualize the temporal development of process values. Here, it will be necessary to access historic process values. Process values which are used to show development must therefore be saved in a process value archive.

Configuring with the Graphics Designer

Three picture elements have been provided in WinCC specially for the purpose of accessing the process value archive and displaying data in tabular and in graphical form:

- the WinCC Online Trend Control for graphical display
- the WinCC Function Trend Control for the graphical processing of tags. The Trend Control function gives you the option of displaying the values of tags as the function of another tag
- the WinCC Online Table Control for tabular display

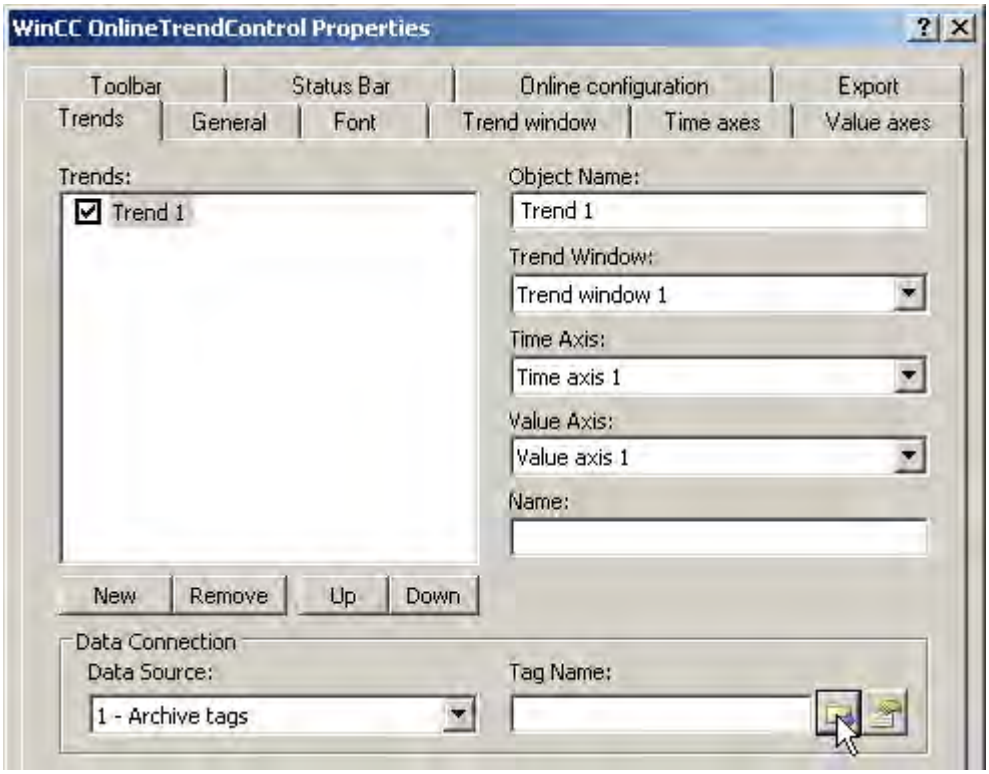
The required control can be dragged with the mouse from the object palette in the Graphics Designer and inserted into one of your screens. The controls can be found in the object palette of the Graphics Designer on the "Controls" tab.



Connecting with the Archive

Once you have dragged the control into your screen, the configuration dialog of this control will automatically appear. Enter the process tags that are to be displayed by the control. Select

entry "1 - Archive tags" as the "Data source" and the archive that contains the recorded process values of the process tags under "Tag name".



When in runtime, the development of the archived process data will appear in the control.

See also

Guide Through Your Projects (Page 98)

Archiving Process Values (Page 81)

Showing Current Process Values (Page 80)

WinCC Function Chart (Page 65)

Archiving System (Page 57)

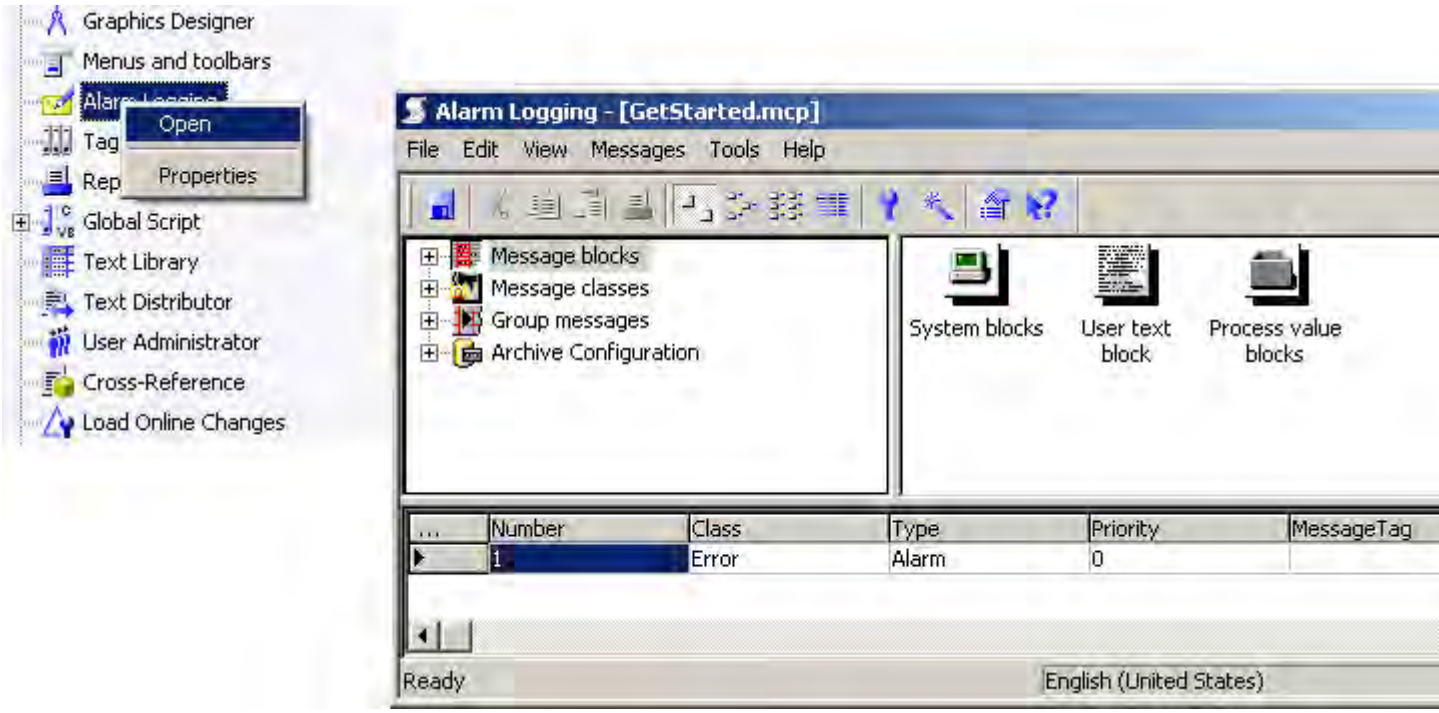
2.5.9 Creating and Archiving Messages

Overview

Messages serve to provide the operator with information relating to the operating status and the fault status of the process. The messages are shown in runtime in a special message view.

Configuring with Alarm Logging

Messages are configured in Alarm Logging. Alarm Logging can be accessed via the pop-up menu of the component of the same name in WinCC Explorer.



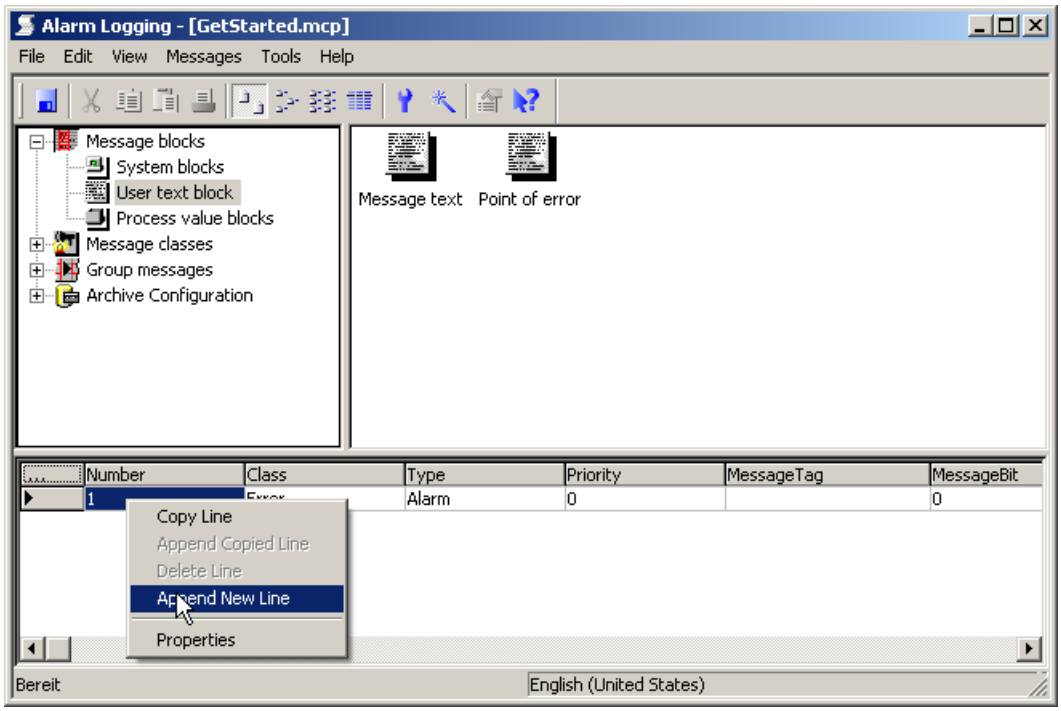
Creating a Message System

Before you create and configure individual messages it will be necessary to create the message system known as Alarm Logging. Among others, the following criteria will have to be defined here:

- which message blocks are to be included in your messages
- which message classes are to be set up

The System Wizard provides valuable assistance when setting up Alarm Logging. The System Wizard can be found in the toolbar in Alarm Logging.

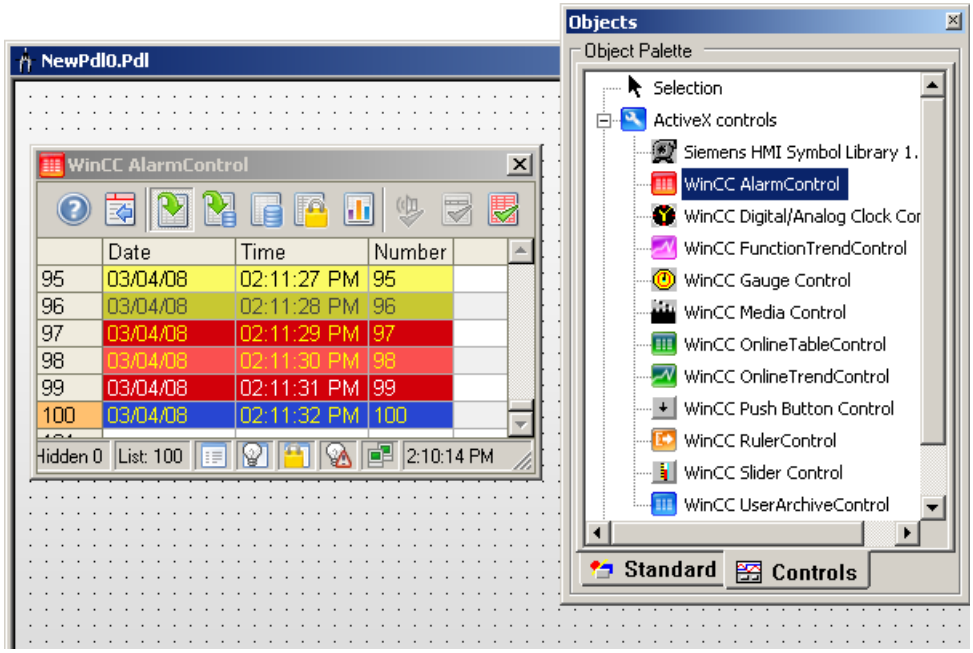
You will be able to create and configure individual messages once Alarm Logging has been set up by the Wizard.



Configuring with the Graphics Designer

WinCC includes a preconfigured message view for displaying messages: the WinCC Alarm Control.

The WinCC Alarm Control can be dragged with the mouse from the object palette in the Graphics Designer and inserted into one of your screens. The WinCC Alarm Control can be found in the object palette of the Graphics Designer on the Controls tab.



When in runtime, the Alarm Control will show the operator the messages in tabular form.

See also

Archiving System (Page 57)

Guide Through Your Projects (Page 98)

WinCC Function Chart (Page 65)

Alarm Logging (Page 54)

2.5.10 Documenting Processes and Events

Overview

There are various types of reports that can be used depending on the type of data that is to be documented e.g. process values or messages. When configuring, you perform the same steps for the most part for all report types.

Configuring with the Report Designer

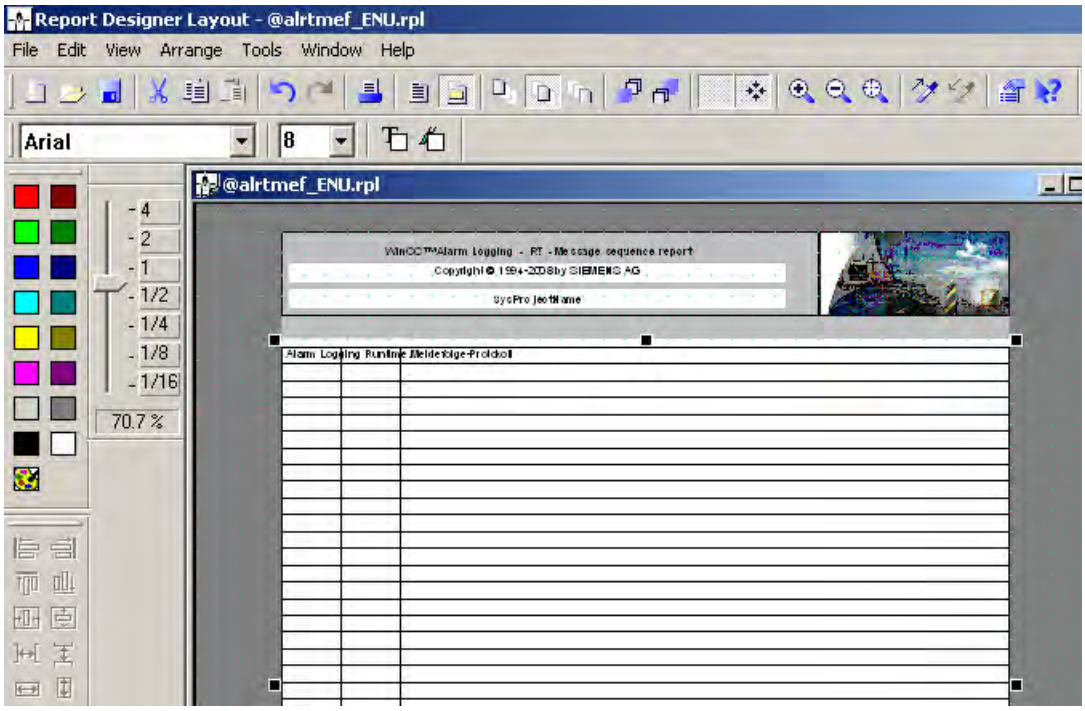
You create the layout for a report with Report Designer.

Preconfigured reports have already been provided for most application cases. While configuring, it will only be necessary to link these preconfigured reports to your own archives. This link to the archive is necessary as, in most cases, a report will also contain historic data which is no longer in the process tags at the time the report is printed.

The Report Designer can also be used to modify the preconfigured reports. This is usually much easier and quicker than creating a new report.

The preconfigured reports can be found in the WinCC Explorer navigation window below the entry "Report Designer". When you select the "Layouts" entry, the available layouts appear in the data window.

Select "Edit" on the pop-up menu to open a layout in Report Designer. Alternatively, you can open the Report Designer first and then open the layout by selecting the menu item "File".



Static and dynamic layout elements

Each page layout consists of static and dynamic objects:

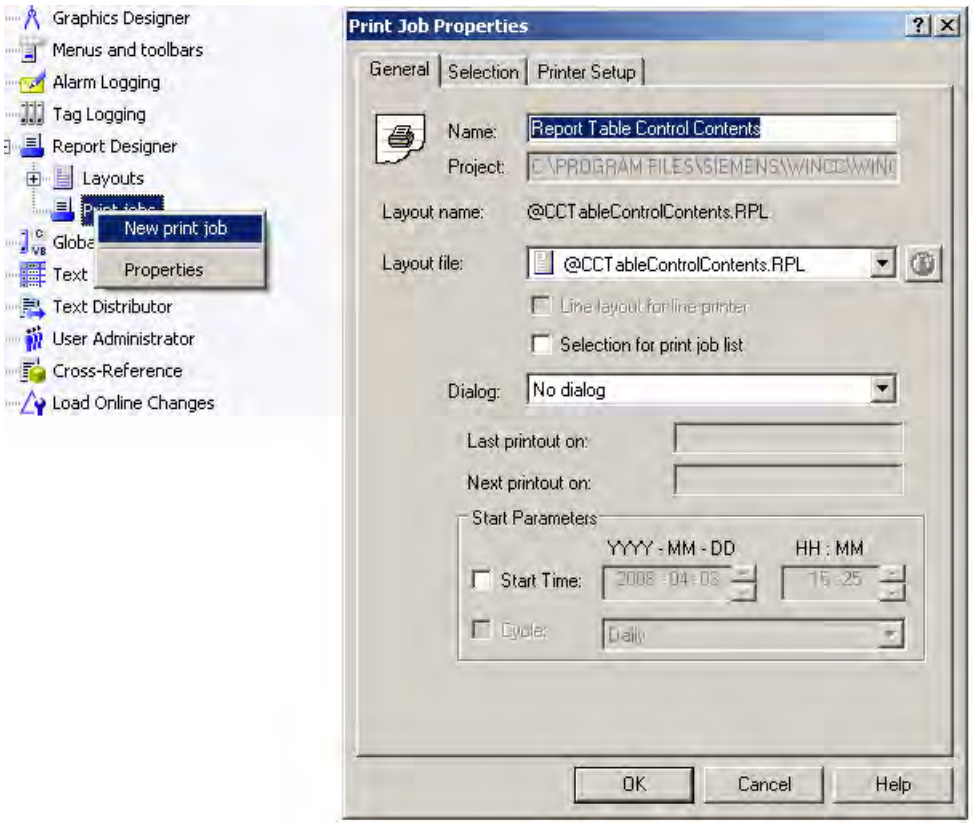
- Static layout elements appear on each page of the printout in the same form, e.g. a title line or your company logo.
- When in runtime, WinCC supplies the dynamic layout elements with up-to-date process data. When configuring in Report Designer you will only have to create placeholders for this data.

Configuring with WinCC Explorer

Print jobs specify the times at which your reports are printed.

Predefined print jobs – which only need to be adapted – have already been provided for those reports that are most frequently used.

Print jobs are edited in WinCC Explorer.



See also

Guide Through Your Projects (Page 98)

WinCC Function Chart (Page 65)

Report System (Page 60)

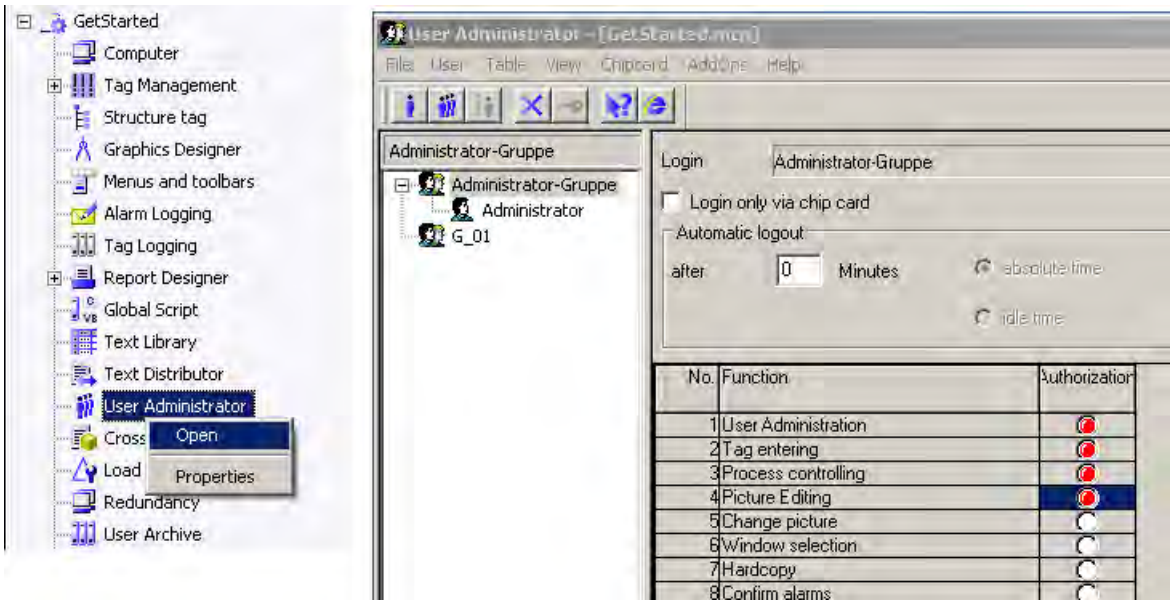
2.5.11 Preventing Unauthorized Operation

Overview

The improper operation of a machine or system can have grave consequences. Certain functions should therefore only be made available to the appropriate authorized operators.

Configuring with the User Administrator

The User Administrator is used to issue and control access authorization. The User Administrator is started via the pop-up menu in WinCC Explorer



Creating user and user groups

The first step involves the setting up of groups with their respective authorizations. Users are then set up and subsequently assigned to these groups.

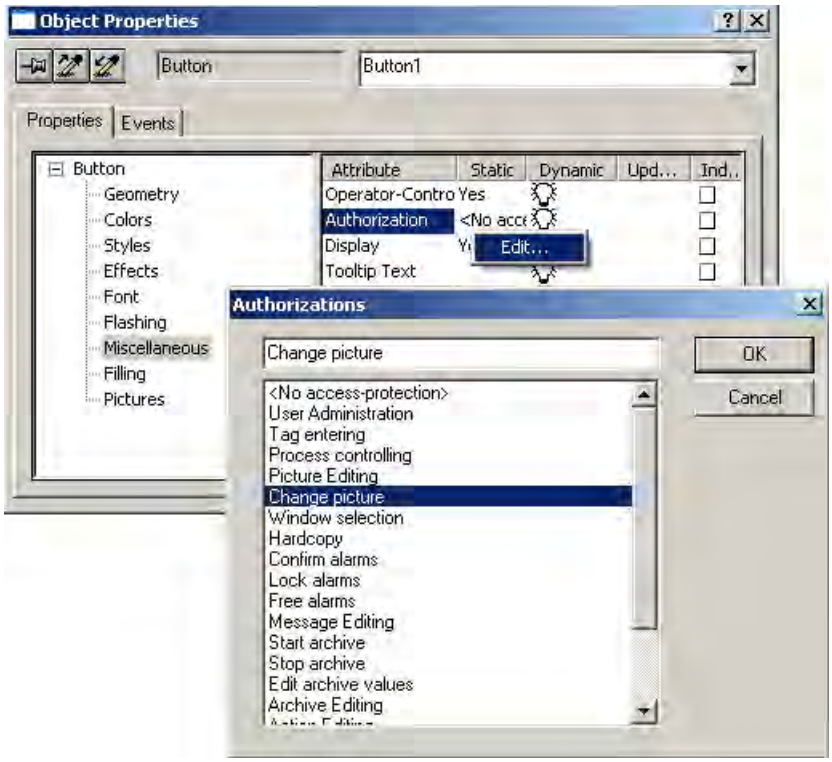
Issuing access authorization

A number of frequently used authorizations have already been predefined in the User Administrator data window. To assign a user or a user group a certain authorization, simply click the control box in the right hand column.

Configuring with the Graphics Designer

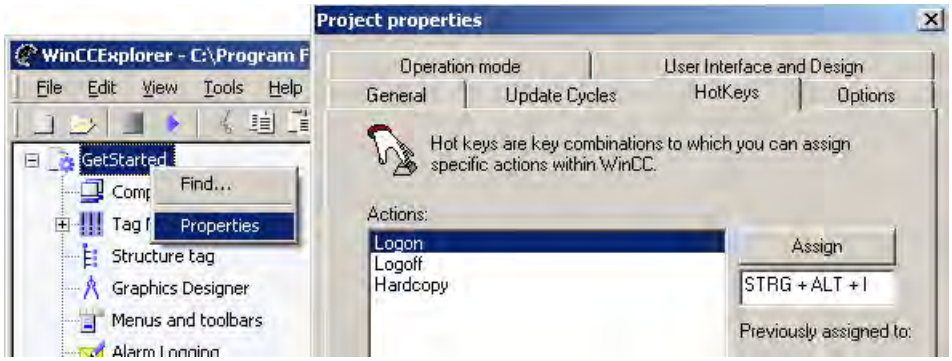
The settings that are made in User Administrator are not yet effective. To prevent unauthorized operation, you will have to go one step further and directly protect the appropriate screen element. Here, you specify in the Graphics Designer, the authorizations an operator must have to operate this screen element.

The authorizations form one of the object properties of the screen element.



Configuring with WinCC Explorer

You now have to define a shortcut which will call up the logon dialog. The operator will use this shortcut when logging onto the system. This setting can be accessed via the project properties in WinCC Explorer.



See also

Guide Through Your Projects (Page 98)

WinCC Function Chart (Page 65)

2.5.12 Setting Up Multilingual Projects

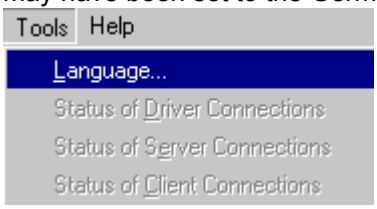
Overview

If you are exporting a system or operators of different nationalities operate the system, you will need WinCC's foreign language support.

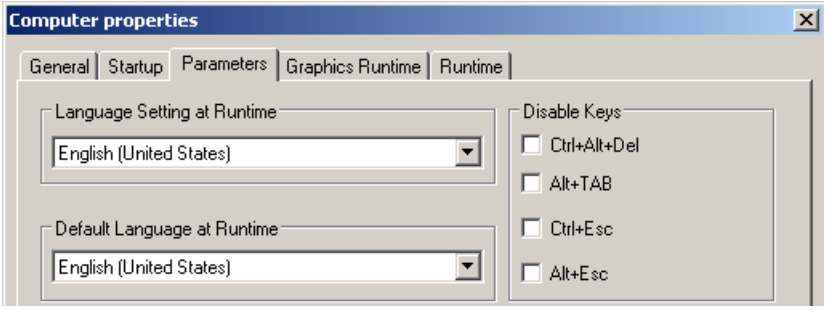
If you were to compile a copy of your original project in each foreign language for translation purposes, you would subsequently have to modify each version in the event of a change or changes being made. WinCC's foreign language support facilitates the maintenance of all languages in your original project.

WinCC has two language levels:

- The user interface language is the language of the WinCC Configuration software, i.e. the language that will be displayed during the configuration of the WinCC menus, dialogs and help texts. If required, the user interface language can be changed using the menu item Extras. The user interface language will not affect your project data in any way. A project could, for example, be created in the Russian language although the WinCC user interface may have been set to the German language.



- The runtime language is the language that will later be seen by your plant operator in runtime. The runtime language can be specified in the dialog Computer properties in WinCC Explorer.



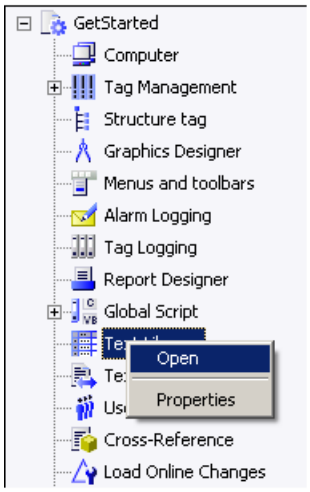
- You could also add an operator-controllable screen element to your project (e.g. a button or a selection list) which the operator can use to switch languages in runtime.

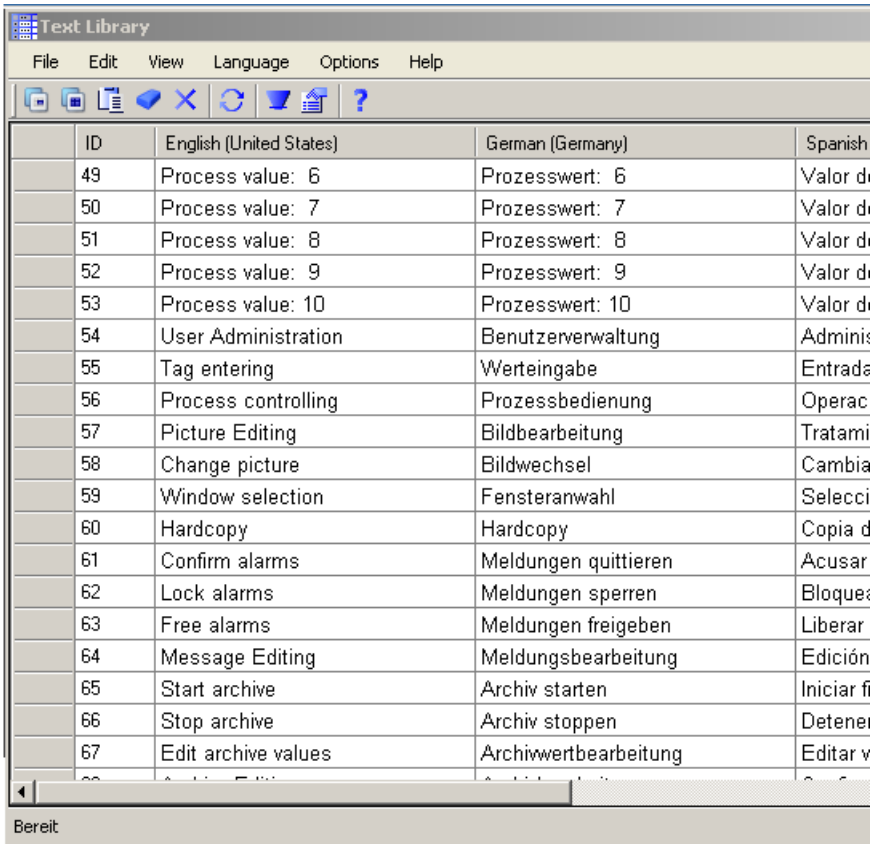
Configuring with the Text Library

To guarantee that your texts are displayed in the required language in runtime, it will first be necessary to save the translations in your project.

WinCC comes with a Text Library which simplifies the translation and maintenance of multilingual text elements (e.g. messages). Language-dependent text can be collected in the Text Library and subsequently translated in tabular form. If the translation work is to be outsourced to a translator that does not use WinCC, the tables can be exported into alternative programs.

The Text Library can be opened in WinCC Explorer.





Configuring with the Graphics Designer

Texts in screens and in screen elements (e.g. static texts or button labels) are not translated in the text Library but directly in the respective screen. The size of the screen element may have to be adapted. Each element must provide enough space for the language with the longest terms.

While configuring, you can switch to another language by clicking the menu item View > language in the Graphics Editor.

Exporting to other applications

You can export text for external translations, translate it external to WinCC and then re-import it. In the text library you can export the text to a csv file using the File menu and re-import it.

If you are managing very large quantities of text in the text library, you can alternatively use a bulk data tool such as the WinCC SmartTool Excel Configuration Tool for importing and exporting text.

See also

Guide Through Your Projects (Page 98)

WinCC Function Chart (Page 65)

2.5.13 Running and Testing Projects

Overview

You will require the WinCC Runtime software to run your projects. If the Runtime software was installed together with the Configuration software you will not have to move to another workstation to carry out tests.

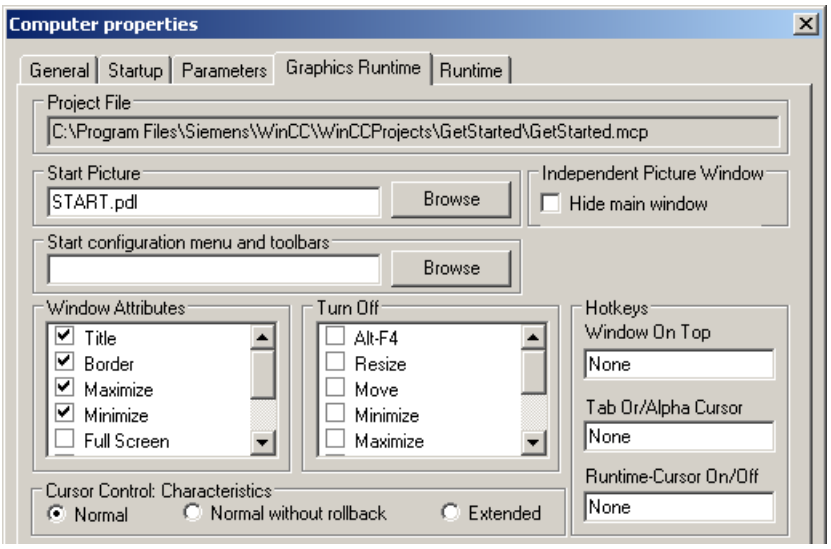
Configuring with WinCC Explorer

The runtime properties will have to be specified before you enable your project for the first time. The dialog Computer properties has been provided for this purpose. This dialog can be accessed via the pop-up menu of the component Computer in WinCC Explorer.

The Startup tab is used to specify which runtime components should be activated and which corresponding functions should be available in runtime. If, for example, your project contains cyclic actions, it will be necessary to activate the component Global Script Runtime.

To achieve maximum performance, it is recommended that you only activate the components you really require.

The Graphics Runtime tab can be used to define which screen should be displayed first once your project has been enabled (Start screen). It is also used to define the manner in which the WinCC project should appear on the screen.



Activate Project

Once you have defined the runtime properties you will be able to enable the project. The Enable command is located in the File menu in WinCC Explorer. Alternatively, you can use the button in the toolbar.

When the project has been enabled, the selected components of the Runtime software will be started. You will now be able to control and test the project.

WinCC Simulator

Using WinCC Simulator, you can test your WinCC project during the development phase without connecting the process peripherals or with connected process peripherals but without the process running.

- You will be able to define a fixed value for a tag.
- The value of a tag can also be modified automatically over the period of time, e.g. ascending, descending, in the form of a sine curve or on the basis of random variation.

The WinCC Simulator can be installed using the WinCC Setup program.

Testing Projects

All projects that are created with WinCC should be subjected to thorough and systematic checks like any other software. The first step involves testing on a module basis with simulated tag values. The second step involves testing the entire functionality of the project with all automation components.

Online Configuration

If a fault is ascertained during the testing phase, this can immediately be rectified in WinCC without stopping the process. Switch to the configuration software using the shortcut combination <ALT+TAB> to do so. Make the alteration, save the data and then return to the Runtime software. The process will run interruption-free with the new data.

Deactivating a Project

In order to deactivate your project, switch to the configuration software using the shortcut <ALT +TAB>. Click the Deactivate button in WinCC Explorer toolbar to stop runtime. Alternatively, you can also assign this function to a button in one of your screens.

See also

Guide Through Your Projects (Page 98)

WinCC Function Chart (Page 65)

Licensing (Page 36)

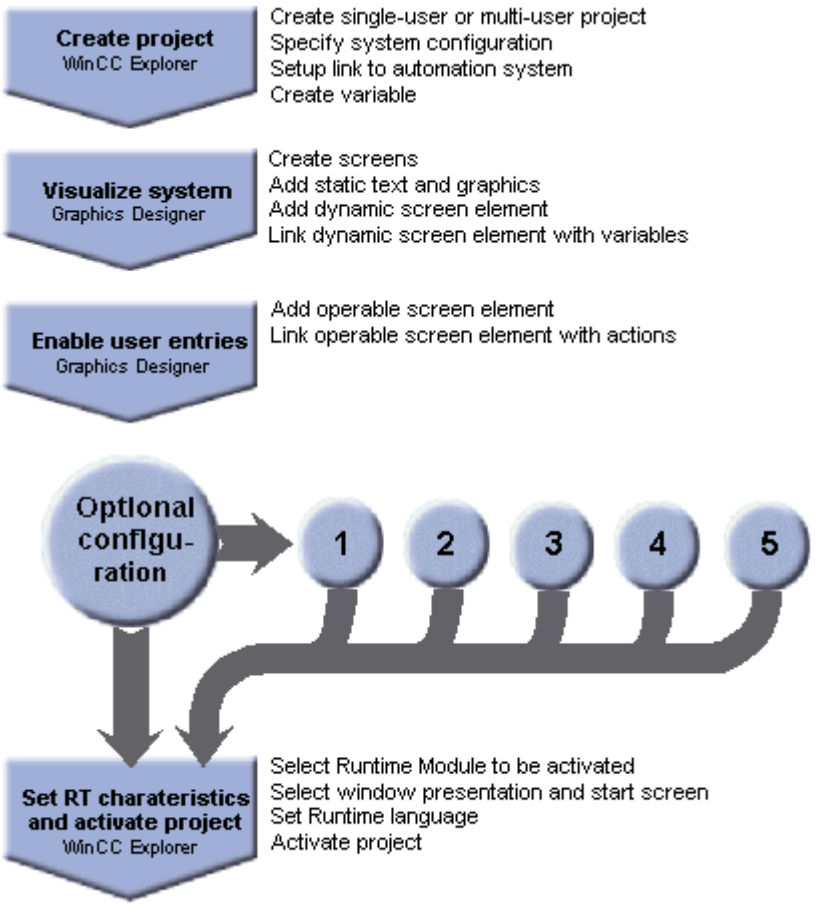
2.5.14 Guide Through Your Projects

Optimized Sequence

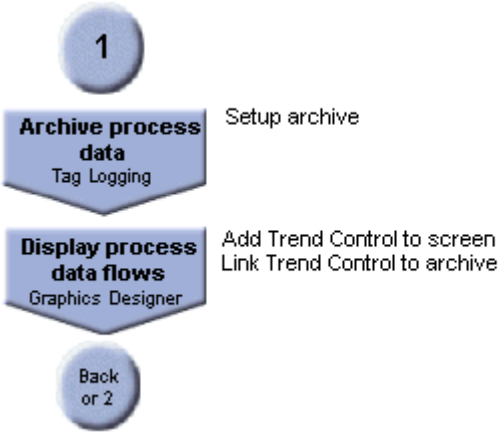
In WinCC, certain configuration steps supplement configuration steps already effected. Therefore, some configuration steps can only be effected after other steps have been carried out.

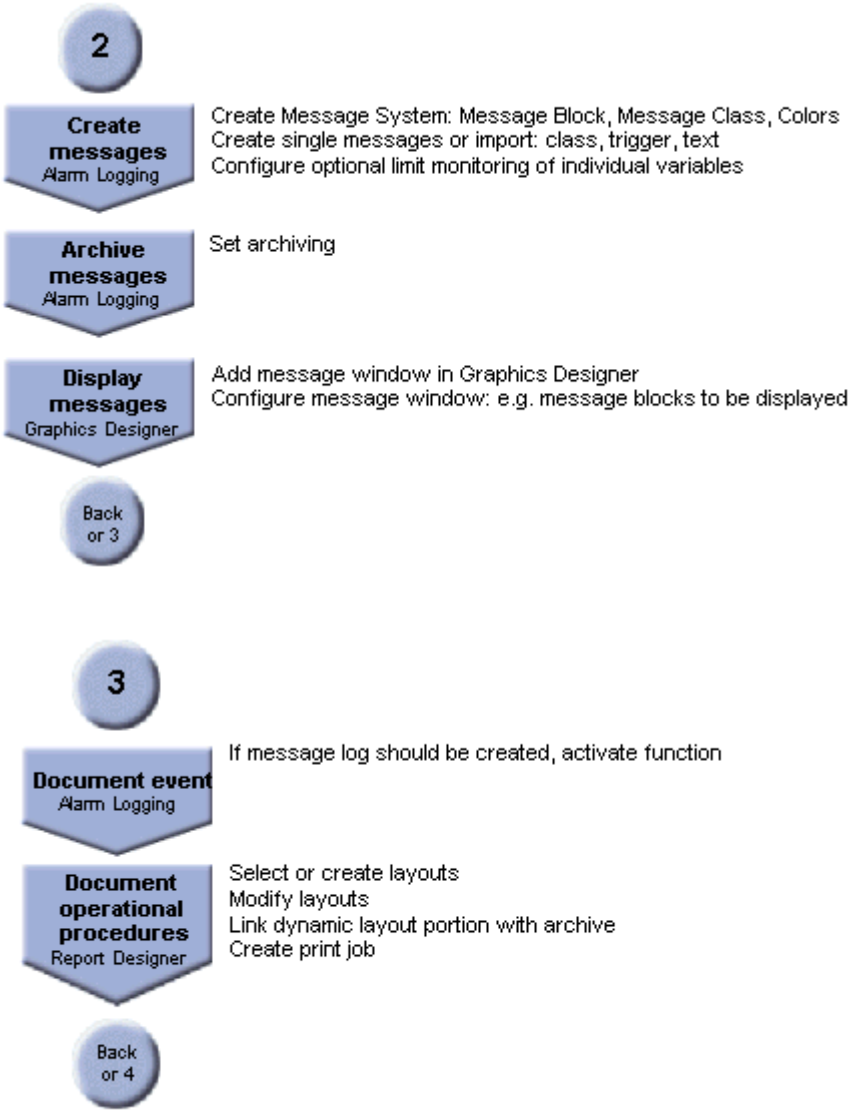
The following overview serves as a thread which will guide you through the configuration phase.

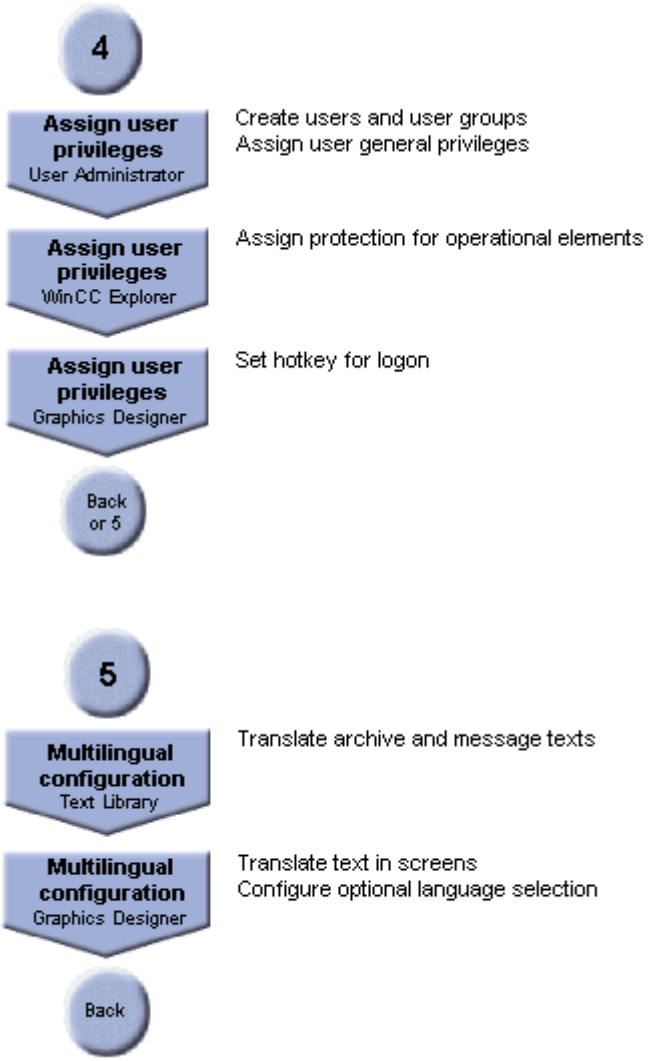
Mandatory Tasks



Optional Configuration




2
Create messages
Alarm Logging
Create Message System: Message Block, Message Class, Colors
Create single messages or import: class, trigger, text
Configure optional limit monitoring of individual variables
Archive messages
Alarm Logging
Set archiving
Display messages
Graphics Designer
Add message window in Graphics Designer
Configure message window: e.g. message blocks to be displayed
Back or 3
3
Document event
Alarm Logging
If message log should be created, activate function
Document operational procedures
Report Designer
Select or create layouts
Modify layouts
Link dynamic layout portion with archive
Create print job
Back or 4



See also

WinCC Function Chart (Page 65)

Migration 3

3 Resources

3.1 Introduction

Introduction

This chapter contains information concerning the migration of projects created with WinCC prior to version V7.0.

Working Steps for Migration to WinCC V7.0

WinCC V7.0 mainly differs from the previous versions in its capabilities for displaying runtime data. If you want to work with a project in WinCC V7.0, which was created with WinCC V6.x, you must adapt the project data accordingly with a migration.

Converting the pictures and the libraries is mandatory with the migration to WinCC V7.0. WinCC V7.0 provides you with the Project Migrator for converting the pictures and libraries. You can also convert the pictures and libraries manually using the Graphics Designer.

The configuration data and runtime data of a project are automatically migrated when opening the old project.

Prior to migration, it is recommended to make a backup copy of the original version of the project. Information on this is available in WinCC Information System under the topic "Working with WinCC" > "Working with projects" > "Duplicating and archiving projects".

Swapped files in WinCC V6.0

The WinCC Historian (Central Archive Server) is replaced by the WinCC CAS for swapping data as of WinCC V6.2.

If you have used the WinCC Historian (Central Archive Server) in WinCC V6.0, you can continue to use the server even after migration.

If you have not swapped any data in WinCC V6.0, then migrate your project to WinCC 7.0 and use the WinCC CAS if necessary.

Multi-user Projects

If you want to work in WinCC V7.0 with a multi-user project, which was created with WinCC V6.x, then migrate the individual multi-user projects from all servers in the system.

Redundant Systems in Normal Operation

A project can be upgraded in a redundant system without deactivating operation. This requires that you update the server, clients with their own project and clients without their own project in a certain sequence. Detailed instructions are provided in the Chapter "Upgrading Redundant Systems in Normal Operation".

CAUTION
In order not to affect system operation, it is essential to observe the sequence of steps described and to complete all the steps without any long interruptions. A client may always only be connected to one server, on which the same WinCC version is installed.

See also

Migration of WinCC Projects V6.0 and higher (Page 107)

Differences between predecessor versions and WinCC V7.0 (Page 105)

Conditions for Migration (Page 104)

3.2 Conditions for Migration

Introduction

A WinCC project can be migrated on any computer on which WinCC V7.0 has been installed. The standard scope of the installation of WinCC V7.0 also includes the Project Migrator.

Requirements

The computer on which the migration should be performed must fulfill the following conditions:

	Requirement
Operating system	The requirements are described in the chapters "Hardware Requirements" and "Software Requirements" of the Installation Manual.
CPU	
RAM	
Free memory space on the hard disk	at least the size of the CS database as well
User Rights	Local administrator rights
WinCC version installed	WinCC V7.0
WinCC version project data	WinCC V6.x

	Requirement
Licenses[1)]	• new CS license or RT license for Power Tags if necessary • if needed additional license for archive tags
System status	WinCC closed: • Runtime deactivated • WinCC Editors closed • WinCC Explorer closed

[1)] This licensing for WinCC V7.0 is different from version WinCC V6.0. You require new RT licenses or CS licenses. If more than 512 archive tags have been configured in a project, an additional license is required for archive tags. Detailed information may be found in Chapter "Upgrading Licenses" and in the WinCC Information System under the topic "Licensing".

3.3 Differences between predecessor versions and WinCC V7.0

Introduction

Version 7.0 of WinCC provides new and extended functions as compared to the predecessor version. An overview of the new features is provided in Chapter "What's New in WinCC V7?". The following paragraphs contain important information on the migration of projects.

Important differences of V7.0 in comparison with V6.2

WinCC V7.0 is different in the following features:

- In WinCC V7.0, new controls have been used for displaying messages, trends and tables. The previous controls from the migrated projects can still be used.
- New buttons and user objects have been implemented in WinCC V7.0. The previous buttons and user objects from the migrated projects can still be used.
- You can define a global design and a global color scheme for the WinCC project.
- The text management for constructing multilingual projects has been changed. Besides the "Text Library" editor, the Text Distributor is available for exporting/importing the data. The SmartTool "Easy Languages" is obsolete. More information can be obtained in the WinCC Information System under "Constructing Multilingual Projects".
- The Autodesk Volo View Control will no longer be delivered.

The differences of V7.0 in comparison with V6.0

WinCC V7.0 is different from V6.0 in the following features:

- In WinCC V7.0 WinCC/Central Archive Server (WinCC CAS) is used to implement the central archiving concept. WinCC Historian was used in WinCC V6.0.
  - If you have used WinCC Historian in WinCC V6.0, then you can continue to use the server after migration. The concept of WinCC V6.0 continues to be supported by V7.0 after migration of projects.
  - Use the WinCC CAS if you have not used the WinCC Historian in WinCC V6.0 but want to use a central archive server from WinCC V7.0 onwards.
- It is not possible to use compressed hard disks or disk drives.
- SQL Server 2005 is used as the database instead of SQL Server 2000.

Limitations

The differences between WinCC V6.x and WinCC V7.0 have lead to the following restrictions which must be taken into account when a project is migrated:

- Operating System:
  WinCC V7.0 will no longer run on Windows 2000. For help with conversion to Windows XP, Vista or Windows Server 2003, please contact the Microsoft Hotline.

Communication driver

The "SIMATIC S5 Ethernet TF" channel is no longer included in the scope of delivery of WinCC V7.0, since it was able to be implemented under Windows 2000 up to WinCC V6.2. Reconfigure this channel on the "Simatic S5 Ethernet Layer 4" channel. WinCC V7 provides the "Applicom Multi Protocol Suite" channel DLL upon request.

Windows DDE

The Windows DDE channel is contained in the scope of deliveries because it is compatible with earlier WinCC versions. New connections, however, should be created via the "OPC" channel.

New and no longer used standard print jobs and layouts

New standard print jobs and layouts have been introduced for the new controls with WinCC V7.0. You can continue to use the assigned standard print jobs and layouts for the controls previous to WinCC V7.0. After the migration, all previous layouts are stored in the "Language-neutral" subdirectory in the "Report Designer" directory in the WinCC Explorer.

The following standard print jobs and layouts can no longer be used in WinCC V7.0:

- @Report Alarm Logging RT Revolving archive (print job)
- @Report Alarm Logging RT Sequence archive (print job)
- @alrtfoa.RPL (layout)
- @alrtuma.RPL (layout)

Use the following print jobs and respective layouts instead:

- @Report Alarm Logging RT ShortTerm archive New (print job)
- @Report Alarm Logging RT Sequence archive New (print job)
- @CCAlgRtShortTermArchive.RPL (layout)
- @CCAlgRtSequenceArchive.RPL (layout)

3.4 Migration of WinCC Projects V6.0 and higher

3.4.1 Migration of WinCC Projects V6.0 and higher

Introduction

This chapter describes the migration of single-user projects, multi-user projects and clients with their own project, which have been created with WinCC V6.x.

You convert pictures and libraries with the Project Migrator. You can also convert the pictures and libraries manually using the Graphics Designer.

The configuration data and runtime data of a project are automatically migrated when opening the old project.

There is no difference between single-user projects, multi-user projects and clients with their own projects with regard to migration.

Note

The migration of a project can only be started once.

See also

Upgrading licenses (Page 108)

Migration Diagnostics (Page 128)

Additional Steps (Page 113)

Migrating Multi-User Projects (Page 112)

Migrate the WinCC data as follows (Page 109)

Preparations for Migration (Page 108)

3.4.2 Preparations for Migration

Introduction

Use the WinCC V7.0 Project Migrator for migrating projects created using WinCC V6.x. The Project Migrator will be displayed in the respective operating system language or in English.

The project has to be on the computer where migration is performed. This computer will subsequently be referred to as the "migration computer". Use the Project Duplicator to copy the project onto the migration computer. If Runtime data is to be migrated, the project must not be active in Runtime when duplicated. Information on copying projects is available in WinCC Information System under the topic "Working with projects" > "Duplicating and archiving projects".

Note

Make a backup copy of the project before the migration. This enables users to fall back on a copy of the original project in the case of faulty migration.

Time requirements

The Project Migrator indicates the expected time required before the migrations is started. The actual time required depends on the size of the migrated project as well as the performance capacity of the computer used and can deviate considerably from the specified time.

The migration of the configuration data normally takes less than an hour. The time required for migration of the Runtime data varies according to the number of messages and tags. It may take up to several hours.

See also

Migrate the WinCC data as follows (Page 109)

Differences between predecessor versions and WinCC V7.0 (Page 105)

Conditions for Migration (Page 104)

Upgrading licenses (Page 108)

3.4.3 Upgrading licenses

Introduction

Licensing of WinCC before WinCC V6.2 differs from its predecessor versions. All licenses must be upgraded to V7.0. New RT or RC licenses are required.

Licensing may be upgraded during the installation of WinCC V7.0 or subsequently. Detailed information is available in the WinCC Information System under the topic "Licensing".

To prevent switching to demo Mode during migration, licenses must be upgraded prior to migration.

Note

If an upgrade license is used, the authorizations for WinCC V6.x are converted to V7.0 licenses when upgrading to WinCC V7.0.

Upgrade of Licenses

After purchasing a WinCC Upgrade Packet V6.x, upgrade the licenses using the enclosed Powerpack license data medium with upgrade license. The existing authorizations are upgraded to WinCC V7.0 authorizations.

Procedure

1. Insert the USB stick of WinCC in the USB port.
2. Start the Automation License Manager using the Start menu. In the navigation window, select the drive where the license to be upgraded is located. Select this license from the table.
3. Select menu instruction "License Key" > "Upgrade...". The upgrade process is started.
4. The upgrade process concludes with the transfer of the upgraded license to the local drive.

See also

Additional Steps (Page 113)

Preparations for Migration (Page 108)

3.4.4 Migrate the WinCC data as follows

Introduction

The migration of the project to WinCC V7.0 includes the configuration data and the runtime data and the converting of the pictures and libraries. Converting the pictures and libraries is mandatory. The configuration data and runtime data of a project are automatically migrated when opening the old project.

Note

A project can only be migrated once.

Make a backup copy of the project before the migration. This enables users to fall back on a copy of the original project in the case of faulty migration.

Converting Pictures and Libraries

Pictures and libraries may be converted as follows:

- Use the Project Migrator to perform the conversion in one step. Project Migrator will automatically recognize the version of the source project and will deactivate certain options for the conversion accordingly.
- Pictures and libraries may also be converted manually and individually by selecting the following function in the pop-up menu of Graphics Designer in WinCC Explorer:
  - Convert project library
  - Convert global library
  - Converting pictures

Limitations

Pictures may only be converted when they do not contain "Unknown Objects". "Unknown Objects" are picture objects whose associated object server is not installed, e.g. unregistered ActiveX Controls.

Note

Convert pictures and libraries only if Runtime is not active.

Implement the conversion for multi-user systems on the server.

The conversion of pictures during migration may not be interrupted.

Conversion of pictures and libraries will be canceled after 18 hours.

If an error occurs during conversion of pictures and libraries using the Project Migrator, the migration will not be interrupted. The Project Migrator writes an error message in a diagnostics file and processes the next components. Project Migrator will report the error once the migration is complete.

Error messages and warnings are recorded by WinCC in a log file called CONVERT.LOG. The file CONVERT.LOG may be found in the graphics directory "GraCS" of the current WinCC project.

NOTICE

Conversion of libraries using the pop-up menu of Graphics Designer starts immediately as soon as you have selected the entry. No confirmation prompt appears.

If pictures have been saved once or converted using WinCC V7.0, then you cannot open them again with a previous version of WinCC.

Conversion of the pictures and libraries cannot be undone. A downwards conversion from WinCC V7.0 pictures back to WinCC V6.x pictures is not possible.

If you select a picture that is not converted, it can lead to faulty WinCC operation.

Converting the Project Library and the Global Library

The project library contains project-specific graphic objects which have been created for the project. If a project library has been used, the library must be converted.

In order to continue using the global library used to date, it must also be converted.

Migration Prerequisites

The project has to be on the computer where migration is performed. Use the Project Duplicator to copy the project onto the migration computer. Information on copying projects is available in WinCC Information System under the topic "Working with projects" > "Duplicating and archiving projects".

Close WinCC before the migration:

- Deactivate Runtime
- Close the WinCC editors
- Close WinCC Explorer

Procedure

1. Open "Simatic > WinCC > Tools > Project Migrator" in the operating system Start menu. The Project Migrator's start menu "CCMigrator - Step 1 of 3" opens.
2. Click "Next".
   The "CCMigrator - Step 2 of 3" window opens up.
3. Select the project directory, in which the V6 project is located by clicking on  .
4. Click "Next".
   The "CCMigrator - Step 3 of 3" window opens up. The Project Migrator shows the steps of the migration. The Project Migrator indicates the estimated migration duration: "Estimated Migration Duration: XX hour(s) XX minute(s)". This specification is only a rough guideline value. Migration of a project can take several hours.
5. If the migration should not be executed, click the "Cancel" button. The Project Migrator is closed. Migration can be started again later.
6. Click the "Finish" button.
   The Project Migrator starts the migration and checks off all steps of the project, which have been migrated.
7. When the migration is completed successfully, the Project Migrator displays the message: "Data was successfully migrated".
8. Click OK to close the dialog.
9. Before you adapt the project to WinCC V7.0, the migrated project must be started in Runtime and closed again. You will find more information in the section entitled "Additional steps".

See also

Migration Diagnostics (Page 128)
Migrating Multi-User Projects (Page 112)
Additional Steps (Page 113)
Preparations for Migration (Page 108)
Conditions for Migration (Page 104)
Upgrading licenses (Page 108)

3.4.5 Migrating Multi-User Projects

Introduction

Clients are migrated together with the associated multi-user project.

When migrating multi-user projects, proceed in exactly the same way as in the migration of single user projects.

Make a backup copy of the project before the migration. This enables users to fall back on a copy of the original project in the case of faulty migration.

Note

The WinCC V6 client accesses one server or several servers according to the configuration.

Multi-user System with One Server

In a multi-user system, all required data is transferred to the server when migrating the multi-user project.

No data is stored on clients created in multi-user projects. Therefore, no client projects are created in the WinCC clients in WinCC V7.0. The settings necessary for the WinCC clients and respective preferred server are defined in the multi-user project.

Following migration, a package must be created in the multi-user project. If an existing package was deleted for this, the newly created package must have the same name.

In the "ServerData" editor, activate the "Automatic import" setting under "Implicit Update". This provides the clients without a local project with the necessary data.

Multi-user System with Several Servers

If clients with a local project were used in the original project, migrate each client product individually. Proceed in exactly the same way as for a single user project or a multi-user project. After migration, create new packages on the servers and load them onto the client. If existing packages were deleted, the newly created packages must get the respective names of the deleted packages.

It is possible that the original system uses several clients with their project with the same configuration and runtime data. In this case, migrate one client with their own project and copy to the other WinCC clients. Use the Project Duplicator for this. Then load the packages of the respective servers on each client.

Note

The following restrictions apply after the migration of multi-user systems:

Access to clients: Automatic, simultaneous booting of several clients is no longer possible. Each server in the system can be activated by using the "Simatic Shell" dialog for remote access.

Deactivating servers and clients in multi-user systems: An automatic, simultaneous booting of several servers and clients is no longer possible. Each server in the system can be deactivated by using the "WinCC Projects" dialog for remote access.

See also

Upgrading licenses (Page 108)

Adaptations in the Project (Page 114)

Migrate the WinCC data as follows (Page 109)

3.4.6 Additional Steps

3.4.6.1 Additional Steps

Introduction

After migration, you still have to adapt certain settings in the project:

- Adapting the computer name
- Adapting process controlled archive tags, if necessary
- Adapting and Reconfiguring Process Tags
- if required, adapting the setting for "SIMATIC Logon" in the user administration
- Adapting the setting for global color schemes to dynamize object properties
- Restoring VBA extensions with the @GLOBAL.PDT file
- Adapting multi-user projects (load packages, adapt user administration, configure redundant connection)
- Entering the User Archives option in the startup list of WinCC computer properties, if necessary
- Adapting Project Documentation
- Modifications for Basic Process Control

See also

Migration Diagnostics (Page 128)

Upgrading licenses (Page 108)

Adaptations in the Project (Page 114)

3.4.6.2 Adaptations in the Project

Adapting Computer Name

If the migrated project was originally installed on another computer, the original computer name is still specified. On opening the project for the first time on the new computer, the following dialog appears:

- "The configured server is not available. Do you want to open the project with the local computer as server?"

Select the "Start server locally". After opening the project, change the computer name in the "Computer properties" dialog.

Adapting Process Controlled Archive Tags

If the "Compile OS" function is used, the assignment of the process controlled archive tags changes. The name of process controlled archive tags is no longer defined according to the raw data tag ID. The name of the raw data tag is used instead. These tags must be converted in order to adapt the assignment, e.g. in Controls. To do this, open the "Properties" dialog of the archive tags once and then close the dialog without making any changes.

If the "Compile OS" function is not used, the process controlled archive tags can continue to be used in their original structure in WinCC V7.0.

Reconfiguring process tags from channels no longer supplied

If you use channels in your project which are no longer contained within the scope of delivery, the respective links to their process tags are not displayed in Tag Management after the migration. When the tag management is opened for the first time, a dialog appears containing the relevant information. The necessary driver can be installed later and used with WinCC V7.0. The relevant recommendations are explained in the Chapter "Differences Between Predecessor Versions and WinCC V7.0".

Prior to migration, the process tags in question can be reconfigured, e.g. using the WinCC configuration tool, and then used with another communication driver.

Adapt the setting for "SIMATIC Logon" in the user administration

If you migrated a project from a WinCC version prior to V6.0 SP3, in which SIMATIC Logon was used, you must check the setting "with/without SIMATIC Logon" in the user administrator and adapt it if necessary.

Making certain object properties dynamic with a global color scheme

The object properties of the graphic objects that are permanently defined with activated global color scheme, cannot be changed by being made dynamic. If you give a new design to graphic objects of migrated projects in WinCC V7.0, the dynamics that relate to the appearance of the objects no longer have the same effect.

The "Global color scheme" object property is therefore set to "No" for the migration. Only the newly inserted objects are applied with "Yes". If you do not want to connect these objects with the color scheme from the global design, you can adapt the property for the desired objects.

Restoring VBA extensions with the @GLOBAL.PDT file

The "@GLOBAL.PDT" file in the directory <WinCC installation directory>\Templates contains your global VBA extensions, e.g. own menus.

If you install WinCC V7.0, the file "@GLOBAL.PDT" is automatically renamed to "@GLOBAL.SAV" and replaced through a new file "@GLOBAL.PDT".

First delete the new file "@GLOBAL.PDT" and again rename the "@GLOBAL.SAV" for accessing your VBA extensions after installing the upgrade.

Multi-user Projects

Load Packages

After migration of a multi-user project, the packages must be created on the server and loaded onto the clients. Information on this is available in the WinCC Information System under "Configuration > Multi-user systems > "Server configuration" or "Client configuration".

Adapting User Administration

If a project has been migrated with standard clients, the clients are assigned the rights "1000" and "1001" during the migration. This enables the clients to remotely enable and configure the project.

If a client's authorization is changed to "1002" in User Administrator, this client can only be used for monitoring.

Configure Redundant Connection

If you are upgrading a redundant system from WinCC V6.0, then you must configure an additional redundant connection.

For a redundant system, WinCC has required a redundant connection via Ethernet, Firewire or the serial interface since V6.2.

Entering the User Archives Option in the Startup List of WinCC Computer Properties

As of WinCC V6.0 SP2, the User Archives option must be entered in the startup list in WinCC computer properties instead of the "Additional Tasks/Applications" field.

In order to accept these changes in your existing projects, open the User Archives editor and save your data.

Alternatively, you may update the startup list in WinCC Explorer in the "Computer Properties" dialog using the "Startup" tab:

1. In the field "Additional Tasks/Applications", delete the entry "CCUsrAcv.exe".
2. Activate the entry "User Archives" in the "Start Sequence of WinCC Runtime" field.

Adapting Project Documentation

WinCC V7.0 provides new layouts. During migration, however, only the layouts from the original project are transferred.

The layouts from WinCC V6.x can also be used in the migrated project. Copy the required layouts from the directory

- WinCC\Syslay

to the directory

- <Project folder>\PRT

Standard print jobs and layouts no longer used

The following standard print jobs and layouts can no longer be used in WinCC V7.0:

- @Report Alarm Logging RT Revolving archive (print job)
- @Report Alarm Logging RT Sequence archive (print job)
- @alrtfoa.RPL (layout)
- @alrtuma.RPL (layout)

Use the following print jobs and respective layouts instead:

- @Report Alarm Logging RT ShortTerm archive New (print job)
- @Report Alarm Logging RT Sequence archive New (print job)
- @CCAlgRtShortTermArchive.RPL (layout)
- @CCAlgRtSequenceArchive.RPL (layout)

See also

Differences between predecessor versions and WinCC V7.0 (Page 105)

Upgrading licenses (Page 108)

Preparations for Migration (Page 108)

3.4.6.3 Modifications for Basic Process Control

Additional Steps with Basic Process Control

When Basic Process Control or a PCS7 OS is used, the OS project editor must be executed after the project has been fully migrated.

Use the OS project editor to specify that the new message pictures and associated layouts are to be used in the project. Activate the option "Apply Delivered State" on the "Basic Data" tab in the area "Base Pictures in Project Deviate from Delivered State".

3.5 Upgrading a Redundant System in Normal Operation

3.5.1 Upgrading a Redundant System in Normal Operation

Introduction

A redundant system operating with WinCC V6.x is upgraded in steps to WinCC V7.0. This does not affect the functioning of the system.

Read the instructions carefully before beginning with the upgrading work.

Compare the initial situation described in the quick reference instructions with your system and prepare your system accordingly.

Note

Framework Conditions for Upgrading During Ongoing Operation

Upgrading WinCC V5.x to WinCC V7.0 during operation is not possible. You must first upgrade to the last released version of WinCC V6 version as an intermediate step.

Multi-user systems, in which clients can be used without a separate project, are not intended for upgrading during ongoing operation.

A client may always only be connected to one server, on which the same WinCC version is installed.

An upgrade is not possible in WinCC ServiceMode.

Objective

- The automation system remains permanently in Runtime.
- The process is constantly operable.

Process

Upgrading consists of the following phases:

1. Upgrading the Standby Server
2. Upgrade WinCC clients
3. Upgrading Master Server
4. Defining Master Server

3.5.2 Quick Reference Instructions: Upgrading Redundant Systems in Normal Operation

Introduction

A redundant system in operation is upgraded in four phases. Each phase is divided into individual working steps. The necessary working steps are listed in the Section "Procedure". Detailed instructions are provided in the chapters "Phase 1" to "Phase 4".

Initial Situation

- Server1 is the master server.
  (Server1 stands for all master servers in a redundant server pair.)
- Server2 is the standby server.
  (Server2 stands for all standby servers in a redundant server pair.)
- WinCC Client1 is connected to Server1.
  (WinCC Client1 stands for all WinCC clients originally connected to Server1, which should be reconnected with Server1 after the migration.)
- WinCC Client2 is connected to Server2 because it is configured for it as the preferred server.
  (WinCC Client2 stands for all WinCC clients originally connected to Server2, which should be reconnected with Server2 after the migration.)

Procedure - Quick Reference

CAUTION
In order not to interrupt operation of the system, observe the sequence of steps described. The working steps from Phase 1 to Phase 4 must be completed without any longer interruptions.

Note

Create a backup of the entire system before upgrading the server.

Configure a preferred server for all clients to be upgraded.

Phase 1: Upgrading the Standby Server

1. WinCC Client1: Configure Server1 as preferred server
2. WinCC Client2: Configure Server1 as preferred server
3. Server2: Deactivate
4. Server2: Exit WinCC
5. Server2: Reboot the computer
6. Server2: Installing WinCC V7.0
7. Server2: Migrate project
8. Server2: Activate
9. Server2: Other redundant server pairs: Execute Steps 1 to 8

Phase 2: Upgrade WinCC clients

10. WinCC Client2: Deactivate and exit WinCC
11. WinCC Client2: Reboot the computer
12. WinCC Client2: Installing WinCC V7.0
13. WinCC Client2: Migrate project
14. WinCC Client2: Configure Server2 as preferred server
15. WinCC Client2: Activate
16. WinCC Client1 and other WinCC clients: Execute Steps 10 to 15

Phase 3: Upgrading Master Server

17. Server1: Deactivate and exit WinCC
18. Server1: Reboot the computer
19. Server1: Installing WinCC V7.0
20. Server1: Migrate project
21. Server1: Activate
22. WinCC Client1: Loading Packages and Configuring the Preferred Server
23. WinCC Client2: Loading Packages and Configuring the Preferred Server
24. Other redundant server pairs: Execute Steps 17 to 23

Phase 4: Defining Master Server and Completing Upgrade

25. Switch master server manually

Results

When all the working steps from 1 to 25 have been completed, the system has the following status:

- Upgraded Server1 is the master server.
- Upgraded Server2 is the standby server.
- Upgraded WinCC Client1 is connected to its preferred server Server1.
- Upgraded WinCC Client2 is connected to its preferred server Server2.

Upgrading the redundant system to WinCC V7.0 is completed.

Note

Following migration of a server, the respective packages must be regenerated on this server. Following migration of a client with own project, the respective packages must be regenerated on this server.

3.5.3 Phase 1: Upgrading the Standby Server

Introduction

In the first phase, the redundant standby server Server2 is upgraded. This prevents an unnecessary redundancy switching by WinCC clients.

While carrying out the working steps in Phase 1, the system runs on just one server.

CAUTION

In order not to interrupt operation of the system, observe the sequence of steps described.

The working steps from Phase 1 to Phase 4 must be completed without any longer interruptions.

Note

Create a backup copy before upgrading the server.

Initial Situation Prior to Phase 1

- Server1 is master server and is configured as the standard master.
  (Server1 stands for all master servers in a redundant server pair.)
- Server2 is the standby server.
  (Server2 stands for all standby servers in a redundant server pair.)

- WinCC Client1 is connected to Server1.
  The package of the master server is loaded onto WinCC Client1.
  (WinCC Client1 stands for all WinCC clients originally connected to Server1, which should be reconnected with Server1 after the migration.)
- WinCC Client2 is connected to Server2 because it is configured for it as the preferred server.
  The package of the master server is loaded onto WinCC Client2.
  (WinCC Client2 stands for all WinCC clients originally connected to Server2, which should be reconnected with Server2 after the migration.)

Procedure, Phase 1

For a detailed description of the procedure, please click one of the following working steps.

Note

Please note that you must work alternately on Server1 and Server2.

1. WinCC Client1: Configure Server1 as preferred server

So that each client is connected with the associated server during the upgrade, a preferred server must be configured for all clients in the system.

If a preferred server is not yet configured for WinCC Client1, then enter Server1 as the preferred server.

Deactivate WinCC Client1 and reactivate the client so that the changed preferred server is applied.

2. WinCC Client2: Configure Server1 as preferred server

Configure Server1 as the preferred server for WinCC Client2.

Deactivate WinCC Client2 and reactivate the client so that the changed preferred server is applied.

WinCC Client2 connects with Server1.

3. Server2: Deactivate

Deactivate WinCC Runtime on the Standby Server, Server2.

The system behaves as follows:

- WinCC Client1 remains connected to Server1.
- WinCC Client2, for which Server1 is now configured as the preferred server, remains connected to Server1.
- Server1 detects an interruption through the deactivation of Server2.
  If you have configured system messages, Server1 then creates a corresponding process control message.

Create a backup of Server2 and save the WinCC data before you upgrade the server.

4. Server2: Exit WinCC

End WinCC on the existing standby server Server2.

5. Server2: Reboot the computer

Close Windows and restart Server2.

6. Server2: Installing WinCC V7.0

A WinCC V7.0 Server only runs with the system prerequisites described in the "Installation Notes" of the WinCC Information System.

Install WinCC V7.0 with all the necessary options or execute an update. Information on installation is available in the WinCC Information System under the topic "Installation Notes".

For a redundant system, WinCC has required a redundant connection via Ethernet, Firewire or the serial interface since V6.2. If you are upgrading from WinCC V6.0, then configure this additional redundant connection.

7. Server2: Migrate project

Migrate the WinCC data of Server2 to WinCC V7.0.

Modify the project for WinCC V7.0 after the migration. See the corresponding instructions in chapter "Migration of WinCC Projects as of V6.0 > Additional Steps".

Note

Following migration of a server, the respective packages must be deleted and regenerated on this server. The package must have the same name as the deleted package.

8. Server2: Activate

1. Start WinCC on Server2.
2. Activate WinCC Runtime.

The system behaves as follows:

- There is no server switching. The activated Server2 becomes the standby server in the upgraded WinCC V7.0 project.
- The WinCC Client1 remains connected to Server1.
- The WinCC Client2 remains connected to Server1.

For the next step, wait until the redundancy synchronization is complete. If you have configured system messages, Server1 then creates a corresponding process control message.

9. Other redundant server pairs: Execute Steps 1 to 8

If several redundant server pairs are implemented, the respective standby server, Server2, must be upgraded.

Execute steps 1 through 8 for each Server2.

Complete the upgrading of one standby server before beginning with upgrading the next standby server.

Result of Phase 1

- Standby Server2 has been upgraded.
- WinCC Client2 is connected to Server1.
- WinCC Client1 is connected to Server1.

3.5.4 Phase 2: Upgrade WinCC clients

Introduction

In Phase 2 you will upgrade all WinCC Clients to WinCC V7.0 clients.

In order for the system to remain operable, at least one WinCC client must remain connected to an active server of the same WinCC version during the upgrade. The same WinCC version must run on this server as on the WinCC client.

Initial Situation Prior to Phase 2

- Server1 is master server in the V6.x project.
- Upgraded Server2 is the standby server in the migrated V7.0 project.
- WinCC Client1 is connected to Server1.
- WinCC Client2 is connected to Server1.

Procedure, Phase 2

For a detailed description of the procedure, please click one of the following working steps.

10. WinCC Client2: Deactivate and exit WinCC

Deactivate WinCC Runtime on the WinCC Client2 and exit WinCC.

11. WinCC Client2: Reboot the computer

Close Windows and restart the WinCC client.

12. WinCC Client2: Installing WinCC V7.0

A WinCC V7.0 client only runs with the system prerequisites described in the "Installation Notes" of the WinCC Information System. Create a backup of the client and save the WinCC data before the installation.

Install WinCC V7.0 with all the necessary options or execute an update. Information on installation is available in the WinCC Information System under the topic "Installation Notes".

13. WinCC Client2: Migrate project

Migrate the WinCC data of the WinCC Client to WinCC V7.0.

Modify the project for WinCC V7.0 after the migration. See the corresponding instructions in chapter "Migration of WinCC Projects as of V6.0 > Additional Steps".

Note

Following migration of a WinCC client with own project, the packages must be reloaded to the migrated server.

14. WinCC Client2: Enter Server2 as preferred server

Change the preferred server in the migrated WinCC client and enter Server2 instead of Server1.

15. WinCC Client2: Activate

1. Start WinCC on the migrated WinCC client.
2. Activate WinCC Runtime.

The system behaves as follows:

- The WinCC client connects to the upgraded Server2.
- Server2 remains the standby server.

16. Other WinCC clients: Execute Steps 10 to 15

For WinCC Client1, the same procedure applies as for WinCC Client2.

When a WinCC client has been upgraded, repeat steps 10 to 15 for the next WinCC client until all the WinCC clients in the system have been upgraded.

After the upgrade, also enter Server2 as the preferred server for WinCC Client1.

Complete the upgrading of one WinCC client before beginning with the upgrading of the next WinCC client.

Result of Phase 2

- Upgraded WinCC Client2 is connected to the upgraded Server2 as the preferred server.
- Upgraded WinCC Client1 is connected to Server2 as preferred server.

- Server1 is master server in the V6.x project.
- Upgraded Server2 is the standby server in the migrated V7.0 project.

3.5.5 Phase 3: Upgrading Master Server

Introduction

In Phase 3, the master server Server1 is upgraded.

While carrying out the working steps in Phase 3, the system runs on just one server. The system can be operated via the WinCC clients upgraded in Phase 2. Further information on redundancy synchronization is available in the WinCC Information System under the topic "Configurations > Redundant Systems".

Note

If necessary, create a backup copy before upgrading the server.

Initial Situation Prior to Phase 3

- Server1 is master server in the V6.x project.
- Upgraded Server2 is the standby server in the migrated V7.0 project.
- The redundancy synchronization of Server1 and Server2 is complete.
- Upgraded WinCC Client1 is connected to Server2.
- Upgraded WinCC Client2 is connected to its preferred server Server2.

Procedure, Phase 3

For a detailed description of the procedure, please click one of the following working steps.

Note

Please note that you must work alternately on Server1 and Server2.

17. Server1: Deactivate and exit WinCC

1. Deactivate WinCC Runtime on the master server Server1.
2. Exit WinCC on the server.

Create a backup of Server2 and save the WinCC data before you upgrade the server.

18. Server1: Reboot the computer

Close Windows and restart Server1.

19. Server1: Installing WinCC V7.0

A WinCC V7.0 Server only runs with the system prerequisites described in the "Installation Notes" of the WinCC Information System. First, save the WinCC data on the server if necessary.

Install WinCC V7.0 with all the necessary options or execute an update. Information on installation is available in the WinCC Information System under the topic "Installation Notes".

If you are upgrading from WinCC V6.0, then configure this additionally required redundant connection.

20. Server1: Migrate project

Migrate the WinCC data of the server to WinCC V7.0.

Modify the project for WinCC V7.0 after the migration. See the corresponding instructions in chapter "Migration of WinCC Projects as of V6.0 > Additional Steps".

Note

Following migration of a server, the respective packages must be regenerated on this server. The package must have the same name as the original package.

21. Server1: Activate

1. Activate WinCC Runtime.

The system behaves as follows:

- Server1 becomes the standby server.
- Archive synchronization is performed for the message archives, process value archives and user archives.
- If system messages have been configured, a corresponding process control message is generated.
- All the values during the downtime period are synchronized.

22. WinCC Client1: Loading Packages and Configuring the Preferred Server

Load the Server1 package to the WinCC clients.

Configure Server1 as the preferred server for WinCC Client1.

Deactivate and activate the respective client to apply the changed configuration to the preferred server.

- The WinCC Client1 connects to the upgraded preferred server, Server1.

23. WinCC Client2: Loading Packages and Configuring the Preferred Server

Load the Server1 package to the WinCC clients.

Configure Server2 as the preferred server for WinCC Client2.

Deactivate and activate the respective client to apply the changed configuration to the preferred server.

- The WinCC Client2 connects to the master server, Server2.

24. Other redundant server pairs: Execute Steps 17 to 23

If several redundant server pairs are implemented, then upgrade the master server, Server_1.

Execute steps 17 through 23 for each Server1.

Complete the upgrading of one server before beginning with the upgrading of the next server.

Result of Phase 3

- Upgraded Server1 is the standby server.
- Upgraded Server2 is the master server.
- Upgraded WinCC Client1 is connected to its preferred server Server1.
- Upgraded WinCC Client2 is connected to its preferred server Server2.

3.5.6 Phase 4: Defining Master Server and Completing Upgrade

Introduction

After upgrading the system, all WinCC clients, for which no preferred server has been configured, are connected to the master server. As a result of the redundancy switching for upgrading, the original master server, Server1, was set to standby server. The original standby server, Server2, was set to master server.

In order to restore the original status, the master server must be reset manually. Follow the instruction for working step 25. This step concludes the upgrading procedure of the redundant system to WinCC V7.0.

Further information on preferred servers in redundant systems is available in the WinCC Information System under the topic "Configurations > Redundant Systems".

Initial Situation Prior to Phase 4

- Server1 is the standby server.
- Server2 is the master server.

- WinCC Client1 is connected to its preferred server, Server1.
- WinCC Client2 is connected to its preferred server, Server2.

Procedure, Phase 4

For a detailed description of the procedure, click working step 25:

25. Switch master server manually

In order to restore the initial situation of the system, define Server1 as the master server manually.

Set the redundancy tag "@RM_Master" on Server1 from 0 to 1. You can query and set the redundancy tag "@RM_Master" via an I/O field, for example:

1. Configure an I/O field in the multi-user project from Server1.
2. Link the I/O field with the @RM_Master tag.
3. Enter a "1" in the I/O field in Runtime. Server1 becomes the master server. As a result of the redundancy switching, Server2 becomes the standby server.

Alternatively, the redundancy tag can be set via scripts.

Result of Phase 4

- Server1 is the master server.
- Server2 is the standby server.
- WinCC Client1 is connected to its preferred server, Server1.
- WinCC Client2 is connected to its preferred server, Server2.

Upgrading the redundant system to WinCC V7.0 is completed.

3.6 Migration Diagnostics

Introduction

In the following cases, migration can lead to error messages or cancelation:

- The migration computer has too little memory space available.
- The project is not loaded on the migration computer.
- The project was created with a WinCC version earlier than V6.0.

When a fault occurs, clear the fault in a copy of the migrated project. Then restart the migration.

Prior to each migration, make a backup copy of the project.

Errors During Migration

An error during the migration of a component does not interrupt the migration. The Project Migrator writes an error message in a diagnostics file and processes the next components. When the migration has finished, the Project Migrator displays the message:

- "Migration has finished with errors.
  See <Pfad>\CCMigrator.txt file for details."

Cancelation of Migration

When the migration is canceled, migration can be restarted after clearing the fault. Do not use the project containing the faulty migrated project, but a copy of the backup.

Diagnostics Files

The Project Migrator creates two diagnostics files:

- CCMigrator.txt
- DTSPackages.log

The diagnostics files are stored in the project directory of the migrated projects. The files can be viewed in any text editor.

CCMigrator.txt

The "CCMigrator.txt" file contains general information: Project name, project type, type of migrated data, start and end of migration. If the migration was successful, the file contains the message: "Migration succeeded.".

If an error occurs during migration, the Project Migrator writes an error message in the file. Details are provided in the "DTSPackages.log" file.

DTSPackages.log

The Project Migrator protocols the migration of the individual components in "DTSPackages.log" file. If an error occurs, the Project Migrator writes a short error message in the file.

The diagnostics file contains the following important entries:

Message text	Description
Package name	Migrated component
Package description	Function of the migrated component
Executed on	Migration computer
Executed by	Users
Execution started / Execution completed	Time: start of migration / Time: end of migration
Total execution time	Time required for component migration

Message text	Description
Package steps execution information	Migration steps of a component, specifying whether migration was successfully executed: "succeeded" = successful / "failed" = error during migration
Error source / Error description	Error source and description of the error which occurred

Diagnostics file for converting pictures

When you convert pictures, WinCC records error messages and warnings in a log file called CONVERT.LOG. The file CONVERT.LOG may be found in the graphics directory "GraCS" of the current WinCC project.

See also

Migration of WinCC Projects V6.0 and higher (Page 107)

3.7 Appendix

3.7.1 Documentation of Functions of Predecessor Versions

Introduction

You will find information on functions and documentation of the predecessor versions in this chapter.

Overview

Information on functions and documentation concerning the predecessor versions:

- The documentation on the controls before WinCC V7 are located following the description of the new controls.
- The documentation for previous user objects is still located in the WinCC Information System.
- The appendix also contains documentation on the WinCC Push Button Control.

3.7.2 WinCC Push Button Control

3.7.2.1 The "WinCC Push Button" Control

Introduction

- The "WinCC Push Button" control can be used to configure a command button, which is connected to the execution of a command.
  In Runtime the Push Button can adopt the states "Pressed" and "Not pressed". Both statuses can be assigned a different image, which shows the current state of the button.

Insert Push Button

The Push Button is inserted from the object palette into a picture:

- As a Smart Object:
  The Smart Object "Control" is inserted from the "Standard" tab of the Object Palette. The Push Button is selected in the dialog "Insert a Control".
- from the tab "Controls"
  The Push Button is inserted from the "Controls" tab of the Object Palette.

The properties of the control are changed in the configuration dialog "Properties of the WinCC Push Button Control" or in the window "Object Properties".

Project Documentation Features in Graphics Designer

The attributes for the "Push Button" control object are listed in the Graphics Designer project documentation.

The following correlation applies to the output of object data for the attributes "PictureSelected" and "PictureUnselected":

- If there is no picture entered, a hyphen "-" is output in the project documentation.
- If a picture is entered, "none" is output.

See also

How to Assign Pictures to the Push Button (Page 135)

How to Change the Font of the Push Button (Page 134)

How to Change the Color of the Push Button (Page 133)

How to Change the Appearance and Labeling of the Push Button (Page 132)

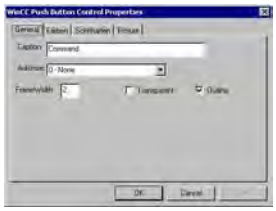
3.7.2.2 How to Change the Appearance and Labeling of the Push Button

Introduction

On the "General" tab, you have the option to adapt the general appearance of the Control. In addition, you can also enter a function description as a labeling of the Push Button.

Requirements

- Double-click the inserted control to open the "WinCC Push Button Control Properties" dialog.
- Select the "General" tab.



Caption

Enter here a text for the labeling of the button. This label can, for instance, contain a function description.

Autosize

For the geometry of the Push Button, you can configure automatic size adaptation.

Select option 0 - None, in order to disable the automatic size adaptation. With option 1 - Adjust Picture Size To Button the size of the image is adapted to the geometry of the button. Select option 2 - Adjust Button Size To Picture, in order to adapt the geometry of the Push Button to the size of an assigned picture.

Frame Width

Enter a value for the 3D Border Width of the button in pixel(s).

Transparent

The background of the button can be displayed transparent. In this case, the configured background color is not shown.

Outline

The 3D border of the Push Button can be surrounded with an additional outer border line.

See also

The "WinCC Push Button" Control (Page 131)

How to Assign Pictures to the Push Button (Page 135)

How to Change the Font of the Push Button (Page 134)

How to Change the Color of the Push Button (Page 133)

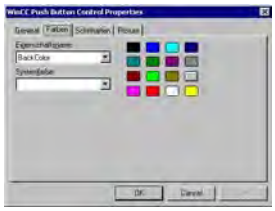
3.7.2.3 How to Change the Color of the Push Button

Introduction

You can use the "Colors" tab to adapt the color for the display of the Control.

Requirements

- Double-click the inserted control to open the "WinCC Push Button Control Properties" dialog.
- Select the "Colors" tab.



Property Name

From the drop-down list box, select the color attribute that you wish to change. The "OLE Automation Name" is displayed. The "OLE Automation Name" is the name under which the attribute is registered in WinCC.

System Color

The drop-down list box contains all the picture elements, the display options of which can be adapted in the operating system control panel.

Select the picture element that has the color you wish to apply. Click the "Apply" button to assign this system color to the color attribute selected in the "Property Name" area.

Basic Color Palette

The right-hand area shows the 16 standard colors of the operating system as buttons.

Select one of the 16 standard colors. Click the "Apply" button to assign this system color to the color attribute selected in the "Property Name" area.

See also

The "WinCC Push Button" Control (Page 131)

How to Assign Pictures to the Push Button (Page 135)

How to Change the Font of the Push Button (Page 134)

How to Change the Appearance and Labeling of the Push Button (Page 132)

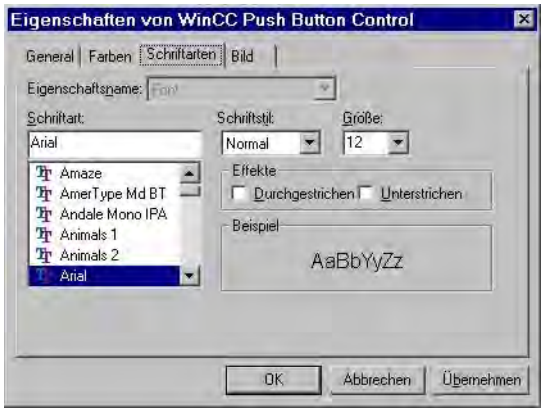
3.7.2.4 How to Change the Font of the Push Button

Introduction

Use the "Fonts" tab to adapt the label on the Push Button.

Requirements

- Double-click the inserted control to open the "WinCC Push Button Control Properties" dialog.
- Select the "Font" tab.



Property Name

The currently selected property is shown.

Font

Select the required font for the control label. You can use any of the fonts registered in the operating system.

Font Style

Select the required font style from the drop-down list box. The number of available font styles depends on the font selected.

Size

Select the required font size from the drop-down list box. Alternatively, enter the font size directly in the field. The value is specified in points (pt).

Effects

Select one or more effects. The selected font can be displayed as "Underline" and "Strikethrough".

Example:

The selected settings are displayed in a preview.

See also

The "WinCC Push Button" Control (Page 131)

How to Assign Pictures to the Push Button (Page 135)

How to Change the Color of the Push Button (Page 133)

How to Change the Appearance and Labeling of the Push Button (Page 132)

3.7.2.5 How to Assign Pictures to the Push Button

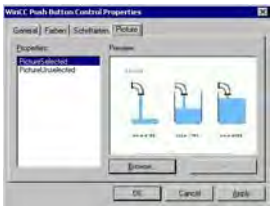
Introduction

You can use the "Picture" tab to assign pictures for the statuses "Pressed" and "Not pressed" to the Push Button.

Requirements

- Double-click the inserted control to open the "WinCC Push Button Control Properties" dialog.
- Select the "Picture" tab.

Changing Configuration



Properties

Select the property for which you want to change the picture assignment. The current picture is shown in the "Preview" area.

In Runtime, the Push Button can be in statuses of "Pressed" or "Not pressed". The image, which is assigned to the property "PictureSelected", is displayed only if you click the button. As long as the Push Button is not pressed in Runtime, it shows the image that is assigned to the property "PictureUnselected".

Browsing

Click the "Browse..." button to access the "Find Picture" dialog. Select the graphic file, to which you want to assign the selected property.

Pictures in the following formats can be inserted:
BMP, DIB, ICO, CUR, EMF, WMF, GIF and JPG.

Deleting

Click the "Clear" button to move on from the opening picture.

See also

The "WinCC Push Button" Control (Page 131)

How to Change the Font of the Push Button (Page 134)

How to Change the Color of the Push Button (Page 133)

How to Change the Appearance and Labeling of the Push Button (Page 132)

WinCC diagnosis 4

4 Resources

4.1 Runtime Monitoring of Actions

Introduction

WinCC script processing is a very open system. It allows Windows APIs and dedicated DLL functions to be called. The underlying programming language C is very comprehensive and offers a high degree of freedom. Incorrect implementation of these capabilities can also lead to crashing the system. Incorrect configuration can also seriously decrease the performance of the system.

The ApDiag.exe diagnostics tool should be used to support the analysis of errors and performance problems. Note that the diagnostics application itself will affect performance; collecting additional values costs time. Individual diagnostic functions can therefore be activated and deactivated to avoid degrading the runtime of the system during operation.

This is why you should ensure that the diagnostic functions are deactivated during the final commissioning stage.

This description will not explain every possible item of diagnostic information in detail, since certain parts require a well-grounded knowledge of the system architecture for this. The purpose of this description is to indicate possibilities and handling of the ApDiag diagnostics tool so that ApDiag can be utilized as intended should the need arise.

4.2 Starting ApDiag.exe

Start ApDiag

Apdiag.exe is located in the installation directory in folder "...\Siemens\WinCC\Utools".

As soon as WinCC is opened, you can start the application as usual (double click). It is irrelevant whether runtime is activated or not. If no project has been opened, a link to the action controller can be created.

ApDiag is ended when changing projects and when closing WinCC.

To permanently display diagnostics information, independent of operation and navigation in the system, ApDiag is in the foreground. Set your window position and size so that ApDiag

disturbs as little as possible. These settings are saved and reestablished again during the next startup.

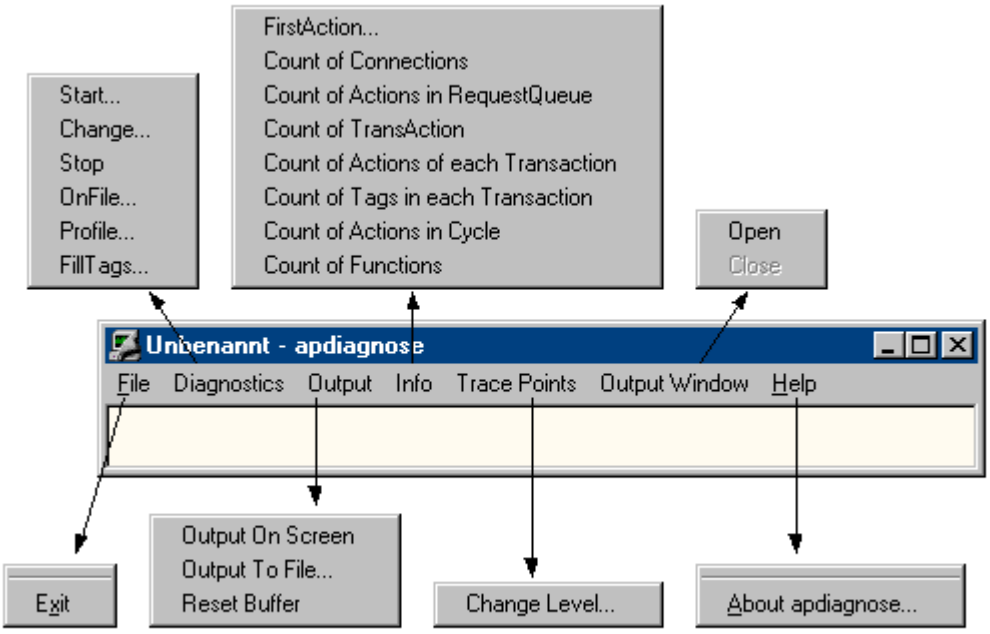
4.3 ApDiag Menu Commands

4.3.1 Menu Bar Overview

Overview

ApDiag operation is described in the following chapters.

The menu bar is constructed as follows:



In the online help, you can click on a menu command with the mouse and display the respective description.

Diagnostics

Menu "Diagnostics" offers several types of diagnostics information.

Using "Start", "Change" and "Stop", the recording of diagnostic information (tracing) can be controlled.

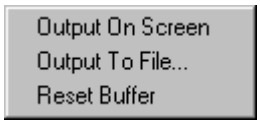
Menu command "OnFile" can be used for defining the output source for the individual types of diagnostics information.

The runtime of actions can be measured and queue growth can be monitored with command "Profile".

Using command "FillTags", saving important diagnostics information in internal tags is activated and deactivated.

Output

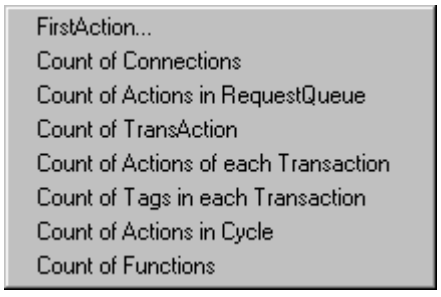
Using menu "Output", trace entries generated with diagnostics can be output to a window, stored in a file or deleted.



The trace entries are also collected in a circulating buffer when the window is not shown.

Info

Menu "Info" delivers current information on the system.

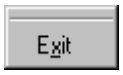


The diagnostic information is output one time when selected (not automatically). The output is done as trace (Level1) and as printf.

4.3.2 File - Exit

Description

Use command "Exit" to end ApDiag.

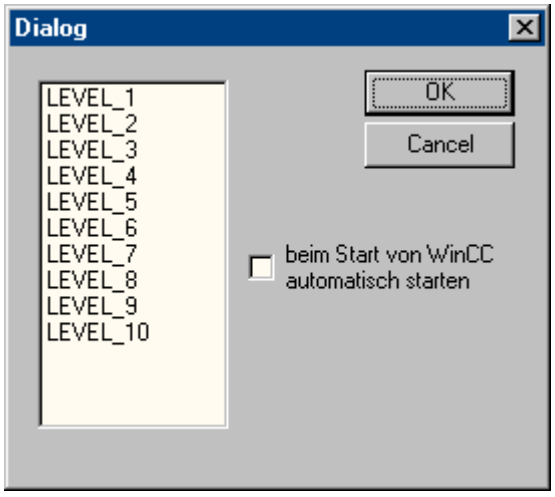


4.3.3 Diagnostics

4.3.3.1 Start

Description

Use menu command "Start" to open a dialog, in which a diagnostics level can be selected. Select the "OK" button to start the diagnosis and write the trace point in the defined level.



The higher the level, the more frequent and less serious the trace points are.

In level 1, only faults are output, as of level 3, printf (OnErrorExecute) are output as well. Levels 9 and 10 are mainly for testing for whether the script.exe application reacts.

In chapter "Trace points and their diagnostics level), a selection of trace points is described.

The diagnosis is different from the "printf information" in that the entries are collected with the window closed as well and mainly system messages (trace points) are shown.

Other trace entries can also be created using internal functions TraceTime() and TraceText(). The functions are described in the WinCC Help.

The trace entries are output in the diagnostics window as standard.

Note
End ApDiag

The diagnosis is switched off when changing projects and when ending ApDiag.

The option "Start automatically at WinCC start" offers the ability to start the diagnosis in the defined level automatically, each time a project is opened.

Since writing the trace points influences the performance, trace should really be switched off for normal operation.

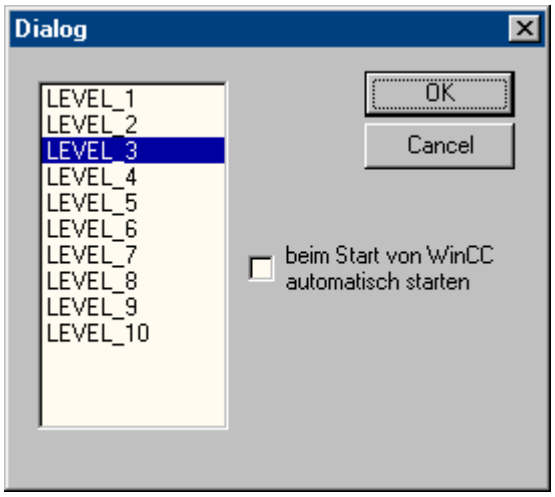
Note
End ApDiag

This setting is also retained after ending ApDiag.exe and after restarting the computer.

4.3.3.2 Change

Description

With menu command "Change", you can recognize whether a trace is switched on and change the current diagnostics level if required:



The current diagnostics level is marked. Select another level and click on "OK" to change the level.

Note

If no diagnosis is started, selecting "Change" opens no dialog.

4.3.3.3 Stop

Description

Writing trace points is ended with menu command "Stop". Since writing the trace points influences the performance, trace should really be switched off for normal operation.

Note

End ApDiag

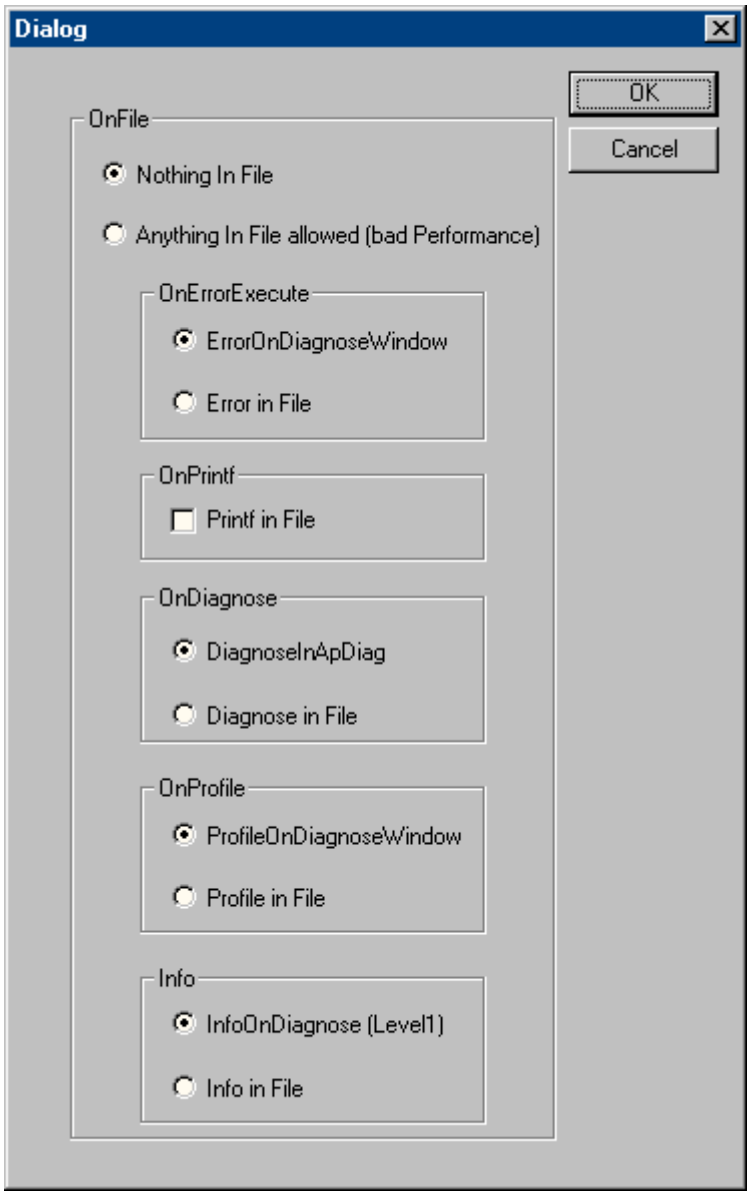
When ending ApDiag or when changing a project, the trace is ended.

4.3.3.4 OnFile

Description

Dialog "OnFile" can be used to convert diagnostics information (e.g. OnErrorExecute, printf) into a text file. All settings are stored in the registry and are retained after a restart as well.

Since converting the diagnostics information influences the performance and the settings made here are retained after restarting WinCC or the computer, you can use option "NothingInFile" to centrally stop writing the diagnostics information to a file.



Nothing In File

This option can be used to centrally centrally suppress the conversion of diagnostics information to a file.

Anything In File

Use this option to centrally activate the conversion of diagnostics information. The information that is actually concerned, depends on the settings under "In File".

OnErrorExecute

This parameter can be used to define whether the output of an OnErrorExecute (standard function of WinCC, which is called by the system in case of an error) to a file or in the output window. An OnErrorExecute is lost when the diagnostics window is not shown, another error analysis is enabled with the output to a file, even afterward.

The following applies for the output to a file: The file is called OnErrorN.txt and is located in the installation directory:

- ..\Siemens\WinCC\Diagnose

A certain number of entries is written to a file. Then the next file is begun. It is always started with OnError0. After file OnError10, it begins with OnError0 again. After activating the project, it starts with OnError0 again the first time the function is called. The size of the files can be influenced by modifying the limit value for tag "dwErrorCount" of this WinCC standard function in the C editor for the Global Script.

OnPrintf

This parameter can be used for setting whether the outputs created by printf() are made to a file or to the output window.

The following applies for the output to a file: The file is called OnprintfX.txt and is located in the installation directory:

- ..\Siemens\WinCC\Diagnose

Particular attention is paid to the file size. 64 KB is written to a file and then the next file is begun. It is always started with Onprintf0. After file Onprintf10, it begins with Onprintf 0 again. After activation, it is also started with Onprintf 0 the first time the function is called.

OnDiagnose

When the diagnosis is switched on, all trace information for the respective level can be routed to a file.

The following applies for the output to a file: The file is called OnDiagnoseX.txt and is located in the installation directory:

- ..\Siemens\WinCC\Diagnose

Particular attention is paid to the file size. 64 KB is written to a file and then the next file is begun. It is always started with OnDiagnose0. After file OnDiagnose10, it begins with OnDiagnose0 again. After activation, it is also started with OnDiagnose0 the first time the function is called.

OnProfile

This parameter is used for defining whether the diagnostics information delivered with OnProfile will be output in a file or the application window.

The following applies for the output to a file: The file is called OnDiagnoseX.txt and is located in the installation directory:

- ..\Siemens\WinCC\Diagnose

Particular attention is paid to the file size. 64 KB is written to a file and then the next file is begun. It is always started with OnDiagnose0. After file OnDiagnose10, it begins with OnDiagnose0 again. After activation, it is also started with OnDiagnose0 the first time the function is called.

OnInfo

This parameter defines whether the information output via the menu Info should be output to a file.

The following applies for the output to a file: The file is called OnInfoX.txt and is located in the installation directory:

- ..\Siemens\WinCC\Diagnose

Particular attention is paid to the file size. 64 KB is written to a file and then the next file is begun. It is always started with OnInfo0. After file OnInfo10, it begins with OnInfo0 again. After activation, it is also started with OnInfo0 the first time the function is called.

4.3.3.5 Profile

Description

As of 10000 queued actions, by default, the system outputs message: "ActionOverflow:more than 10000 Actions to work" to diagnostics file WinCC_Sys_01.log.

With this entry, determining the cause for an increase or overflow of the queue can only be done with difficulty.

Menu command "Profile" now offers diagnostics information that enables the early detection of growth or an overflow of the queue. Time measurements can be activated for actions and an growth in the queue (ActionQueue) can be checked.

General Information on Queue Overflow

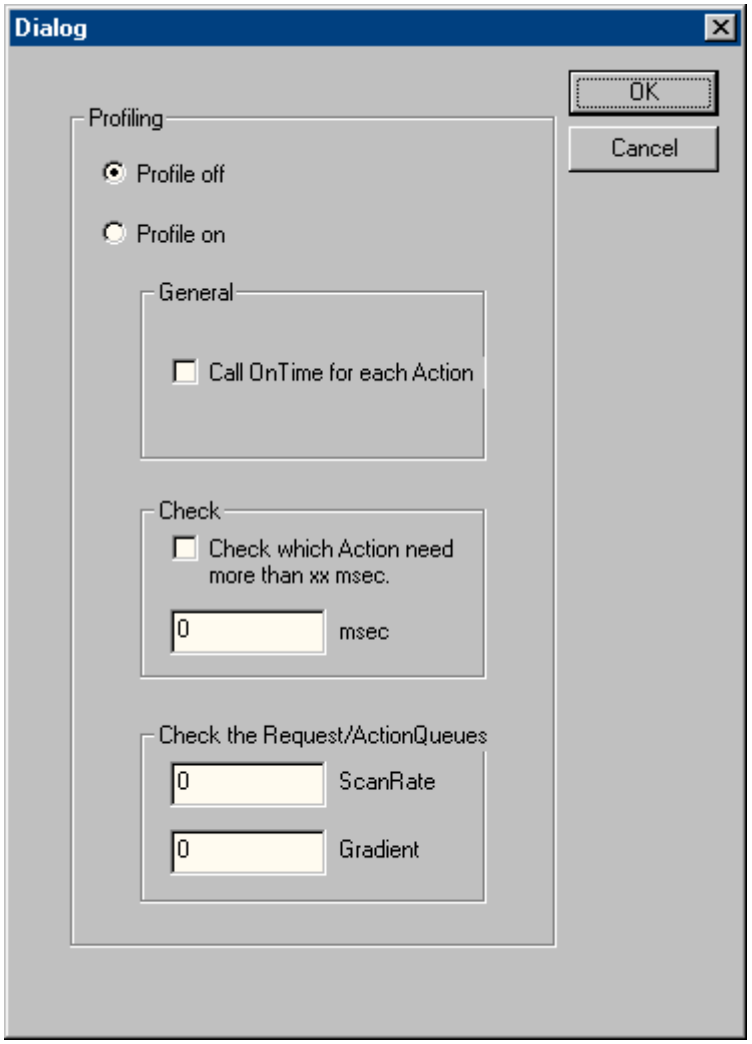
A queue overflows if too many actions are running in a cycle that is too small (gradually, the actions to be processed will build up) or an action freezes (e.g. sleep, loop, dialog output, waiting for a response from another application). All the other actions are then blocked in the queue and cannot be processed.

This can be regained to a certain extend but with 10000 entries in the queue, this is no longer possible.

Decreasing the Load

Since performance measurements themselves will cause extra load and any settings made in this context are retained after restarting WinCC or the computer, a superordinate switch has

been integrated, which allows a quick overview to prevent any diagnostics measurements from remaining switched on.



Profile off

This option is superordinate and can be used to switch measurements off.

Profile on

This option is superordinate and can be used to switch measurements on. It is absolutely necessary to switch the switch and the desired information on to activate a measurement.

General

If option "Call On Time for each Action" is activated, a time measurement is performed for every action that is executed and is output with standard function "On Time".

Example

```
====================================OnTime====================================
dwCode:                    (ThreadId 327)   113
szTimeText:          (ThreadId 327)   PROFILE_EACH_ACTION
dblTime:             (ThreadId 327)   358.744
szApplicationName:   (ThreadId 327)   PDLRuntimeSystem
bCycle:              (ThreadId 327)   acycle
szFunctionName:      (ThreadId 327)   @51
lpszPictureName:     (ThreadId 327)   STARTBILD.BILDFENSTER1:AKTIONSTESTBILD3
lpszObjectName:      (ThreadId 327)   Button17
lpszPropertyName:          (ThreadId 327)   (NULL)
dwParamSize:         (ThreadId 327)   12
====================================OnTime====================================
```

Check

If checkbox "Check wich Action need more than xx msec" is activated, the runtime for all actions that run longer than the defined time is output. This allows limiting the number of outputs and less load is created by the measurement itself (the function OnTime will not continue to cycle).

Example

```
====================================OnTime====================================
dwCode:                    (ThreadId 492)   114
szTimeText:          (ThreadId 492)   PROFILE_FOR_XX_TIME
too long             (ThreadId 492)
dblTime:             (ThreadId 492)   4326.03
szApplicationName:   (ThreadId 492)   PDLRuntimeSystem
bCycle:              (ThreadId 492)   cycle
szFunctionName:      (ThreadId 492)   @55
lpszPictureName:     (ThreadId 492)   STARTBILD.BILDFENSTER1:AKTIONSTESTBILD
lpszObjectName:      (ThreadId 492)   EAFeld1
lpszPropertyName:          (ThreadId 492)   Visible
dwParamSize:         (ThreadId 492)   12
====================================OnTime====================================
```

Check the Request/ActionQueues

This parameter allows recognition of slow growth in the queue, which would only lead to error message "more than 10000 Actions to Work" after several hours or days. Individual pictures can also be checked for correct action programming.

Value "ScanRate" can be used to define after which amount of new jobs that the length of the queue should be checked. If the queue has grown by more than the value defined with Gradient, a notice in the form of a printf is output.

If you enter e.g. with ScanRate "100" and Gradient "30", then after 100 new entries (actions) have been placed in the queue, a check is performed to determine whether the queue has grown by more than 30 entries (less than 70 processed from the 100 new jobs). If this is the case, the following diagnostics information is output in the form of a printf().

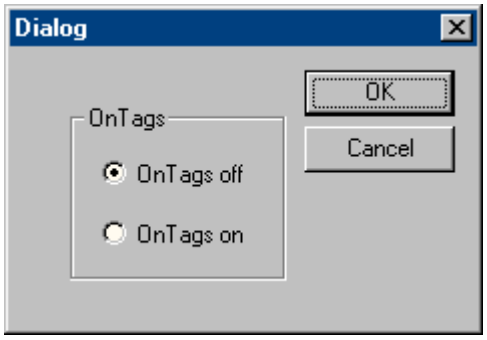
Example

The ActionCount grows too fastly: ScanRate: 100 projectGradient: 30 actualGradient: 87

4.3.3.6 FillTags

Description

Using menu command "FillTags", saving important diagnostics values in tags can be switched on.



The diagnostics tags are created during the creation of a WinCC project and can be used as usual. Switching on and off is also possible with internal function FillDiagnoseInTags(). This function is described in the WinCC Help.

Note that writing the diagnostics values created more basic load. The runtime for each started action is lengthened since the diagnostics values also have to be written in the tags. This functionality should therefore be switched on for a short time only.

WinCC Diagnostics tags

@SCRIPT_COUNT_TAGS	This tag contains the current number of tags requested via Script.
@SCRIPT_COUNT_REQUEST_IN_QUEUES	This tag contains the current number of jobs.
@SCRIPT_COUNT_ACTIONS_IN_QUEUES	This tag contains the current number of actions that exist for processing.

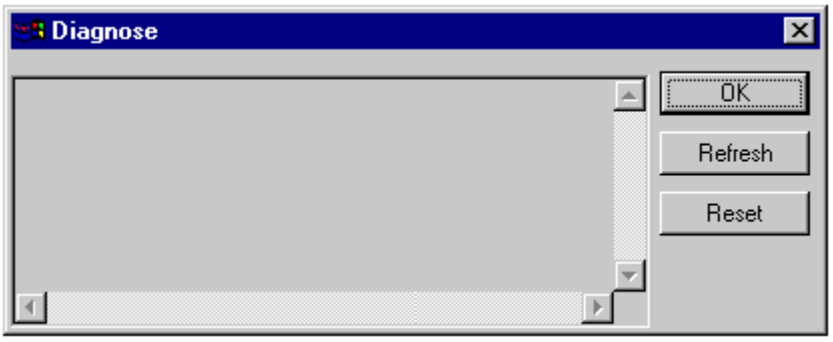
4.3.4 Output

4.3.4.1 Output On Screen

Description

Use menu command "Output On Screen" to open the diagnostics window.

The previously collected trace entries are output here. Unlike Output Window, the diagnostics window is only updated when opening and with the "Refresh" button. The contents are only deleted if Reset is actuated or the diagnostics buffer has been written full.



Note

Sequence in the Diagnostics Buffer

The diagnostics buffer is a circulating buffer. The lowest entry is therefore not necessarily the oldest entry.

4.3.4.2 Output To File

Description

Menu command "Output To File" can be used one time to put the previously collected trace entries into a text file.

4.3.4.3 Reset Buffer

Description

Use menu command "Reset Buffer" to delete the previously collected trace entries.

This functionality corresponds with the "Reset" button in the diagnostics window.

4.3.5 Info

4.3.5.1 FirstAction

Description

Menu command "FirstAction" delivers information on the action that is running and therefore provides the ability to recognize which action in the queue is in the first position and e.g. blocks the processing of other actions with a loop.

Similar to OnErrorExecute, the actions that are currently being processed are put in a text file. In addition, the stack for these actions is output so that it is possible to recognize whether the action e.g. is frozen in DLL calls.

The information on the currently processed action is also output again as OnErrorExecute.

Note

If no action is blocking the processing, no text file will be created and no OnErrorExecute will be output.

Example

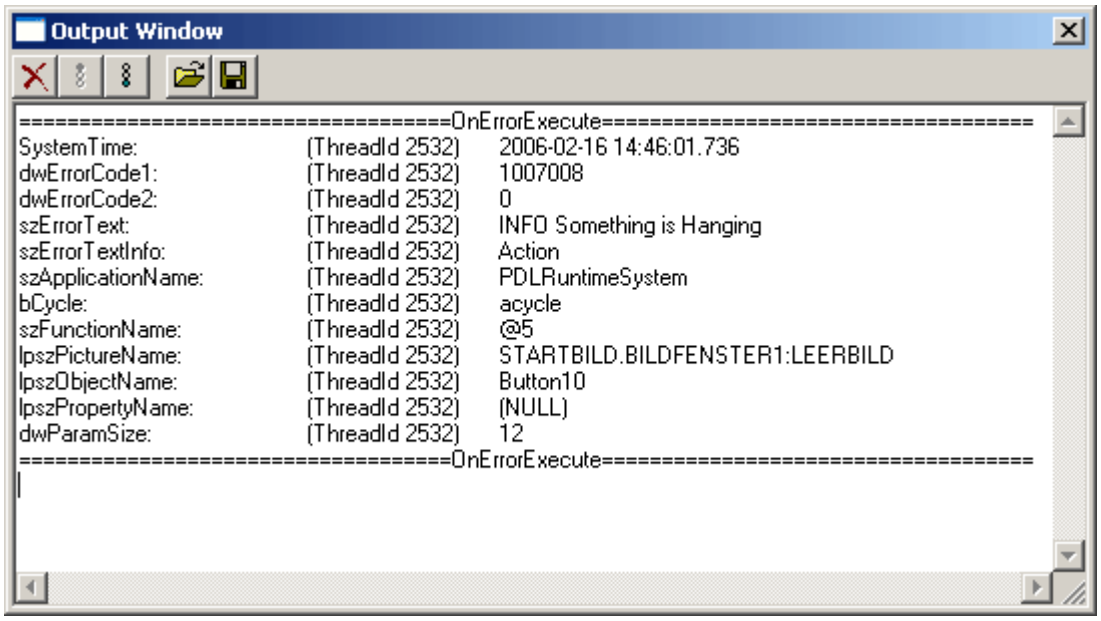
A "blocking" action can be simulated by function MessageBox(NULL,"Welt","Hallo",MB_OK);.

The action which calls the error box is not resumed until the box has been closed. This is comparable to a Message Box with a loop or a Sleep().

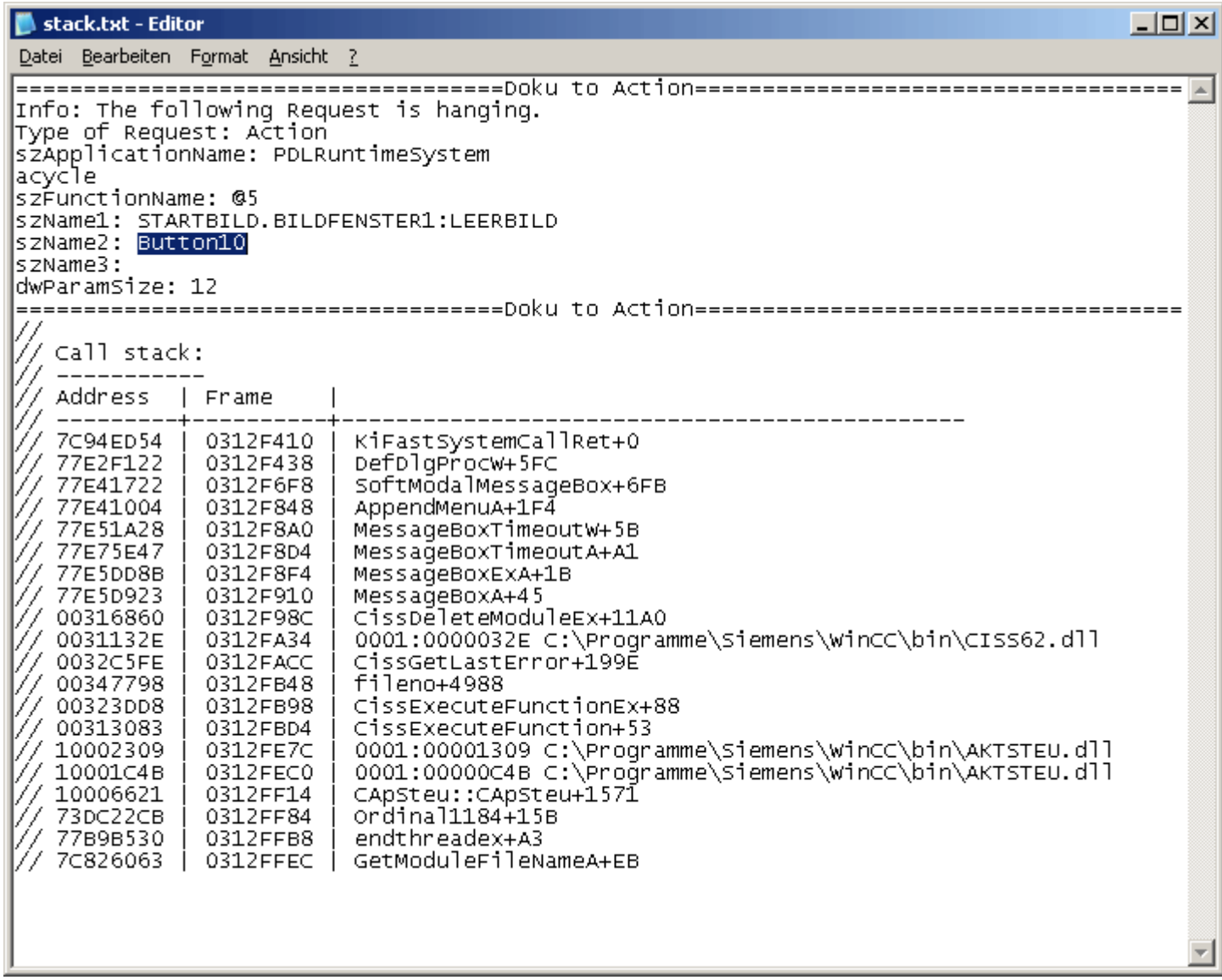
To check whether an action is blocking processing:

1. Start ...Siemens\WinCC\uTools\Apdiag.exe.
2. Select "Info > FirstAction".
3. Enter the name of a text file in dialog "Save as".

The following information is then put in the text file:



And the following OnErrorExecute is output:



4.3.5.2 Count of Connections

Description

The menu command "Count of Connections" lists all applications that have established a connection to the action control.

Example

==========

1.Applikation: GSC_RT

2.Applikation: ITLG-RT

3.Applikation: PDLRuntimeSystem

4.Applikation: APDiagnose

==========

4.3.5.3 Count of Actions in RequestQueue

Description

Menu command "Count of Actions in RequestQueue" outputs the current number of actions that are queued for processing.

There are jobs from Global Script, cycle jobs from pictures and event-controlled jobs from pictures.

Example

==========

Applikation: GSC_RT cycle Count of Requests 0

Applikation: PDLRuntimeSystem cycle Count of Requests 0

Applikation: PDLRuntimeSystem acycle Count of Requests 1

==========

4.3.5.4 Count of TransAction

Description

Menu command "Count of TransAction" lists the current number of transactions for every application that is logged in.

One transaction is established e.g. for every event-controlled action, for every picture window, which contains at least one cyclic action, and for global scripts.

Example

==========

1.Applikation: GSC_RT Count of Transactions 1

2.Applikation: ITLG-RT Count of Transactions 0

3.Applikation: PDLRuntimeSystem Count of Transactions 7

4.Applikation: APDiagnose Count of Transactions 0

==========

4.3.5.5 Count of Actions of each Transaction

Description

Menu command "Count of Actions of each Transaction" lists the number of actions contained in the transactions.

The output is in the following form:

- Name of the Application
- Number of the Transaction
- Number of Actions

At the end of the list, the total sum of actions is output.

Example

```
============================================================
Info to Transaktions: Count of Action in Transaction
1.Applikation: GSC_RT Count of Actions in TransAction(0): 15
3.Applikation: PDLRuntimeSystem Count of Actions in TransAction(7): 1
3.Applikation: PDLRuntimeSystem Count of Actions in TransAction(6): 1
3.Applikation: PDLRuntimeSystem Count of Actions in TransAction(5): 1
3.Applikation: PDLRuntimeSystem Count of Actions in TransAction(3): 1
3.Applikation: PDLRuntimeSystem Count of Actions in TransAction(2): 1
3.Applikation: PDLRuntimeSystem Count of Actions in TransAction(0): 19
3.Applikation: PDLRuntimeSystem Count of Actions in TransAction(1): 1
Info to Transaktions: Count of Action in Transaction 40
============================================================
```

4.3.5.6 Count of Tags in each Transaction

Description

Menu command "Count of Tags in each Transaction" lists the number of tags requested in the transactions.

The output is in the following form:

- Name of the Application
- Number of the Transaction
- Cycle time, with which the tags use for logging in
- Number of tags

At the end of the list, the total sum of tags requested in transactions is output.

The numerical value defined in Cycle corresponds with the following trigger:

0	Upon change
1	250 ms
2	500 ms
3	1 s
4	2 s
5	5 s
6	10 s
7	1 min
8	5 min
9	10 min
10	1 h
11 - 15	User cycle 1 - 5

Example

```
============================================================
Info to Transaktions: Count of Tags in Transaction
1.Applikation: GSC_RT Count of Tags in TransAction(0) in Cycle 0: 1
1.Applikation: GSC_RT Count of Tags in TransAction(0) in Cycle 4: 6
3.Applikation: PDLRuntimeSystem Count of Tags in TransAction(0) in Cycle 2: 1
Info to Transaktions: Count of Tags in Transaction 8
============================================================
```

4.3.5.7 Count of Actions in Cycle

Description

Menu command "Count of Actions in Cycle" lists the amount of cyclic actions sorted by trigger.

In this case, the numerical values correspond with the following triggers:

0	250 ms
1	500 ms
2	1 s
3	2 s
4	5 s
5	10 s
6	1 min
7	5 min

8	10 min
9	1 h
10 - 14	User cycle 1 - 5

Example

```
============================================================
Count of Actions in Cycle (0): 6
Count of Actions in Cycle (1): 5
Count of Actions in Cycle (2): 0
Count of Actions in Cycle (3): 6
Count of Actions in Cycle (4): 0
Count of Actions in Cycle (5): 1
Count of Actions in Cycle (6): 0
Count of Actions in Cycle (7): 0
Count of Actions in Cycle (8): 0
Count of Actions in Cycle (9): 0
Count of Actions in Cycle (10): 0
Count of Actions in Cycle (11): 0
Count of Actions in Cycle (12): 0
Count of Actions in Cycle (13): 0
Count of Actions in Cycle (14): 0
============================================================
```

4.3.5.8 Count of Functions

Description

Menu command "Count of Functions" provides the number of standard functions and project functions and lists the functions by name.

Example

```
============================================================
Count of Functions 112
FunctionName UTC PathName \\SERVER1\WinCC50_Project_GSLasttest
\library\UTC.Fct
FunctionName WriteNow PathName \\SERVER1\WinCC50_Project_GSLasttest
\library\WriteNow.Fct
```

==========

4.3.6 Trace Points - Change Level

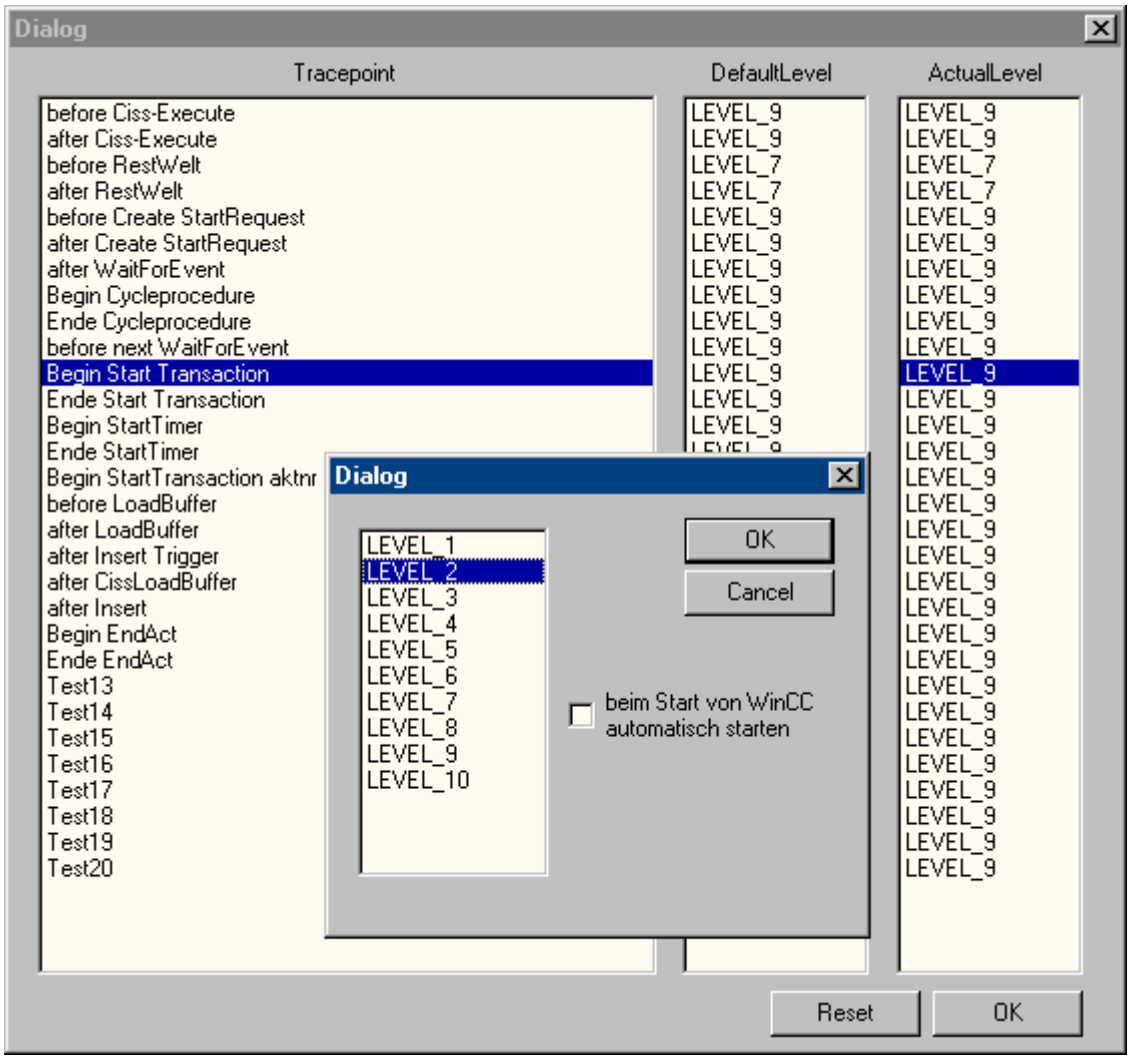
Description

The levels of certain trace points can be changed with this menu command.

If you expect e.g. only one certain trace point, you can set the respective level high and are no longer disrupted by a number of other trace points.

You can change the level by double clicking "Actual Level" for the desired trace point, setting the desired level in the dialog box and leaving the box with "OK".

The original level is set again with a reset.



4.3.7 Output Window - Open / Close

Description

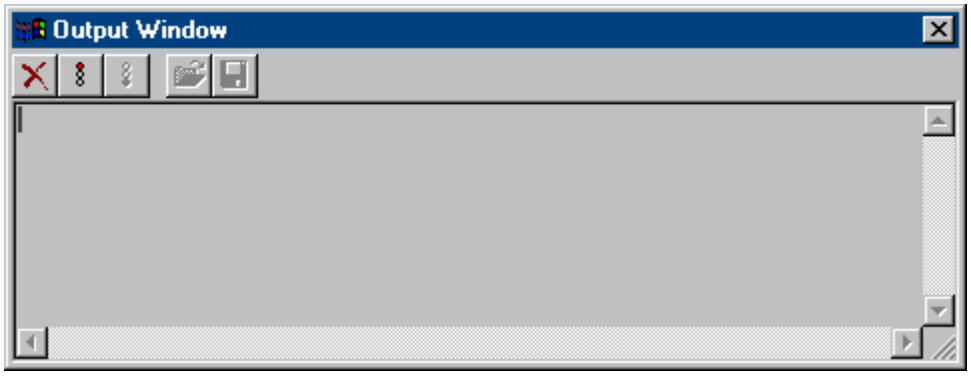
Opens or closes the output window.

The output window corresponds with application window GSC diagnosis, but offers the following advantages:

• It is independent of the configuration. The configuration does not have to be accessed, especially with third-party projects.

• It remains visible with an picture change as well.

• It can be opened even before activating runtime and can therefore show error messages during power up, which remain hidden from the application window GSC diagnosis.



4.4 Appendix

4.4.1 Trace points and their diagnostics level

Introduction

Following is a list of selected trace points.

The trace points indicated with "d" can be changed in the respective level. These are allocated to level 9 by default.

Overview

Trace point	Level	Description
NewRequest nCount	9	With more than 5 jobs, the position is output in the queue for every new job (Request).
more as 10000 Actions to work	9	Overflow, more than 10000 actions in the queue.
before Execute dwID	d	Before executing an action, the action ID is output in hex. If it is a Global Script action, the connection to the action name can be made via the GSC runtime application window. -The same ID is output in OnErrorExecute.

Trace point	Level	Description
Exception in cissexecute dwID	d	If there is an error with an action, the action ID is output in hex. If it is a Global Script action, the connection to the action name can be made via the GSC runtime application window.
after Execute dwID	d	After executing an action, the action ID is output in hex. If it is a Global Script action, the connection to the action name can be made via the GSC runtime application window.
Exception in new Variant dwID	d	Error with return value of an attribute side action.
Ende Execute dwID	d	Action ID processing complete.
Anfang deaktivieren	3	Deactivation initiated.
Ende deaktivieren	3	Deactivation complete.
APDMConnect-Thread said goodbye	1	The thread that prepares the connection between the script control, tag management and other applications was ended unexpectedly.
Begin Start Transaction dwTransID:	d	A new transaction is logged in and the transaction ID output.
no PCode	3	A Global Script action or a function contains no executable code (P-Code). Measures: Compile action or function.
Error in FunctionName	3	Incorrect function name.
Function %s unknown.	3	Unknown function
wrong ReturnTyp	3	Return value type is invalid.
Ende Start Transaction dwTransID:	d	Transaction logged in.
Begin Start TransactionGTI dwTransID:	d	A transaction with cyclic actions or Global Script actions is logged in.
Begin EndAct	d	Transaction logging out initiated.
Begin EndAct dwTransID:	d	Transaction number
Ende EndAct ok	d	Transaction logging out completed.
Begin Compile	6	Compiler process initiated.
projectpath:	6	Compiler: Aplib and Library directory
Ende Compile	6	Compiler process complete.
printf aus Aktionen	3	Printf() outputs
Begin Disconnect dwAppID:	6	An application logs out from the script control.
ChangeFct	6	Function was changed.
LoadFct	6	Reloading a function
DirInfo.szProjectLibDir:	6	Project functions path
DirInfo.szGlobalLibDir:	6	Path of standard functions and internal functions

Trace point	Level	Description
m_szIncludepathProj:	6	Project path for a compiler include
m_szIncludepath:	6	General path for a compiler include
Thread said goodbye	1	A job thread has ended unexpectedly.
Exception in Request	1	An error has occurred in a request.
Timeout Variable ist nicht gekommen	1	Tag request was not answered within 10 seconds.

4.4.2 System messages

Introduction

The following system messages are generated by the script controller and are entered in the Logfiles WinCC_SStart_xx.Log or WinCC_Sys_xx.Log.

Overview

Legend for the "Type" column:

- 1 = Note
- 2 = Warning
- 3 = Fault

Number	Type	Short description in Alarm Logging	Text in diagnosis	Description
1007000	3	Überlauf Overflow Débordement	ActionOverflow: more than 10000 Actions to work	Overflow, more than 10000 actions in the queue.
1007001	3	Aktionsfehler Action-Error Erreur d'action	ExecuteError in Action %s (Functionsname)	An error occurred while processing an action. The Action ID was also output. If it concerns a Global Script action, the connection to the action name can be made via the application window GSC Runtime, as long as the runtime has not been restarted or a Global Script action is saved.
1007001	3	Aktionsfehler Action-Error Erreur d'action	10 errors occurs, no more errors will be reported	One of the above faults has occurred 10 times and will no longer be logged for performance reasons.
1007002	3	Überlauf Overflow Débordement	DM_queue overflow	Overflow of an internal list.

Number	Type	Short description in Alarm Logging	Text in diagnosis	Description
1007003	2	Verbindungsfehler ConnectionError Erreur de liaison	no connection to server %s (Servername)	The connection to the server is broken. Measure: Start server again.
1007004	3	Aktionsfehler 1 Action-Error 1 Erreur d'action 1	Function %s (Functionsname) unknown	Unknown function.
1007004	3	Aktionsfehler 1 Action-Error 1 Erreur d'action 1	10 errors occurs, no more errors will be reported	The above fault has occurred 10 times and will no longer be logged for performance reasons.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	no PCode	A Global Script action or a function contains no executable code (P-Code). Measures: Compile action or function.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	Error in FunctionName	The function name is incorrect.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	wrong ReturnType	The Return value type is invalid.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	Fault in LoadAction	Compiler error when loading the action.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	Fault in OpenFunktion %s (Dateiname der Funktion)	A function could not be loaded.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	Fault in LoadFunktion %s (Dateiname der Funktion) error: %s (Fehlerursache)	A function could not be loaded. Measures: Correct the fault cause indicated in the diagnosis entry.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	Fault in LoadFunktion new_function error: "new_function": doubly defined function	Two *.fct files are using the same function name in the directory "<Project>\Library". Measures: When executing menu command "Regenerate header" in the Global Script, you are notified of the duplicate file name.
1007005	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	10 errors occurs, no more errors will be reported	One of the above faults has occurred 10 times and will no longer be logged for performance reasons.
1007006	3	Variablenfehler VariableError Erreur de variable	Variable %s not exist	Requested tag does not exist.

Number	Type	Short description in Alarm Logging	Text in diagnosis	Description
1007006	3	Variablenfehler VariableError Erreur de variable	Variable %s timeout	Tag request was not answered within a certain amount of time.
1007006	2	Variablenfehler VariableError Erreur de variable	10 errors occurs, no more errors will be reported	One of the above faults has occurred 10 times and will no longer be logged for performance reasons.
1007007	1	Info	FindFirstFile INVALID_HANDLE_VALUE GetLastError() %d	On multi-user projects, the directory .. \Siemens\WinCC\aplib is enabled with the name SCRIPTFCT. If there is no access to the directory, this entry is found and a second attempt is started.
1007007	1	Info	Alles vorbei INVALID_HANDLE_VALUE GetLastError() %d	The second access attempt failed. The SCRIPTFCT directory and the functions and header files contained within are not available. Possible Causes: Network is faulty, no current ServicePack for NT or changed access authorization.
1007007	1	Info	countall %d in szFolder %s	Number of functions in one directory.
1007007	1	Info	before Read Standardfunction	Before reading the standard functions.
1007007	1	Info	runtimeproject %s ok(getprojectdir) %d	Project path definition.
1007007	1	Info	global %s szProjectLibDir %s	The global path and the project path are output.
1007007	1	Info	count StandardFunctions: %d	Number of standard functions.
1007007	1	Info	count StandardFunctions +ProjectFunctions: %d	Number of standard and project functions.
1007007	1	Info	DM_NOTIFY_SHUTDOWN	Request, to end runtime.
1007007	1	Info	RemoveClient	A client has disabled the connection.
1007007	1	Info	InstallClient ok	Communication Client/Server disabled.
1007007	1	Info	InstallClient no ok	A client was not able to establish communication with the server.
1007007	1	Info	no client	Client not logged in.
1007007	1	Info	vor share	Multi-user project: Before enabling directly ..\Siemens\WinCC\aplib.
1007007	1	Info	nach share	Multi-user project: After enabling directly ..\Siemens\WinCC\aplib.
1007007	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	Deactivation : Action was stopped by script	An action was still running 50 s after ending runtime and was deactivated.

Number	Type	Short description in Alarm Logging	Text in diagnosis	Description
1007008	3	Aktionsfehler 2 Action-Error 2 Erreur d'action 2	EndAct Timeout	An action was not able to log out within one minute and was therefore ended. Example: An action with a longer runtime was started and changed to another picture. The action will be ended after one minute.
1007009	3	Fehler im Thread Error in Thread Erreur en Thread	Thread said good-bye	A job thread has ended unexpectedly.
1007009	3	Fehler im Thread Error in Thread Erreur en Thread	APDMConnect-Thread said good-bye	The thread that prepares the connection between the script control, tag management and other applications was ended unexpectedly.

Licensing 5

5 Resources

5.1 Software Has a Value

Usage Authorization

With the purchase of this software, you have acquired the unlimited right to use the software and its functionality. Furthermore, in accordance with our Terms and Conditions, you are entitled to:

- our warranty
- our support
- our service

Our WinCC software is protected against unlawful use. The programs protected in such a manner can run only in a restricted manner when a valid license for the program or the software package has been transferred to the harddisk of the corresponding computer.

For WinCC, licensing represents the usage authorization and thus its real value.

Documentation

This section shows you

- How to Transfer Licenses
- How to Remove Licenses
- how to administer licenses
- how to repair licenses
- what type of licenses exist

See also

Basic license types and license types in WinCC (Page 171)

Software Protection and Licensing (Page 168)

5.2 Software Protection and Licensing

Introduction

SIMATIC WinCC has software protection, just like the rest of SIMATIC software. Each installed software requires a valid license for unrestricted operation. Without a valid license, WinCC software can only be used in Demo mode.

Principle of Licensing

In technical terms, the license is represented by a License Key which the customer receives on a license data carrier upon purchase of the WinCC basic software package. This license key is copied to the hard disk of the computer and enables unlimited use of the software installed from the DVD.

The required license keys and the Automation License Manager program is transferred as part of the WinCC installation. The program manages the license key. A license key can thus be transferred subsequently by the user.

Each license data carrier with valid License Keys for WinCC is supplied with a unique worldwide serial number. This serial number is transferred to the computer while transferring the license key and the same can be read by the Automation License Manager.

Please give this serial number with every inquiry, e.g. in case of a service call.

Note

WinCC versions prior to V6.0 SP3 used the program AuthorsW to manage licenses. The "License Key" was referred to as "Authorization" in these WinCC versions. The respective serial number consisted of a 10-digit numerical sequence.
You have the option to manager authorizations such as license keys of other SIMATIC products with the Automation License Manager.

Copy Protection Procedure

A license key cannot be copied. The copy protection used prevents the copying of License Keys to a license data carrier or hard disk. Encryption technology and alteration of the physical file structure prevent the "functional" copying of a license key for a protected program.

License Key Data Medium

When the WinCC system software is ordered, you will receive a license data carrier along with the software on DVD.

One license data carrier is included for each WinCC option and for the Powerpacks.

Management of License Keys

The Automation License Manager program is also installed during the setup of WinCC and serves to manage license keys for WinCC from Version V6.0 SP3.

During first transmission of a license key, the Automation License Manager creates a directory "AX NF ZZ" on the harddisk. This directory has the attributes "system" and "hidden" and is automatically deleted when the last license key is removed.

CAUTION
Neither the name nor the attributes of the "AX NF ZZ" directory may be changed because the transferred license keys can be irrecoverably lost.

Powerpack

The number of external tags (PowerTags) and archive tags (ArchivTags) permissible for a WinCC software configuration - within a version - can be upgraded with a Powerpack.

- For the Powerpack of the PowerTags, there is the "WinCC RT (xxx) Powerpack" and "WinCC RC (xxx) Powerpack" package. If the permissible number of PowerTags is exceeded in Runtime, WinCC switches to demo mode. The number of PowerTags will not be checked on a client.
  If configured without RC license, WinCC runs in demo mode. In this case, the you can use the editors until the demo mode period elapses.
- Upgrade license for ArchiveTags
  A license to use 512 ArchiveTags is included in the RT and RC licenses. If you wish to use more than 512 ArchivTags in RT, you must upgrade the system.

Note

The Powerpack is only used for the Upgrade procedure and cannot be used to operate the WinCC software.

You can only upgrade the system once with the License Key held on the license data carrier.

RT and RC Licensing

WinCC differentiates between RT licenses (Runtime) and RC licenses (Runtime and Configuration). Another distinction is based on the number of tags.

- RT licenses permit the operation of WinCC in Runtime mode for an unlimited period of time. The editors may only be used in demo mode for a limited period of time.
- RC licenses permit the operation of WinCC in Runtime mode and in project configuration mode for an unlimited period of time.
- The description of the "WinCC RT (xxx)" or "WinCC RC (xxx)" license specifies how many external tags and archive tags are permitted for the configuration.
  Example: "WinCC RC (65536)"
  With this license, you can use up to 64*1024 PowerTags (PTg) and up to 512 ArchiveTags (ATg) in RT.
  The system goes into demo mode if you activate a project where the number of external tags or archive tags exceeds the number of permitted tags. In this case the system behaves as if there was no license at all.

Note

On a client, the maximum number of PowerTags (256*1024) and ArchivTags is always permitted with an existing RT/RC license since the number of tags is only checked on a server.

Archive licenses

Archive licenses can be cumulated from WinCC V6.2 onwards. If there are two or more single archive licenses locally on a computer, then the permissible volume for RT is the sum of the individual archive licenses. You need the Automation License Manager Version V3.0 or higher to cumulate the archive licenses.

Example:
Archive license (5000 Tags) + Archive License (1500 Tags) --> Archive license (6500 Tags)

Archive licenses basically belong to "Floating License" type; however, they always need to be transferred locally to the computer.

Note

For the Archives license count, the following applies as of WinCC V6.0 SP3:

- The tags for the process value archive are counted individually. A check of the tag numbers is performed in Runtime.

- The tags for the compressed archive are no longer included in the license count.

- A license is only required for Runtime for user archives.

Remote use of licenses

You can also remotely use RC licenses.

If a RC license is remotely located on another computer, then it can only be used in CS. To use RT, you also need a RT license locally.

Missing Option Licenses

If you configure data for an option or a channel DLL, the system can be used in an unrestricted manner only if all license keys have been transferred. Missing license keys for an option used or a channel DLL causes WinCC to switch to demo mode, regardless of whether or not other license keys are available.

See also

System Requirements (Page 175)

Transferring licenses (Page 176)

5.3 Basic license types and license types in WinCC

Introduction

From WinCC V6.0 SP3, software licenses for WinCC and other SIMATIC products are managed using the Automation License Manager.

The Automation License Manager assigns each software license a 20-digit serial number. If it displays only 10-digit serial number, the software license represents a version prior to WinCC V6.0 SP3.

All software licenses acquired with older WinCC versions can no longer be used with WinCC V6.2 and above. You must upgrade the licenses so that you can work with these licenses on WinCC V6.2 and higher. This distinguishes between the following cases:

- License upgrade from WinCC V5.x --> WinCC V6.2
- License upgrade from WinCC V6.x --> WinCC V6.2

License Keys are assigned to different basic license types and license types.

Overview

The License Keys and the authorizations prior to V6.0 SP3 were displayed in the "Management" view in the Automation License Manager. The column display depends on the selected view.

Status	Family	Product	Version	Standard license type	License type	Number of license keys	Validity
—	SIMATIC HMI	WinCC Ind.DataBridge (10000)	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC NET	Industrial Ethernet SOFTNET-S7 Lean	6.4	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC Chipcard	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC Load Balancing	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC S5 Ethernet TF	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC Archive	6.2	Floating	Count relevant	1	120000
—	SIMATIC HMI	WinCC S5 Ethernet Layer4	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC TI Ethernet Layer4	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC Connectivity Pack	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	StoragePlus	1.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC Connectivity Station	6.2	Single	Unlimited	1	Unlimited
—	SIMATIC HMI	WinCC Profibus FMS	6.2	Single	Unlimited	1	Unlimited

Additional information on the meaning of individual columns may be found in the online help of the Automation License Manager program.

Basic license types and license types

Differentiation is made between the following basic license types and license types. The software behaves differently for different types.

Note

Read the current information on the licenses in the Release Notes.

Basic license types	Description
Single License	Standard license with time restrictions; it can be transferred to any computer and used there. The type of use is determined from the Certificate of License (CoL). Single Licenses can only be used locally. Single License is marked as "SISL" and can be upgraded.
Floating License	Standard license with no time restrictions; it can be transferred to any computer and used there. The license can also be read from a license server over the network. The license size cannot be chosen however. The first free license on the license server is assigned. You must therefore ensure that sufficient floating licenses are available on the license server. Otherwise, the requesting computer is switched to demo mode. If a RC license is present locally and remotely then WinCC always uses the local license. Please refer the Installation Notes of WinCC/Central Archive Server Information System for more information about archive licenses for CAS. You must also note the following if you acquire the floating license via the network: • the Automation License Manager must be installed on the license server • The license is only usable for configuration (CS) • For Runtime, a RT license must be installed on the local computer • After disconnection, the program is restarted only after 3 hours in demo mode The floating license is labeled with "SIFL" and can be upgraded.
Upgrade License	A specific system status can be changed using this license, e.g.: • update to a newer version of the program • extension of quantity structure The Upgrade License is labeled as "SIUP" or "SIPP".

License Types	Description
Count Relevant License	With this license, software utilization is limited as follows: • the number of operating hours stated in the contract Please refer the Installation Notes of WinCC/Central Archive Server Information System for more information about archive licenses for CAS. The Count Relevant License is labelled as "SIFC".
Rental License	With this license, software utilization is limited as follows: • the number of operating hours stated in the contract • the number of days from the day of first use stated in the contract • the period until the expiry date stated in the contract • Use only on a local PC. The rental license is labeled with "SIRL".

See also

WinCC in the Demo Mode (Page 174)

How to Restore a License Key (Page 184)

5.4 WinCC in the Demo Mode

Introduction

A missing license causes WinCC to run in demo mode. This mode permits the operation of WinCC for testing and presentation purposes or for configuration modifications on site if only an RT license is available.

- During installation of WinCC, a message informs the user that WinCC may only be operated in demo mode without licensing.
- After one hour, the configuration software is terminated for lack of license RCxxx. You are permitted to save changes before the software terminates. The WinCC Explorer continues to run in runtime and only the editors are closed. If an editor is started again, you are only permitted to work for an additional 10 minutes.
- Upon the start of Runtime, a box appears requesting acknowledgment and acquisition of a valid license (lack of license RTxxx). This message is redisplayed every 10 minutes and must be acknowledged. If the message window is moved, the window reappears again, centered, after 30 minutes at the most. As long as you are in Runtime, WinCC Explorer is not terminated. On exiting from runtime, WinCC Explorer is also closed.

When you subsequently transfer a license in the demo mode, it is effective only when you restart WinCC.

Note

Even without a license, operational processing is fully functional without loss of data for archiving or message system.

5.5 Error Avoidance

Introduction

You must remove all license keys and authorizations before using a disk optimization program that moves fixed blocks. This also applies to formatting, compressing, or restoring the hard disk or to installing a new operating system on your computer.

It is not possible to use compressed hard disks or disk drives.

If a backup contains copies of the license keys and authorizations, you run the risk of the existing valid license keys and authorizatons will be overwritten and thus destroyed when you restore the backup files on the harddisk.

If you lose a license key, it is possible to restore it again. Additional information may be found under "How to Restore a License Key".

CAUTION
You may not change the directory "AX NF ZZ" or its contents! While transferring a WinCC license to the harddisk, a cluster is marked as "defective". Do NOT attempt to restore it!

Hence you must remove the license keys before each backup or exclude them from the backup.

See also

How to Restore a License Key (Page 184)

5.6 Management of Licenses

5.6.1 Management of Licenses

Introduction

The licenses for WinCC and other SIMATIC products are managed using the Automation License Manager.

The Automation License Manager uses the term "License Key" for licenses of WinCC and other SIMATIC products. The term "Authorization" refers to a license of WinCC prior to V6.0 SP3.

5.6.2 System Requirements

Introduction

WinCC licenses or the license keys of other SIMATIC software can only be transferred using lUSB memory sticks or uncompressed hard disk drives. You cannot transfer licenses to RAM drives, DOS diskettes or compressed harddisk drives.

Exception: In case of compressed drives you can transfer the license to the corresponding host drive.

The minimum amount of required space is 20 MB. You can transfer as many licenses as you want if there is enough memory on the harddisk.

CAUTION
A write operation to the license data carrier is performed each time when you transfer or remove a WinCC license.

Requirements for the Automation License Manager

Hardware

The hardware requirements for using the Automation License Manager are:

- Computer (Industrial computer, programming device, etc.) with
- Working memory >= 128 MByte
- Free hard disk space > 20 MByte

Software

The Automation License Manager is a 32-bit Windows program and runs under the following operating systems:

- Microsoft Windows 2000 SP4
- Microsoft Windows 2000 Server SP4a
- Microsoft Windows XP Professional SP1, SP1a or SP2
- Microsoft Windows Server 2003 Standard Edition or 2003 SP1

The software runs on all language versions for the supported operating systems.

Note

If you install the Automation License Manager as license server without WinCC, then you also need to customize the firewall settings. At least File and Printer Release must be enabled in the firewall.

Proceed as follows if you are using Windows Firewall:

Open Settings in the Control Panel in the Windows Start menu. Open the Windows Firewall dialog.

Enable the File and Printer Release option in the Exceptions tab.

See also

How to Remove Licenses (Page 180)

Transferring licenses (Page 176)

5.6.3 Transferring licenses

Introduction

Transferring a WinCC license means activating it on a local drive and deactivating it on the license data carrier so that WinCC can use the license.

There are two ways of transferring your WinCC license:

- Automatically during installation of the WinCC software. The setup program guides you through the installation. We recommend that you perform the installation in this manner.
- Manually using the Automation License Manager administration program at a later date.

Note

If several licenses are present, WinCC uses the license found first. In many cases, this license is not the most powerful license. Hence you need to ensure that only one and not many licenses are transferred.

See also

Error Avoidance (Page 174)

System Requirements (Page 175)

How to transfer licenses via WinCC Setup (Page 177)

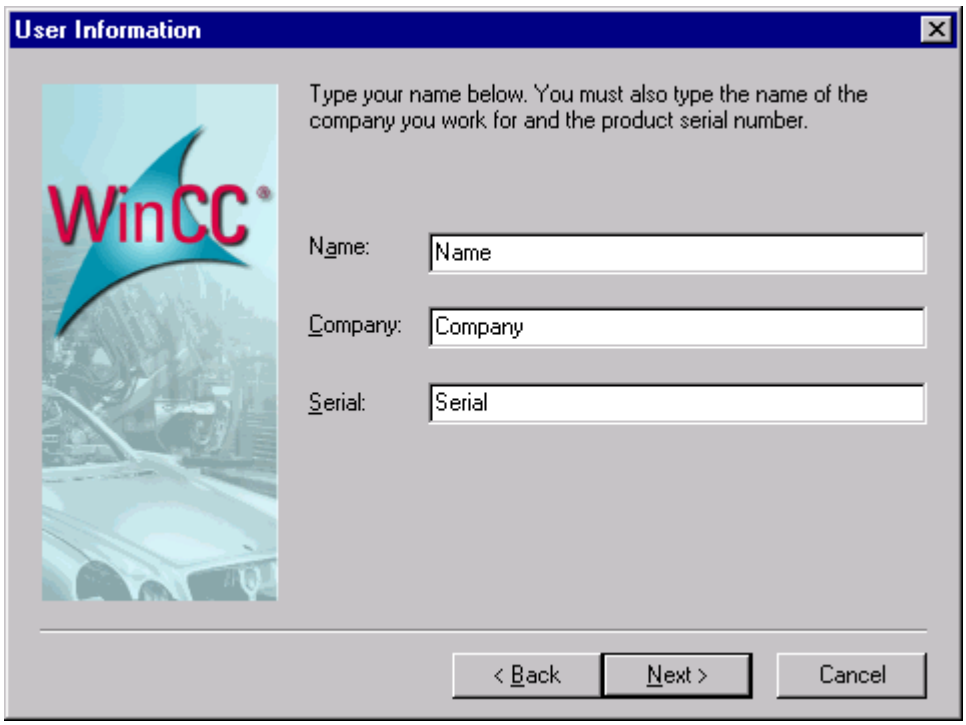
How to Transfer Licenses using Automation License Manager (Page 179)

5.6.4 How to transfer licenses via WinCC Setup

Introduction

Licenses can automatically be transferred during WinCC Setup. This is performed in the following steps.

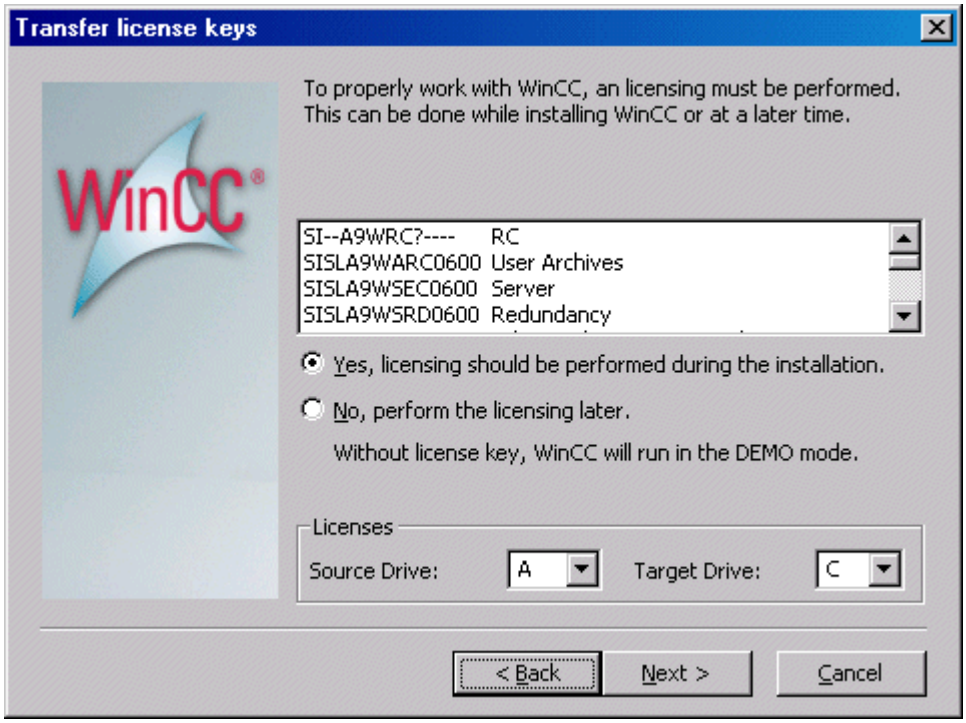
Registration



Note

The serial number (20-digit) is to be found on the license data carrier, the software product certificate, and using the display function of the Automation License Manager in the "License Number" column.

Transferring License Keys



Activate the option "Yes, licensing should be performed during installation".

The setup mask displays the licenses required by WinCC and is used to select the source and destination drives.

Note

Only V7.0 licenses are transferred during WinCC Setup.
You must manually upgrade licenses of existing old licenses or authorizations using Automation License Manager.

See also

System Requirements (Page 175)

Transferring licenses (Page 176)

5.6.5 How to Transfer Licenses using Automation License Manager

Introduction

You require the Automation License Manager program for license management. Setup automatically installs the program while installing WinCC.

Automation License Manager can also be installed subsequently on computer where WinCC has not been installed, for e.g. on a license server. Go to Start dialog on the WinCC DVD and select "Other Software". To start installing the Automation License Manager program use the Automation License Manager item in the Other Software dialog.

Automation License Manager Program

After the installation, a link to the Automation License Manager program is found in the "Start" menu of Windows under "SIMATIC > License Management".

The existing authorizations for WinCC prior to V6.0 SP3 and license keys for WinCC beginning with V6.0 SP3 and other SIMATIC products are displayed by the Automation License Manager in the "Manage" view.

Procedure

1. Plug the WinCC USB stick into your USB port and select the drive in the Automation License Manager navigation window.
   The WinCC licenses on the license data carrier are displayed.
2. Select a license from the table. You can select more than one license for transfer. Choose the "Transfer..." option from the pop-up menu of the license. The "Transfer License Key" dialog is opened. Select the target drive and confirm the selection with "OK".
3. The desired license is transferred and written to the destination drive in directory "AX NF ZZ".

For more information, please see the online help for the Automation License Manager.

Note

You may also move the licenses using "Drag & Drop".

See also

System Requirements (Page 175)

Transferring licenses (Page 176)

5.6.6 How to Remove Licenses

Introduction

Removing a license means deactivating it on the local drive and activating it again on the license data carrier so that the license can be used on other machines.

WinCC licenses are always removed using the Automation License Manager program.

Procedure

1. Plug the WinCC USB stick into your USB port and in the Automation License Manager navigation window select the drive on which the license you are wanting to remove is located.
   The WinCC licenses on the disk or drive are displayed.
2. Select the desired license from the table. You can also select multiple licenses for removing. Choose the "Transfer..." option from the license pop-up menu. The "Transfer License Key" dialog opens. Select the disk drive as the target drive and confirm the selection with the "OK" button.
3. The desired license is transferred and written to the destination drive in directory "AX NF ZZ".

For more information, please see the online help for the Automation License Manager.

Note

You may also move the licenses using "Drag & Drop".

See also

System Requirements (Page 175)

5.6.7 How to Collect Licenses

Introduction

You can collect licenses on different media such as USB memory sticks or hard disk drives.

You can thus collect all licenses belonging to a WinCC configuration and collectively transfer and remove them and thus transfer them easily from one computer to the other.

Licenses are collected by transferring the licenses from the used storage medium to the harddisk. On the other hand, licenses are removed by transferring them from the harddisk to various storage media. Both are performed with the Automation License Manager.

Transferring the License to the Hard Disk

1. Transfer the license from the license data carrier to the hard disk drive in the same way as you transfer licenses normally.
2. Repeat this process for each license data carrier.

Procedure for transferring collected licenses to a license data carrier

1. Select the licenses collected on the hard drive.
2. Transfer the license to the license data carrier by selecting "License Key > Transfer..." from the menu.

For more information, please see the online help for the Automation License Manager.

All licenses transferred to the license data carrier are labeled on it by a '1" in the "Number of license keys" column and can now be transferred to another machine.

See also

How to Transfer Licenses using Automation License Manager (Page 179)

5.6.8 How to Upgrade Licenses

Introduction

Upgrading the permitted number of tags (PowerTags) and the Archive tag amount (ArchivTags) is performed using the Automation License Manager.

You need the following:

- RT/RC licenses to be upgraded and archive licenses to be upgraded
- Powerpack license data carrier with upgrade license

Procedure

1. Plug the Powerpack license data carrier into a USB port.
2. Start the Automation License Manager using the Start menu. In the navigation window, select the drive where the license to be upgraded is located. Select this license from the table.
3. Select menu instruction "License Key" > "Upgrade...". The upgrade process is started.
4. The upgrade process concludes with the transfer of the upgraded license to the local drive.

Additional information may be found in WinCC Information System under the topic of "Migration > Upgrade Licenses" and in online help of Automation License Manager under "Working with the Automation License Manager" > "Handling License Keys" > "How to Upgrade a License".

See also

Management of Licenses (Page 175)

5.7 Diagnosis and Repair of Licenses

5.7.1 Diagnostics of Licensing Problems

License Check

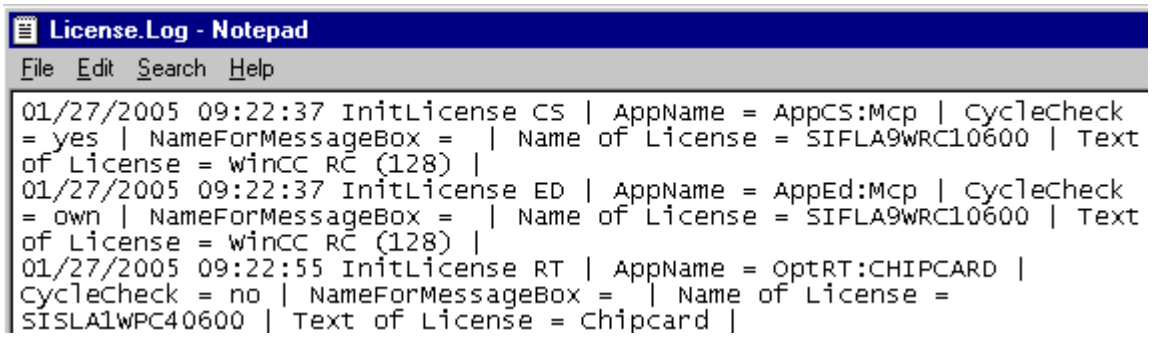
If WinCC goes into demo mode despite transferring the licenses, the Automation License Manager offers a diagnostics function to check the licenses.

Procedure

1. Select the view "Management" in the Automation License Manager.
2. Select the storage location that the authorization or the License Key to be checked is stored in, from the navigation window. The existing authorizations and Licenses are shown.
3. Select the authorization or license key to be checked from the table and select the entry "Check" from the pop-up menu.
   The selected license is checked and the result of the check is indicated in the table by means of a status icon.

The License.log File

The License.log diagnosis file displays the licenses called by WinCC. Upon a missing license, the corresponding entry is shown.
The file is saved in the "WinCC\Diagnose" folder that is automatically set up when WinCC is run for the first time.



Note

If the license for a used option is missing, WinCC switches to demo mode.

See also

WinCC in the Demo Mode (Page 174)

How to Restore a License Key (Page 184)

5.7.2 How to Restore a License Key

Introduction

A license (authorization) key is defective if it is no longer accessible on the hard drive and so cannot be removed by the Automation License Manager, or if the key disappears during transfer to the license data carrier.

Using "Support for License Management", the license key may be restored.

To contact your local agent for Automation & Drives, search our contact database at the following URL:

- http://www.automation.siemens.com/partner/index.asp (http://www.automation.siemens.com/partner/index.asp)

Preparations

If you contact "Support for License Management", please have the following information ready:

- Company data (Name, Address, Country, Telephone/Fax...)
- From license data carrier: The product number (e.g., "6AV..."), product description in plain text, and the serial number (license number).

Procedure

1. Select the view "Management" in the Automation License Manager. Switch to the view of the drive to which the license data carrier is linked.
2. From the table, select the license key to be restored. Select menu instruction "License Key" > "Restore". The "Restore License Key" dialog is opened.
3. Contact the "Support for License Management" and inform them of the product name, license number and the numerical inquiry code.
4. Customer Support gives you a numerical Enable Code. Enter this code in the entry field.
5. The lost license key is restored to your license data carrier (counter = 1) and can now be transferred to a local drive.

CAUTION
For several lost license keys, this process must be repeated for the appropriate number of times.

See also

Internet: Contact person database (http://www.automation.siemens.com/partner/index.asp)

Performance Data 6

6 Resources

6.1 Performance Data

Contents

This chapter provides important technical data and performance limits on WinCC V7.0.

6.2 Configurations

Quantity Structure in a Multi-user System

	Maximum
Server or redundant server pairs [1]	12
WinCC clients in a system	32 [2] [3]
Web clients in a system	50 [4]

[1] Central archive server is counted as one server. It cannot be used simultaneously as an operating unit.

[2] If the server is also used as an operating unit, the number of clients for this server is reduced to four.

[3] Mixed configuration: 32 Clients + 3 Web Clients

[4] Mixed configuration: 50 Web clients + 1 WinCC client (also for Engineering)

6.3 Graphics System

Configuration

	Maximum
Objects per picture [1]	No limit [2]
Levels per picture	32
Pictures (PDL files) per project	No limit [2]

	Maximum
Instances of fixed picture components in a system picture	31 instances of the same picture type
Picture size in pixels	10,000 x 10,000
Nesting levels of picture objects	20
Number of colors	Dependent on graphics card

[1] The number and complexity of the objects affect the performance.

[2] Limited by system resources.

Runtime

Change picture from empty screen to...	Time, in seconds
• Picture with standard objects (100 objects)	1
• Picture with 2,480 I/O fields (8 internal tags)	2
• Picture with 1,000 I/O fields (1,000 internal tags)	1
• Picture of 10 MByte size (bitmap)	1
• Message window	2
• Table with 4 columns, each with 120 values [1]	1

[1] The values specified apply to data from "Tag Logging Fast".

Note

The values depend on the hardware implemented.

6.4 Message system

Configuration

	Maximum
Configurable messages per server/single user	150.000
Process tags per message line	10
User text blocks per message line	10
Message classes (incl. system message classes)	18
Message types	16
Message priorities	17 (0...16)

Runtime

	Maximum
Messages per message archive	No limit [1]
Messages per short-term archive	1.000
Messages per long-term archive	1.000 [2]
Messages per message window	5.000 [3]
Continuos message load without loss (single user/server)	10/sec
Message flow (single user/server)	2,000/10 sec every 5 min [4]

[1] Limited by system resources.

[2] On single user station or server or on clients per server or per redundant server pair if "LongTimeArchiveConsistency" is set to "no". On single user, server, client or redundant server pair if "LongTimeArchiveConsistency" is set to "yes".

[3] On single user station or server or on clients per server or per redundant server pair.

[4] If the interval to the next message flow is under five minutes, messages may be lost.

Note

The message overload and continuous message flow can be created simultaneously on a single-user station or server.

6.5 Archiving system

Configuring

	Maximum
Trend windows per picture	25
Configurable trends per trend window	80
Tables per picture	25
Columns per table	12
Values per table	30.000
Archives per single user/server	100
Archive tags per single user/server [1]	80.000 [2]
Archive tags registered on WinCC CAS	120.000

[1] Dependent on the archive PowerPack used for the archive tags. 512 archive tags are contained on the basis version.

[2] V6.0: up to 30,000 tags. Later versions: up to 80,000 tags.

Note

In cases of a combination of the maximum values, high picture selection times can occur.

Runtime

	Maximum
Archiving in database for server/single user ("Tag Logging Fast")	5,000 values/second [1]
Archiving in database for server/single user ("Tag Logging Slow")	1,000 values/second [1] [2]
Trend printouts for each configured trend	The number of printed values matches the number of values shown in OnlineTrendControl.

[1] The stated values apply to archiving without signing-off of data.

[2] During "Tag Logging Slow", you must expect longer picture selection times for identical quantity structures than in "Tag Logging Fast".

6.6 User archives

Configuring

	Maximum
Total archives	No limit [1]
User archive fields	500 [2]
User archive data records	3.000 [2]
User Archive views	No limit [1]

[1] Limited by system resources.

[2] The product of the number of boxes and number of data records must not exceed 320,000, e.g. 3000 data records with a number of fields of 106 or 640 data records with 500 fields. In determining the actual number of cells, the first two columns (gray column and "ID" column) as well as column headers must be counted.

Runtime

The following measurement values are guideline values for WinCC user archives in Runtime. The values depend on the hardware used and the configuration.

Limit conditions

Hardware used:

- 1.5 GHz AMD Athlon 4
- 2 GB RAM
- No hardware linking

Software used:

- Windows Server 2003 SP2
- WinCC V7.0

Configuration of the user archives in the WinCC project used:

- One WinCC tag per field
- 300,000 entries each:
  - 10 fields with 30,000 data records.
  - 500 fields with 600 data records.

Determined Values (approx.)

	10 fields	500 fields
Picture change from a neutral picture to a picture with a linked UserArchiveControl. Measurement result depends on the fill level of the control: Full display takes up to 15 seconds during the first load or in the case of large configuration changes in the user archive.	1 second	5 seconds
Read record: Click the control button to read the value to the corresponding tags.	1 - 2 seconds [1]	n seconds [2]
Write record: Click the control button to write the value to the corresponding tags and display the tag contents in I/O fields.	1 - 3 seconds [1]	n seconds [2]
Focus change from first to last record.	1 - 2 seconds	1 - 2 seconds

[1] 10 fields with a total of 10 tags.

[2] 500 fields with a total of 500 tags.

6.7 Reports

Configuring

	Maximum
Configurable logs	No limit [1]
Log lines per body	66
Tags per log [2]	300

[1] Limited by system resources.

[2] The number of tags per log is dependent on the performance of the process communication.

Runtime

	Maximum
Simultaneously running message sequence reports per server/client	1
Simultaneously running message sequence reports	3

6.8 Scripting with VBS and ANSI-C

Runtime

The following measured vales indicate the difference between VB scripting and C scripting base on the comparison of orientation values. The values depend on the hardware implemented.

The measured values are specified in milliseconds.

Pentium 4 2.5 GHz, 512 MByte RAM

	VBS	ANSI-C
Set colors from 1,000 rectangles	220	1.900
Set output values from 200 I/O fields	60	170
Select a screen with 1,000 static texts which determine the object name and are issued as the return value	460	260
Read 1,000 internal tags	920	500
Re-read 1,000 internal tags	30	120
Conduct 100,000 calculations[1]	280	70

Pentium III 700 MHz, 512 MByte RAM

	VBS	ANSI-C
Set colors from 1,000 rectangles	610	4.440
Set output values from 200 I/O fields	170	670
Select a screen with 1,000 static texts which determine the object name and are issued as the return value	770	310
Read 1,000 internal tags	3.650	1.310
Re-read 1,000 internal tags	70	250
Conduct 100,000 calculations[1)]	820	170

[1)] Calculations in the example:

VBS

```
For i=1 To 100000
value=Cos(50)*i
Next
```

ANSI-C

```
for(i=1;i<=100000;i++)
{
dValue=cos(50)*i;
}
```

Note

The measured values can be negatively influenced by the type of configuration as well as other processes, such as Tag Logging or Alarm Logging.

6.9 Process Communication

Introduction

The following table provides information on the possible configurations and maximum number of connections.

Note

The limit values listed in the table are also dependent on the performance capability of the system and the quantity structure of the WinCC project (e.g. number of process values/time unit).

Configuration

Communication channels in WinCC[1]	PC-based[2]	MPI/ Profibus Soft-Net[3]	MPI/ Profibus Hard-Net[3]	Industrial Ethernet Soft-Net[3]	Industrial Ethernet Hard-Net[3]
SIMATIC S7 Protocol Suite[1]					
• MPI	---	8	44	---	---
• Soft-PLC	---	1	---	---	---
• Slot-PLC	---	1	---	---	---
• Profibus (1)	---	8	44	---	---
• Profibus (2)	---	8	44	---	---
• Named Connections	---	---	---	64	60
• Industrial Ethernet ISO L4 (1)	---	---	---	64	60
• Industrial Ethernet ISO L4 (2)	---	---	---	64	60
• Industrial Ethernet TCP/IP	---	---	---	64	60
SIMATIC S5 Programmers Port					
• AS 511	2[4]	---	---	---	---
SIMATIC S5 Serial 3964R					
• RK 512	2[4]	---	---	---	---
SIMATIC S5 Profibus FDL					
• FDL	---	---	50	---	---
SIMATIC S5 Ethernet Layer 4 + TCP/IP					
• Industrial Ethernet ISO L4 (2)	---	---	---	---	60
• Industrial Ethernet ISO L4 (2)	---	---	---	---	60
• Industrial Ethernet TCP/IP	---	---	---	60	60
SIMATIC 505 Serial					
• NITP / TBP	2[4]	---	---	---	---
SIMATIC 505 Ethernet Layer 4					
• Industrial Ethernet ISO L4 (1)	---	---	---	---	60
• Industrial Ethernet ISO L4 (2)	---	---	---	---	60
SIMATIC 505 Ethernet TCP/IP					
• Industrial Ethernet TCP/IP	---[5]	---	---	---	---
Profibus FMS					
• FMS	---	---	40	---	---
Profibus DP (V0-Master)					
• DP 1	---	---	122	---	---
• DP 2	---	---	122	---	---

Communication channels in WinCC[1]	PC-based[2]	MPI/ Profibus Soft-Net[3]	MPI/ Profibus Hard-Net[3]	Industrial Ethernet Soft-Net[3]	Industrial Ethernet Hard-Net[3]
• DP 3	---	---	122	---	---
• DP 4	---	---	122	---	---
Allen Bradley - Ethernet IP					
• CAMP[6]	---[5]	---	---	---	---
Modbus TCPIP					
• Modbus TCP/IP	---[5]	---	---	---	---
OPC					
• Data Access	---[5]	---	---	---	---
• XML-DA	---[5]	---	---	---	---

Remarks

[1] In principle, all communication channels can be combined with each other. However, the subordinate communication drivers can lead to limitations.

When the SIMATIC S7 Protocol Suite is used, a maximum of 64 S7 connections can be operated. A typical configuration contains 60 S7 connections, for example.

Examples:

- 8 S7 connections via "MPI" and 52 S7 connections via "Industrial Ethernet TCP/IP"

or

- 60 S7 connections via "Industrial Ethernet TCP/IP"

[2] COM1/COM2 or internal software interfaces for SIMATIC S7 Protocol Suite communication "Soft-PLC" and "Slot-PLC" as well as DCOM for OPC.

[3] In the case of Soft-Net, communication runs on the PC processor. In the case of Hard-Net, the communication card has its own microprocessor and relieves the PC processor during communication.

Only a Soft-Net module may be operated in the PC for the process communication. Combinations with Hard-Net communication cards are possible. The driver software for Hard-Net communication cards are supplied with the SIMATIC NET CDs enclosed.

Hard-Net communication cards enable the parallel operation of up to 2 protocols, e.g. Ethernet communication using the SIMATIC S7 Protocol Suite and SIMATIC S5-Ethernet. In this case, a reduction of approx. 20% of the table values must be taken into account.

Example:

- 40 connections using the "SIMATIC S7 Protocol Suite" combination and 8 connections via "SIMATIC S5 Ethernet".

[4] Depending on the number of serial interfaces. Can be expanded using communication cards with several serial interfaces, e.g. Digi-Board with 8/16 ports.

[5] Communication is routed via the standard Ethernet port of the computer.

The maximum number of connections is restricted by the available system resources and their performance data, particularly in terms of the CPU, RAM and the Ethernet connection.

[6] CAMP = Common ASCII Message Protocol

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