



SIMATIC HMI

WinCC V8.1 Update 3 WinCC: General information and installation

System Manual




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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.

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 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
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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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WinCC V8.1 Installation / Release Notes

1.1 WinCC Installation Notes

1.1.1 WinCC installation instructions

Contents

This documentation contains important information on the scope of delivery, as well as on the installation and operation of WinCC.

The information contained here takes precedence over the information contained in the manual and online help.

1.1.2 Scope of delivery

Components supplied

WinCC V8.1 is available as a basic package or upgrade package and as a download package "OSD" (Online Software Delivery).

1.1 WinCC Installation Notes

You will receive the following components:

Components ^{1) 2)}	Basic / Upgrade / Download Package
WinCC V8.1 DVD: <ul style="list-style-type: none"> • WinCC V8.1 • WinCC/WebUX • WinCC/WebNavigator • WinCC/DataMonitor • WinCC/Connectivity Pack • WinCC/Connectivity Station • Microsoft SQL Server 2022 for WinCC V8.1 • SIMATIC Logon V2.0 ^{3) 4)} • Automation License Manager V6.2 Update 2 • AS-OS-Engineering V10.0 	X
Additional Content DVD: <ul style="list-style-type: none"> • SQL Server Management Studio • Visual C++ Redistributable for Visual Studio: 2005 / 2008 / 2010 / 2012 • WinCC V8.1 – Printable online help (PDF files) 	X
Required licenses	X
Certificate of License	X

1) Refer to the software requirements in the installation and release notes.

2) If you use the "SIMATIC S7-1200, S7-1500 Channel" with more than 10 connections, you need a SIMATIC NET license, e.g. "SIMATIC NET - SOFTNET-IE S7 Power Pack V19".

3) If you install SIMATIC Logon, a computer restart may be necessary.

4) Use at least SIMATIC Logon V2.0.

Note

Printing installation notes

The installation notes for the respective products are also provided as a PDF file.

You can find the installation and release notes on the WinCC DVD in the "Install_and_Release-Notes" folder.

You need at least Adobe Acrobat Reader V5.0. You can download the Adobe Acrobat Reader free of charge from the following URL:

- <http://www.adobe.com/products/acrobat>

Communication drivers

The communication drivers included in the package do not need an additional license:

- Allen Bradley - Ethernet IP
- Mitsubishi Ethernet

- Modbus TCP/IP
- Omron Ethernet-IP
- OPC
- OPC UA WinCC Channel ¹⁾
- PROFIBUS DP
- SIMATIC 505 TCP/IP
- SIMATIC S5 Ethernet Layer 4
- SIMATIC S5 Profibus FDL
- SIMATIC S5 Programmers Port AS511
- SIMATIC S5 Serial 3964R
- SIMATIC S7 Protocol Suite (SIMATIC S7-400)
- SIMATIC S7-1200, S7-1500 Channel
- SIMATIC TI Ethernet Layer 4
- SIMATIC TI Serial
- Simotion
- SinumerikNC (SINUMERIK, SIMATIC S7-300)
- System Info
- WinCC Unified Channel ¹⁾
- Alarm Channel (Alarm Logging)

1) You need a Connectivity Pack license for the WinCC OPC UA server.

2) You need a Connectivity Pack license for the "WinCC Unified Channel". In WinCC Unified, the station requires a Unified Collaboration license.

See also

Information on WinCC CS (Page 75)

Overview of the licensing (Page 244)

<http://www.adobe.com/products/acrobat> (<http://www.adobe.com/products/acrobat>)

1.1.3 SIMATIC WinCC: Product compatibility and supported functions

To use the software with other SIMATIC products you must ensure that the product versions match and support the required functions.

- You determine the version compatibility with the compatibility tool.
- Note the additional information on the individual products and functions.

WinCC versions in distributed systems

The same WinCC version must be installed on all WinCC stations used in the WinCC system.

These include, for example:

- WinCC servers, redundant servers, archive servers, file servers
- WinCC clients with their own project, WinCC clients without their own project
- PCs on which WinCC options are installed, e.g. WebNavigator server, WebNavigator client, WinCC/Audit, WinCC/Calendar Options

Mixed configurations with different WinCC versions on servers, clients or PCs with WinCC options are not released.

Always install WinCC updates on all PCs in the WinCC system. If different update versions are installed on the clients or servers, no configuration changes are possible in the WinCC project, for example.

SIMATIC Process Historian

Check which functionality is supported by the SIMATIC Process Historian version that is used in each case.

For more information, refer to the documentation for the SIMATIC Process Historian.

Installing PH-Ready / IS-Ready

You install "PH-Ready" and "IS-Ready" from the "Process Historian / Information Server" DVD.

Compatibility tool

With the compatibility tool, Industry Online Support gives you a function you can use to put together a compatible selection of software products or to check existing configurations for compatibility.

In entry 64847781 you can access the compatibility tool and find additional information on how to use the tool:

- SiePortal: Compatibility tool for automation and drives (<https://support.industry.siemens.com/cs/ww/en/view/64847781>)

1.1.4 Licenses and Licensing

Introduction

The WinCC software is protected, and can only be used in its full measure with a valid license.

Each installed software and option used requires a valid license for unrestricted operation of WinCC. The licenses for optional packages must be ordered separately.

You will receive the necessary license keys for installing the licenses as follows:

- As storage medium with license keys
- Via the internet (online software delivery)

When you install a license, it is transferred to a local drive and checked out on the storage medium so that WinCC can use this license.

Note**Microsoft Corporation: License agreement**

The licensee is still required to confirm that the software (SW) contains licensed software by Microsoft Corporation or its subsidiaries.

The licensee hereby agrees to be bound by the terms and conditions of the appended license agreement between Microsoft SQL Server and end user, and to fulfill the same.

Notes on license conditions

Observe the enclosed license conditions, which are also displayed during installation.

You need V8.1 licenses for WinCC V8.1.

The SIMATIC WinCC software is copy-protected against unlicensed use.

More information on licenses and license types:

- "Activating and testing ASIA licenses (Page 15)"
- WinCC Information System:
 - "Licensing > Overview of the licensing (Page 244)"
 - "Licensing > Basic license types and license types in WinCC (Page 249)"

Installed licenses are required to enable proper operation of WinCC. If WinCC is installed without licenses, the program will switch to demo mode at start-up.

Note**Process mode only with a valid license**

It is not allowed to run WinCC in process mode without a valid license.

Cumulating licenses

The cumulation of more than one license per component subject to license is only possible for the following licenses or licenses for the following options:

- WinCC Archive licenses
- WinCC/DataMonitor
- WinCC/WebNavigator
- WinCC/WebUX
- WinCC/IndustrialDataBridge

1.1 WinCC Installation Notes

- WinCC/PerformanceMonitor
- SIMATIC Information Server

Other licenses cannot be cumulated.

Demo mode

If a license is missing for one or multiple components, WinCC will run in demo mode.

WinCC also switches to demo mode when the maximum authorized number of process tags or archive tags is exceeded in a project.

To exit WinCC demo mode, install the required licenses.

Behavior in Runtime

In demo mode, you can use the WinCC software fully for a maximum of one hour. After this period, the operation of WinCC violates the license agreements.

After one hour, the WinCC Explorer and the editors will be closed.

In Runtime, the system will request the acquisition of a valid license. This dialog will appear every 10 minutes.

Details on the demo mode in the WinCC Information System:

- "Licensing > WinCC in the Demo Mode (Page 252)"

Microsoft SQL Server 2022

A license is necessary to use the Microsoft SQL Server database. This license is readily available if WinCC is licensed and properly installed.

The SQL Server licensed with the WinCC installation may only be used in conjunction with WinCC.

Its use for other purposes requires an additional license. These may include:

- Use for internal databases
- Use in third-party applications
- Use of SQL access mechanisms that are not available via WinCC

Uninstalling

After uninstalling WinCC, you must also uninstall the "WinCC" Microsoft SQL Server instance:

Under "Control Panel" > "Software", select the "Microsoft SQL Server 2022" entry to uninstall.

Installing licenses

You can use the Automation License Manager to install licenses.

Licenses can be installed during installation of WinCC or at a later time. You can find the Automation License Manager in the Microsoft Windows Start menu in the "Siemens Automation" program group. After-the-fact installation of a license will take effect upon restart of your computer.

The following requirements must be met for installing licenses:

- The storage medium containing the licenses must not be write-protected.
- You can install the RC licenses on a license server for the configuration. You do not have to install the licenses on the local drive.
- Licenses may only be installed on an uncompressed drive.

Note**Uninstalling WinCC: Licenses remain installed**

After uninstalling WinCC, the licenses remain installed on the system.

Note**Installing licenses before WinCC starts**

Install all required licenses before you start WinCC.

If one of the required licenses is missing, WinCC switches to demo mode when the program starts.

See also

Software Has a Value (Page 243)

Overview of the licensing (Page 244)

WinCC in the Demo Mode (Page 252)

Basic license types and license types in WinCC (Page 249)

Activating and testing ASIA licenses (Page 15)

1.1.5 Activating and testing ASIA licenses

Overview

The license keys for WinCC Runtime and WinCC RC (Runtime and Configuration) are provided on the supplied license storage medium "License Key USB Hardlock".

The licensed ASIA version is executable in parallel to the European version by switching to Unicode.

The "License Key USB Hardlock" (dongle) checks the following conditions:

- WinCC GUI language
- Runtime language
- The Text Library contains an Asian language.
- Asian characters are used in the WinCC project.
- Operating system settings

1.1 WinCC Installation Notes

You can find more information about installing the license under "Licenses and licensing".

Note

It is not allowed to run WinCC in process mode without a valid license.

Installed Languages

A newly created project receives all installed WinCC languages as project languages.

Delete configuration languages

If you do not have a license for an ASIA version and delete the Asian project languages in the text library, the WinCC project continues to run in demo mode.

To disable Demo mode, close the WinCC project. When reopened it is recognized that the WinCC project no longer requires licenses for an ASIA version.

Testing the validity of the licenses

If you start a correctly licensed WinCC version without a connected dongle, the following error message appears:



The same error message appears after a few minutes if you disconnect the dongle from the computer with a correctly licensed WinCC version.

If this error message does not appear, a non-licensed WinCC version is installed.

No right of usage for WinCC is available in this case. Uninstall this WinCC version and obtain a legally licensed version of WinCC V8.

If necessary, contact WinCC Support and provide the serial number of your software version:

- <http://www.automation.siemens.com/partner/index.asp> (<http://www.automation.siemens.com/partner/index.asp>)

You can find the serial number on the "Certificate of License" (CoL).

Working with the "License Key USB Hardlock"

Please note the following:

- Do not edit data on the "License Key USB Hardlock".
The actions not allowed include:
 - Rename data
 - Delete data
 - Copy data to the "License Key USB Hardlock"
- Do not format the "License Key USB Hardlock".
- Do not remove the "License Key USB Hardlock" from the PC while WinCC is running.

NOTICE
<p>Do not remove the "License Key USB Hardlock" dongle</p> <p>If you remove the dongle from the computer, an error message is generated and WinCC switches to Demo mode.</p> <p>If you re-connect the dongle to the computer, the error message disappears and Demo mode is disabled. WinCC works once again in licensed mode.</p>

See also

Licenses and Licensing (Page 12)

<http://www.automation.siemens.com/partner/index.asp> (<http://www.automation.siemens.com/partner/index.asp>)

1.1.6 WinCC installation requirements

1.1.6.1 WinCC Installation Requirements

Introduction

You will need special hardware and software for the installation of WinCC. The requirements are described in the chapters "Hardware Requirements for Installation" and "Software Requirements for Installation".

Note

Microsoft Windows operating system: Avoid changes in system

Microsoft Windows settings deviating from default can have an effect on operation of WinCC.

Observe this note particularly for the following changes:

- Change of processes and services in Control Panel.
 - Changes in Microsoft Windows Task Manager.
 - Changes in Microsoft Windows registry.
 - Changes in Microsoft Windows security policies.
-

The first check if certain conditions are met is already executed during the installation of WinCC. The following conditions are checked:

- Operating system
- User rights
- Graphic Resolution
- Internet Explorer
- MS Message Queuing
- Due Complete Restart (Cold Restart)

Error Messages

If one these conditions is not met, the WinCC installation will be aborted and an error message will be displayed. For details about the error messages displayed see the table below.

Error Message	Explanation
To execute installation properly, restart the computer	The software installed on your computer requires a restart. Before WinCC can be installed, the computer should be restarted once.
This application requires VGA or any higher resolution	Check the settings of the connected monitor and upgrade the graphic card, if necessary.
You do not have administrator rights. Log on as administrator.	Administrator rights are required for the installation. Log in to Microsoft Windows again as a user with administrator rights.

Error Message	Explanation
Setup has detected that unInstallShield is active. Please close unInstallShield and restart Setup.	Close unInstallShield. This message may also indicate that you are lacking administrator rights for this installation. In this case, log on to Microsoft Windows again as a user with administrator rights.
The Microsoft Message Queuing services are not installed.	Install the Microsoft Message Queuing services. To do this, you will need the Microsoft Windows installation CD.

See also

Defining Access Rights in the Operating System (Page 31)

How to Adapt the Windows Security Policies (Page 37)

Notes on Data and System Security (Page 27)

Software requirements for installing WinCC (Page 21)

Hardware requirements for installing WinCC (Page 19)

Microsoft SQL Server for WinCC (Page 25)

1.1.6.2 Hardware requirements for installing WinCC

Introduction

Certain hardware configuration conditions must be fulfilled for installation.

Hardware requirements

WinCC supports all common IBM/AT-compatible PC platforms.

To work efficiently with WinCC, select a system with the recommended specifications.

Note

Unless noted to the contrary, the same requirements as for servers are applicable to single-user systems.

		Minimum	Recommended
CPU	Microsoft Windows 10 / Microsoft Windows 11 (64-bit)	Dual-core CPU Client/single-user system 2.5 GHz	Multi-core CPU Client: 2.7 GHz Single-user system: 2.7 GHz
	Microsoft Windows Server 2019 / Microsoft Windows Server 2022	Dual-core CPU Client/single-user system server: 2.5 GHz	Multi-core CPU Single-user system/server: 3.5 GHz

1.1 WinCC Installation Notes

		Minimum	Recommended
Work memory	Microsoft Windows 10 / Microsoft Windows 11 (64-bit)	Client: 2 GB Single-user system: 4 GB	8 GB
	Microsoft Windows Server 2019 / Microsoft Windows Server 2022	4 GB	16 GB
Free disc space on the hard drive - For installing WinCC - For working with WinCC ^{1) 2)}		Installation: • Client: 1.5 GB • Server: > 1.5 GB Working with WinCC: • Client: 1.5 GB • Server: 2 GB	Installation: • Client: > 1.5 GB • Server: 2 GB Working with WinCC: • Client: > 1.5 GB • Server: 10 GB Archive databases may require additional disc space.
Virtual work memory ³⁾		The size of the swap file depends on the memory configuration of the PC. Recommended setting: • "Swap file is managed automatically"	
Color depth/color quality		256	Highest (32-bit)
Resolution		800 * 600	1920 * 1080 (full HD)

1) Depending on project size as well as size of archives and packages.

2) WinCC projects should not be stored on compressed drives or directories.

3) Virtual work memory: Check the applicable Microsoft requirements for the Microsoft Windows edition you are using.

The recommended value in the "Size of swap file for a specific drive" area is a guide for the "Total size of swap file for all drives". Enter the recommended value in both the "Start size" field and the "Maximum size" field.

More information: "SiePortal: Settings for the virtual work memory (FAQ entry 20440472) (<http://support.automation.siemens.com/WW/view/en/20440472>)".

Note

In the case of online configuration, the recommended requirements constitute the minimum requirement.

Virtualization

The following virtualization systems have been tested:

- Microsoft Hyper-V 2019 / 2022
- VMware ESXi 7.0 / 8.0 Update 2

Requirement

The performance data of the virtual computers must meet the minimum requirements for WinCC clients.

You can find more information on virtualized environments with WinCC in the following FAQ:

- SiePortal: Virtualization (FAQ entry 49368181) (<http://support.automation.siemens.com/WW/view/en/49368181>)

See also

Defining Access Rights in the Operating System (Page 31)

Notes on Data and System Security (Page 27)

Software requirements for installing WinCC (Page 21)

1.1.6.3 Software requirements for installing WinCC

Introduction

Certain requirements concerning operating system and software configuration must be met for the installation.

Note

WinCC in a domain or workgroup

WinCC is enabled for operation within a domain or workgroup.

Note however that domain group policies and restrictions in the domains may prevent installation. In this case, remove the computer from the domain before installing Microsoft Message Queuing, Microsoft SQL Server and WinCC. Log on to the computer concerned locally with administrator rights. Carry out the installation. Following successful installation, the WinCC computer can be registered in the domain again. If the domain-group policies and domain restrictions do not impair the installation, the computer must not be removed from the domain during installation.

Note however that domain group policies and restrictions in the domain may also hinder operation. If these restrictions cannot be overcome, operate the WinCC computer in a work group. If necessary, contact the domain administrator.

Operating systems

Operating system languages

WinCC is released for the following operating system languages only:

- German
- English
- French
- Italian
- Spanish
- Chinese (Simplified, PR China)

1.1 WinCC Installation Notes

- Chinese (Traditional, Taiwan)
- Japanese
- Korean
- Multilingual operating system (MUI version)

Configurations

When using more than one server, all servers must be operated with a uniform operating system:

Microsoft Windows Server 2019 or 2022, uniformly Standard or Datacenter edition in each case.

Single-user systems and clients

Operating system	Configuration	Comments
Microsoft Windows 10 ¹⁾	Pro Enterprise	Standard installation 64-bit If you are using SIMATIC NET, please refer to the information in the SIMATIC NET "Readme" file.
Microsoft Windows 10 ¹⁾	Enterprise LTSC (Long-Term Servicing Channel)	Standard installation 64-bit If you are using SIMATIC NET, please refer to the information in the SIMATIC NET "Readme" file.
Microsoft Windows 11 ¹⁾	Pro Enterprise	Standard installation 64-bit If you are using SIMATIC NET, please refer to the information in the SIMATIC NET "Readme" file.

1) The currently released build versions of Windows 10 or Windows 11 are listed in the compatibility tool.

You can also run single-user systems and clients in WinCC multi-user systems on Microsoft Windows Server 2019 / 2022.

WinCC server

Operating system	Configuration	Comments
Microsoft Windows Server 2019	Standard Datacenter	64-bit
Microsoft Windows Server 2022	Standard Datacenter	64-bit

WinCC server with up to three WinCC clients

It is also possible to operate a WinCC Runtime server on Microsoft Windows 10 or Microsoft Windows 11 if you are not running more than three clients.

WinCC ServiceMode is not released for this configuration.

Note**Only enable the terminal server for WinCC/WebNavigator**

WinCC is not suitable for use on a Microsoft terminal server.

You can use the Microsoft terminal server only in connection with the WinCC Web client. Note the installation instructions of the WinCC/WebNavigator.

Virus scanner

You can find information on the use of virus scanners as well as approved virus scanner versions in the WinCC Release Notes under "Notes on operation (Page 57)".

Microsoft Windows Patches / Updates: Compatibility with SIMATIC products

Note the latest information on compatibility of SIMATIC products with Microsoft patches and updates:

- SiePortal: FAQ 18752994 (<https://support.industry.siemens.com/cs/ww/en/view/18752994>)

Microsoft Windows computer name**Do not change the computer name**

Do not change the Windows computer name after installing WinCC installation.

Illegal characters

The following characters are not permitted in the computer name:

- . , ; : ! ? " ' ^ ` ~ _
- + = / \ | @ * # \$ % & § °
- () [] { } < >
- Space character

Note the following:

- Only uppercase relevant
- The first character must be a letter.

Microsoft Message Queuing services

WinCC requires Microsoft Message Queuing services.

During the WinCC installation, the corresponding services are installed and configured.

Internet Explorer - requirements

You can find the browser requirements for WinCC options in the respective installation notes for the option.

1.1 WinCC Installation Notes

You need Microsoft Internet Explorer to open the WinCC online help. Recommended versions:

- Microsoft Internet Explorer V11.0 (32-bit)

If you wish to fully use WinCC's HTML Help, you must permit the use of JavaScript under "Internet Options" in Internet Explorer.

Note

Do not disable Internet Explorer.

Operation with multiple network adapters

When a server is used with several network adapters, read the notes in the WinCC Information System under "Configurations > Distributed Systems > System behavior in Runtime > Special features of communication using a server with several network adapters".

Adapting security policies

The operating system must permit the installation of unsigned drivers and files.

Detailed information is available in the section "Adapting Security Policies under Windows".

Note

Operating system update

An update of the operating system is not permitted if WinCC is started.

Start the computer again after updating the operating system.

Checking the "Path" environment variable

Before starting WinCC, you should check the entries in the "Path" environment variable.

A few programs insert paths containing quotation marks in the environment variable. These paths can prevent WinCC from starting or limit its functionality. The paths with quotation marks can also interfere with the software of other manufacturers.

1. To open the "System properties" dialog, search for "Advanced system settings" in the Windows search window.
2. In the "Advanced" tab, click the "Environment variables" button.
3. Display the value of the "Path" system tag.

If the "Path" system variable contains paths with quotation marks, reorder the entries so that these paths are called last.

Microsoft Internet Information Service (IIS)

During the WinCC installation, the Microsoft Internet Information Service (IIS) is installed for the of the following components or options:

- WinCC/DataMonitor
- WinCC/WebNavigator
- WinCC/WebUX

See also

Notes on Data and System Security (Page 27)

Defining Access Rights in the Operating System (Page 31)

Installing WinCC (Page 38)

How to Adapt the Windows Security Policies (Page 37)

Hardware requirements for installing WinCC (Page 19)

Microsoft SQL Server for WinCC (Page 25)

Notes on operation (Page 57)

SiePortal: FAQ 18752994 (<https://support.industry.siemens.com/cs/ww/en/view/18752994>)

1.1.6.4 Microsoft SQL Server for WinCC

WinCC requires Microsoft SQL Server 2022 in the 64-bit version:

- Microsoft SQL Server 2022 64-bit Standard Edition
- Microsoft SQL Server 2022 64-bit Express Edition

SQL Server is included automatically in the WinCC installation.

Microsoft SQL Server 2022

Licensing

Read the information on licensing Microsoft SQL Server under "Licenses and licensing".

User rights

Appropriate user rights must be set up to access the Microsoft SQL Server data. For more information, refer to the section "Specifying access rights in the operating system (Page 31)".

Encrypted connection

To increase security, use encrypted communication.

1.1 WinCC Installation Notes

You can find information on this in the following Microsoft entries:

- Internet: "Server network configuration" (<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/server-network-configuration?view=sql-server-ver15>)
- Internet: "Configure SQL Server Database Engine for encrypting connections" (<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/configure-sql-server-encryption?view=sql-server-ver15>)

Regional Settings: Disable "Unicode UTF-8" beta setting

To avoid conflicts when accessing the SQL server, disable the following option in the "Regional Settings" dialog:

- "Beta: Use Unicode UTF-8 for worldwide language support"

WinCC/Connectivity Pack

When you install WinCC/Connectivity Pack, the required connectivity components are installed along with the Microsoft SQL Server.

SQL server instance "WinCC"

During installation, a new "WinCC" instance with the required settings is created with Microsoft SQL Server.

This instance is always installed in English. The language in which existing SQL server instances have been installed has no effect on this. Existing instances are not affected by the Service Pack.

"WinCC" instance after removing WinCC

When WinCC is removed, the "WinCC" SQL server instance remains installed and must be removed manually for licensing reasons.

Installation of Microsoft SQL Server Express

Microsoft SQL Server Express is installed in the following cases:

- Installation of "WinCC client"
- Installation of the WinCC V8 demo version

Requirement for the installation of Microsoft SQL Server Express

The Microsoft Windows user name of the user performing the installation must not contain any space characters.

SQL Server Management Studio (SSMS)

The SQL Server Management Studio is no longer part of the SQL Server installation.

If you want to install SQL Server Management Studio, use the provided "Additional Content" DVD.

SQL Server port number

You can manually configure the port number for the Microsoft SQL Server communication.

You can find more information in the following Microsoft article:

- Internet: "Configure a Server to Listen on a Specific TCP Port" (<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/configure-a-server-to-listen-on-a-specific-tcp-port?view=sql-server-ver15>)

See also

Defining Access Rights in the Operating System (Page 31)

Software requirements for installing WinCC (Page 21)

Notes on Data and System Security (Page 27)

Ports and protocols (Page 86)

Internet: "Server network configuration" (<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/server-network-configuration?view=sql-server-ver15>)

Access rights in the operating system (Page 31)

Internet: "Configure a Server to Listen on a Specific TCP Port" (<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/configure-a-server-to-listen-on-a-specific-tcp-port?view=sql-server-ver15>)

Internet: "Configure SQL Server Database Engine for encrypting connections" (<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/configure-sql-server-encryption?view=sql-server-ver15>)

1.1.6.5 Notes on Data and System Security

Introduction

System security when using WinCC can be increased by implementing simple measures.

You can find more information in the "WinCC Release Notes > Notes on Operation > Information on the Microsoft Windows operating system (Page 59)".

You can find information on the remote access under "WinCC Release Notes > Notes on WinCC > Remote access and Remote Desktop Protocol (RDP) (Page 83)".

Information on write access for WinCC project folders can be found under "Access rights in the operating system > Defining Access Rights in the Operating System (Page 31)".

Activating WinCC remote communication

On WinCC systems, remote communication is disabled by default in the "SIMATIC Shell" dialog after the installation.

1.1 WinCC Installation Notes

For the following scenarios, you must activate the remote communication of the PCs involved:

- Client-server communication
- Redundant system
- WinCC option "WebNavigator"
If the WebNavigator client is not running on the same PC as the WebNavigator server, remote communication must be enabled.

To enable remote access, follow these steps:

1. Open the communication settings using the context menu of SIMATIC Shell in Microsoft Windows Explorer.
2. Select the "Remote Communication" option.
3. Configure the encrypted communication in the network: Select the PSK key and the port.
4. Select the network adapter and, if required, the Multicast settings.

Firewall settings

To limit the incoming rule for the CCAgent or CCEServer, you can change the parameter "Remote address" from "Any" to "Local subnet".

You can edit the firewall rules in the "Windows Firewall with Advanced Security" dialog.

Preventing Access to the Operating System Layer in Runtime

If the Microsoft Windows Selection dialog is opened in an activated WinCC project, access to the Microsoft Windows operating system is possible using this function. A Microsoft Windows Selection dialog opens, for example, when data is imported or files are selected.

Protect the corresponding function by executing an operator authorization via the User Administrator to prevent unauthorized access to the operating system.

Preventing access to the Microsoft Windows toolbar

You can use the computer properties to prevent the Microsoft Windows taskbar from being displayed in runtime.

- Activate the "Disable keys" option under "Parameters" in the "Properties - Computer" area of the "Computer" editor.
This disables all shortcut keys for operating system access.
- Deactivate the "Keep taskbar on top of other windows" setting in Microsoft Windows.

Disabling shortcut keys

If you would like to disable shortcut keys, you must adapt the group policies in the operating system management.

A detailed description of this can be found in the FAQ with entry ID "44027453" in the SIMATIC Customer Online Support:

- SiePortal: WinCC FAQ 44027453 (<http://support.automation.siemens.com/WW/view/en/44027453>)

Shortcut key <Ctrl+Esc>

If you disable the <Ctrl+Esc> shortcut key, the following shortcut keys are also disabled in runtime:

Shortcut keys	Function
<Windows key+U>	System utility program manager
Press <Shift> five times	Locking function
Press <Shift right> for eight seconds	Impact delay
<Alt left+Shift left+Num>	Keyboard mouse
<Alt left+Shift left+Print>	High contrast

Note**Microsoft Windows Control Panel**

These functions can be configured using the Microsoft Windows Control Panel.

If the functions are activated in the system control before activating WinCC Runtime, they are no longer locked in runtime.

Suppressing Microsoft Windows notifications and alarms in Runtime (kiosk mode)

To prevent the display of Windows notifications and Windows alarms on a PC in Runtime, follow these steps:

1. Enter "Notifications and actions" in the search field of the Windows taskbar. The settings for Microsoft Windows notifications and actions open.
2. Click "Notification wizard settings".
3. Enable the following settings in the notification wizard:
 - Enable the "Only alarms" option.
 - Under "Automatic rules", disable the "When I'm using an app in full-screen mode/Alarms only" option.

Disabling the Plug&Play services

If the Plug&Play service is enabled, an operating system message may occur in WinCC Runtime when scanning for drivers.

This allows access to the operating system.

Disable the "Plug&Play" service in the Microsoft Windows Services Manager. Activate the service only if you actually need access, for example, to a chip card reader.

Microsoft Windows event display: User administration

You can also find changes in the User administration via the User Administrator or the WinCC UserAdminControl as an entry in Microsoft Windows event display.

Continuous security event logging

WinCC continuously logs security events while the editors of WinCC Configuration Studio and WinCC Runtime are running.

WinCC stores security events in a "WinCC Event Security" log file. Access to this log file via the Microsoft Windows Event Viewer is restricted to users in the "SIMATIC HMI AUDIT" and "Administrator" user groups.

If the free storage capacity for log files falls below a limit of 10%, a security event log is created.

The "WinCC Event Security" log files have a maximum file size of 4 MB. Once this file size is reached, a new log file is created.

Integrity check of the installed WinCC files

With the integrity check tool, you can determine whether the files of your WinCC installation are unchanged and correspond to the delivery state.

The hash value and file signatures are checked, for example.

You can find the "SieSoftIntCheck.exe" tool in the following path:

- <Installation path>\WinCC\SmartTools\SiemensSoftwareIntegrityCheck

Open the tool in the Microsoft Windows window "Command prompt" (CMD).

The WinCC installation files are checked and the result is written into a log file.

Parameters

To display a list of available parameters, enter the following command:

- `SieSoftIntCheck.exe -?`

You can set the following parameters, for example:

- Storage location of the log files "SieSoftIntCheck_YYYY-MM-DD-hh-mm-ss_result.csv" and "SieSoftIntCheck_YYYY-MM-DD-hh-mm-ss_logfile.txt"
- Display of the hash and signature information
- Exception of files with low priority.

Establishment of regular integrity checks

1. If you want to perform a regular integrity check, first create a batch file.

Example for the batch file:

- `cd <Installation path>\WinCC\SmartTools\SiemensSoftwareIntegrityCheck`
- `SieSoftIntCheck.exe -ResultDir=<Output directory for the result and the log file>`

2. Set up regular execution of this batch file with the Windows Task Scheduler application.

Checklist for technical implementation

You can find more information on configuring your system in the following document in the "Industry Online Support":

- WinCC Systems: Checklist for Technical Implementation

See also

Information on the Microsoft Windows operating system (Page 59)

Microsoft SQL Server for WinCC (Page 25)

Ports and protocols (Page 86)

Performance Data (Page 261)

Hardware requirements for installing WinCC (Page 19)

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Notes on operation (Page 57)

Remote access and Remote Desktop Protocol (RDP) (Page 83)

SiePortal: WinCC FAQs (<http://support.automation.siemens.com/WW/view/en/10805583/133000>)

SiePortal: WinCC FAQ 44027453 (<http://support.automation.siemens.com/WW/view/en/44027453>)

1.1.6.6 Access rights in the operating system

Defining Access Rights in the Operating System

Introduction

To support you in protecting your system, WinCC offers a structured user administration:

- Protect your system against unauthorized access.
- Assign each user the required rights.

In order to work with WinCC, certain folders can be enabled for access via the network. For security reasons, you should only assign access rights to these folders to authorized users. You manage access rights via the Microsoft Windows standard user groups and user groups created by WinCC.

Access rights specified in WinCC

Following WinCC installation, WinCC automatically establishes the following local groups in Microsoft Windows User and Group Administration:

- "SIMATIC HMI"
All users must be members of the "SIMATIC HMI" user group. These members can create local projects, and can process, start, and access these projects remotely. Access to the WinCC database is limited to the minimum rights necessary (read/write). By default, the user who executes the WinCC installation and the local administrator are incorporated into this group. Additional members must be added manually by an administrator.
- "SIMATIC HMI Viewer"
These members have read access only to configuration and runtime data in the WinCC database. This group is primarily used for accounts for Web publication services, e.g. IIS (Internet Information Services) account for operation of WinCC WebNavigator.
- Access to folder "<Installation Directory>/WinCC/aplib"
Following installation, the directory "Installation Directory/WinCC/aplib" named "SCRIPTFCT" is unlocked for the "SIMATIC HMI" user group. This directory contains central libraries for project script functions.
- "RTIL Tracing User"
The user group is created during the installation of WinCC. Users in this user group can connect the WinCC project to WinCC Unified via the WinCC Unified channel.

WinCC folder share

With access via folder shares, the folders of a WinCC project are generally read-only.

Access to the WinCC project folders and project data from the network via Microsoft Windows is read-only.

Release project folder for write access

The "SIMATIC HMI" user group needs full access to the project folders of a server in the following cases:

- Access via scripts or open interfaces, e.g. when using WinCC/ODK
- Access via multiuser engineering
- Access of clients with own project
- Integrated projects (SIMATIC Manager)

To enable full access to the WinCC project folders, disable the following option in the "Properties - Project" area of the "Computer" editor:

- Project directory is only shared for read access.

Make sure that full access is restricted to the necessary user groups or users.

You can change the option while runtime is activated.

The change is applied immediately.

User groups and user rights

The following overview contains the tasks of the different user groups with the access rights and instructions required to assign these access rights.

WinCC Installation

- Task: WinCC Installation
- Role: Configuration engineer, Administrator
- Authorization: Microsoft Windows Administrator rights
- Procedure:
Prior to installation, ensure that you have local administrator rights on the computer.
- Explanation:
You need local administrator rights to install WinCC.

Preparation for operation

- Task: Access to WinCC
- Role: Configuration engineer, Administrator
- Authorization: Power user rights, Administrator rights
- Procedure:
After installation, set up the administrative settings as administrator or power user.
- Explanation:
Power user rights are the minimum requirements for administrative settings, e.g. the authorization of file rights or printer driver settings.
To delete a WinCC project completely, you must have power user rights, at a minimum.

Local user rights when operating WinCC

- Task: Operator input in Runtime, configuration
- Role: WinCC user (operator, configuration engineer)
- Authorization:
 - Microsoft Windows "User" group
 - "SIMATIC HMI" user group
- Procedure:
Add the user to the "SIMATIC HMI" user group and, at a minimum, to the Microsoft Windows "User" user group.
- Explanation:
In order to operate WinCC or for remote access to a WinCC project on the client and server, the user must be a member of the "SIMATIC HMI" user group.

Access to distributed systems

- Task: Access to distributed systems
- Role: WinCC user (operator, configuration engineer)
- Authorization: Uniform user groups on all computers
- Procedure:
Enter the WinCC users on all computers in the same group.
Assign the same password to all the users.
- Explanation:
For access to distributed systems, the same user groups must be created on clients and servers.

Access rights for local projects

- Task: Access to projects which were created as follows:
 - Manual copy
 - Duplicate
 - Retrieving
 - Migration
- Role: WinCC user (operator, configuration engineer)
- Authorization: SIMATIC HMI, SIMATIC HMI Viewer
- Procedure:
Assign full access rights to the project folder for the "SIMATIC HMI" group.
To do so, open the project following its creation once as administrator or power user.
Alternatively, you can specify access rights in the Microsoft Windows Computer Management.
Even if you want to copy projects with the Project Duplicator you will need the appropriate authorizations. You will either have to grant access to the used folders or duplicate them as main user.
- Explanation:
When a local project is newly created, the members of user groups "SIMATIC HMI" and "SIMATIC HMI Viewer" automatically receive the necessary access rights to the project directory.
However, when projects are copied, logged, or migrated, the local authorizations are not transferred but must be reassigned.

Access rights to system information

- Task: Access to system information via the "System Info" WinCC channel
- Role: Operator
- Authorization: System monitor users

- Procedure:
Include all those users in the "System monitor users" Microsoft Windows group who require the following system information from the "System Info" WinCC channel:
 - CPU load
 - Status of the export file
- Explanation:
Users with Microsoft Windows standard user rights do not have access to certain system information.

See also

Notes on Data and System Security (Page 27)

How to Adapt the Windows Security Policies (Page 37)

How to install WinCC (Page 39)

WinCC Installation Requirements (Page 18)

Installing WinCC (Page 38)

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Including users in the "SIMATIC HMI" user group

Introduction

Include those local users in the "SIMATIC HMI" group whose login permits access to WinCC.

You must first create local users to do so.

Users of a domain may be directly included in the user group "SIMATIC HMI".

WinCC/WebNavigator: Users of the Web client

When you install the WebNavigator client on the WinCC PC, you must also include the users of the Web client in the user group "SIMATIC HMI" or "SIMATIC HMI VIEWER".

Procedure

1. Open the workstation administration under Microsoft Windows.
2. Select the "Local users and groups > Users" entry in the navigation window.
The data window displays all local users.
3. In the context menu, select the "New User" dialog.
Create a user account for each user who is to have access to WinCC.
4. In the navigation window, select the "Local Users and Groups > Groups" entry.
The data window displays all groups.
Select the group "SIMATIC HMI".
5. Using the shortcut menu, open the "Add Member" dialog and include those users as members of the "SIMATIC HMI" user group.

Including domain-global user group in the "SIMATIC HMI" user group

Introduction

During operation of a domain, an additional domain-global user group may be created and included as a member of the "SIMATIC HMI" user group.

Application example

You can find a detailed application example in the Internet under Entry ID 78346833:

- SiePortal: "Installation and operation of WinCC in a Microsoft domain environment" (<https://support.industry.siemens.com/cs/ww/en/view/78346833>)

Requirements

- The domain administrator creates a domain-global user group.
- Within the domain, the domain administrator includes those users in the domain whose login permits access to WinCC.

Procedure

1. Open the workstation administration under Microsoft Windows.
2. In the navigation window, select the "Local Users and Groups > Groups" entry. The data window displays all groups. Select the group "SIMATIC HMI".
3. Using the pop-up menu, open the "Add Member" dialog and include domain-global user group as members of the "SIMATIC HMI" user group.

See also

SiePortal: "Installation and operation of WinCC in a Microsoft domain environment" (<https://support.industry.siemens.com/cs/ww/en/view/78346833>)

Release existing project for "SIMATIC HMI" user group

Introduction

You must first remove the existing share of the project directory if the user group "SIMATIC HMI" has to access an existing user group.

The project is then released again while opening WinCC Explorer.

Procedure

1. Open the workstation administration under Microsoft Windows.
2. In the navigation window, select the entry "Shared Folders > Shares".
The data window displays all unlocked directories.
3. Select the respective project directory and remove the share by using the "Cancel Share" context menu.
4. If you now open the project in WinCC, the project directory is automatically unlocked for the "SIMATIC HMI" user group, and all members of the user group are granted access to the project directory.

Note

The enable name of the directory shared by WinCC must not be modified.

1.1.6.7 How to Adapt the Windows Security Policies

Introduction

Before you install WinCC, you must check the operating system settings:

- The system must permit the installation of unsigned drivers and files.

Procedure

1. To open the Microsoft Windows entry field, select the entry "Run" in the "Windows System" program group.
2. Enter "gpedit.msc" in the input box.
The "Local Group Policy Editor" dialog box opens.
3. In the left section of the window under "Policy for local computer", select "Computer Configuration > Administrative Templates > System > Device Installation > Device Installation Restrictions".
4. Check the settings of the security policies below:
 - "Display a custom message when installation is prevented by policy (balloon text)"
 - "Display a custom message when installation is prevented by policy (balloon title)""Not configured" must be set for the policy.

See also

Notes on Data and System Security (Page 27)

Defining Access Rights in the Operating System (Page 31)

1.1 WinCC Installation Notes

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1.1.7 Installing WinCC

1.1.7.1 Installing WinCC

Introduction

This section describes the installation of WinCC.

During the WinCC installation, MS Message Queuing and Microsoft Internet Information Service (IIS) are installed and configured if necessary.

Installation of a WinCC file server

If a WinCC server is set up which is to be used for project data archiving only, only the WinCC file server needs to be installed. You can find more information in the WinCC Information System, in the section "Configurations > Fileserver".

Note

Usage only with administrator rights

If you want to use the Fileserver, you need administrator rights.

Fileserver installation requirements

WinCC V8 and WinCC Fileserver V8 cannot be installed at the same time on one computer.

Installation of WinCC Options

The WinCC DVD contains the following options:

- WinCC/Connectivity Pack / Connectivity Station
- WinCC/DataMonitor
- WinCC/WebNavigator
- WinCC/WebUX

These options require their own licenses.

If you purchase a WinCC option at a later date, you will receive the necessary licenses on a license data carrier.

An installation DVD is not supplied. Use the WinCC DVD for installation.

See also

Upgrading WinCC (Page 52)

How to Install Supplementary Components Later (Page 46)

How to install WinCC (Page 39)

Hardware requirements for installing WinCC (Page 19)

WinCC Installation Requirements (Page 18)




Software requirements for installing WinCC (Page 21)

1.1.7.2 How to install WinCC

Introduction

This section describes how to install and run WinCC.

The already installed components are displayed during setup. The following icons are used:

Icon	Meaning
	Current version of program is installed.
	Program is being updated.
	Program setup conditions are not met. Click the icon for details.
<input type="checkbox"/>	Program can be selected.
<input checked="" type="checkbox"/>	Program selected for installation.
<input type="checkbox"/>	Program cannot be selected (due to program interdependencies).
<input checked="" type="checkbox"/>	Program selected for installation (cannot be deselected).

Scope of installation

Installing WinCC options

You can install the desired options during the installation of WinCC itself.

For some options, the documentation only becomes available when the corresponding option package is installed.

1.1 WinCC Installation Notes

Package installation

The following components are installed with the selected program package:

WinCC	<p>WinCC installation</p> <p>The package installs the WinCC server with the following components:</p> <ul style="list-style-type: none"> • WinCC Runtime • WinCC CS (incl. Basic Process Control) • SQL server • OPC server • OPC UA server • OPC UA client • SmartTools • WinCC Unified Collaboration • Automation License Manager <p>WinCC incl. WebUX</p> <ul style="list-style-type: none"> • Additionally installs WinCC/WebUX
WinCC client	<p>WinCC client installation:</p> <p>When you install the "WinCC client" program package, you need an "RT client" or "RC client" client license.</p> <ul style="list-style-type: none"> • WinCC Runtime • WinCC CS (incl. Basic Process Control) • SQL Express • OPC server • OPC UA server • OPC UA client • SmartTools • WinCC Unified Collaboration • Automation License Manager <p>WinCC client incl. WebServer</p> <ul style="list-style-type: none"> • Additionally installs the WebNavigator server
WebNavigator	<p>WebNavigator server</p> <ul style="list-style-type: none"> • WinCC server with the components of the program package "WinCC installation" • WebNavigator server <p>To install further WebNavigator components, activate the component in the "Programs" view, e.g. "Web Plugin Builder" for the installation of the "WinCC Plug-In Builder".</p> <p>WebNavigator client</p> <ul style="list-style-type: none"> • Only installs the WebNavigator client

DataMonitor	<p>DataMonitor server</p> <p>If no WebNavigator server is installed yet, it is also installed with the package.</p> <ul style="list-style-type: none"> • WinCC server with the components of the program package "WinCC installation" • WebNavigator server • DataMonitor server • DataMonitor client <p>To install further DataMonitor components, activate the components in the "Programs" view, e.g. for the installation of "Excel Workbook" and "Excel Workbook Wizard".</p> <p>DataMonitor client</p> <ul style="list-style-type: none"> • Only installs the DataMonitor client
ConnectivityPack	<p>ConnectivityPack server</p> <ul style="list-style-type: none"> • WinCC server with the components of the program package "WinCC installation" • ConnectivityPack server <p>To install further Connectivity Pack components, activate the components in the "Programs" view, for example for the installation of the "Connectivity Station".</p> <p>ConnectivityPack client</p> <ul style="list-style-type: none"> • ConnectivityPack client • SQL Connectivity Components

Custom installation

Select individual components for installation.

The following components are typical examples of additional installations which are not installed with program packages:

- WinCC:
 - WinCC File server (WinCC file server/SQL server)
- WebNavigator:
 - Diagnostics client
 - WinCC Remote Publisher
- Options:
 - SIMATIC Logon
 - AS-OS Engineering

Supplementary installation

You can install or uninstall components and languages at a later stage.

The required disc space depends upon the installed components. An estimated value is shown in the status bar.

1.1 WinCC Installation Notes

More information:

- "How to Install Supplementary Components Later (Page 46)"
- "How to Install Supplementary Languages (Page 47)".

WinCC remote communication

Remote access is disabled by default after installation.

If you use a redundant system or a client-server system, for example, enable the remote communication in the SIMATIC Shell settings.

More information:

- "Notes on Data and System Security (Page 27)"

Requirements

- Make sure that no other setup is running on the PC at the same time, for example, a Microsoft Windows update.
- You need local administrator rights to install WinCC.
Information on the user rights required for operating WinCC:
 - "Defining Access Rights in the Operating System (Page 31)"
- The computer name may only contain permissible characters.
- The security policies must be modified under Microsoft Windows.
- No manually created SQL server instance with the name "WinCC" may be installed.
- Microsoft Message Queuing is installed and configured during WinCC installation.
- The storage medium with the licenses must not yet be connected to the installation PC. You can transfer the licenses during WinCC installation. Alternatively, you can install the licenses before installing WinCC using the Automation License Manager.

WinCC is released for the following operating system languages:

- German, English, French, Italian, Spanish
- Chinese (simplified, PRC), Chinese (traditional, Taiwan), Japanese, Korean
- Multilingual operating system

Note

Unfulfilled requirements

An error message is output if you run WinCC Setup without administrator rights, or if other setup conditions are not met.

You can find more information on error messages here: "WinCC Installation Requirements (Page 18)".

Procedure

1. Start the WinCC product DVD.
 - The DVD starts automatically if Autorun is enabled in the operating system.
 - If the Autorun function is not activated, start the Setup.exe program on the DVD.
Alternatively, start the downloaded setup.
2. Follow the on-screen instructions.
Read and confirm the License Agreement and the Open Source License Agreement.
3. Select "Install" as the setup type.
4. Select the languages you want to install.
You can also install other languages at a later time.
5. Select the desired type of installation:
 - For Package installation, select the "WinCC installation" or "WinCC incl. WebUX" program package.
If you also want to install WinCC options, select the corresponding program packages.
Select "WinCC client installation" or "WinCC client incl. WebServer" if you only want to install the WinCC client.
 - If you use the user-defined installation, select the desired installation scope.
The components to be installed are shown in the "Description" field in each case.
If necessary, change the installation path using the "Browse" button.
6. Check the list of components to be installed in the "Programs" view.
 - If required, activate additional components.
 - Click on "Help" for a description of the displayed icons.
 - When you click on the listed components, information on the installation status of the components may be shown.
 - The content field on the right contains details on the selected component and, at the bottom, the required disc space.
 - You can open the associated documentation for some components with the "Readme" button.
 - The "Storage space" button will show you the available storage space on your PC.
7. Read and confirm the license agreement for the Microsoft SQL Server.
8. Before the installation, the security settings that are adapted for WinCC are displayed in the "System settings" dialog. The firewall is configured automatically.
Confirm the changes to the system settings.
Use the "Save as" button to save the list of changes as a text file "Secon.RTF" in the selected target folder.
9. Start the installation.
You can track the status of the installation in the displayed dialog.
Select "Cancel" to cancel the installation of the current component.

1.1 WinCC Installation Notes

10. You can transfer the product license keys after installing the components.
To do so, click on "Transfer license key".
Select "Next" if you have already transferred the license keys or want to install them at a later time.

Note

Transferring licenses

License keys are not transferred automatically.

Transfer the missing license keys during or after installation with the Automation License Manager.

11. Restart the PC to conclude the installation.

Automatic migration

When you open a project that was created with a previous version of the currently installed WinCC version, the configuration and Runtime data is automatically migrated.

You can convert the pictures and libraries with the Project Migrator or manually via WinCC Explorer.

You can find detailed information on migration in the WinCC Information System:

- "Getting started > Migration (Page 203)"

Entries in the "Siemens Automation" program group

After installing WinCC, you will find new entries in the "Siemens Automation" program group.

- Starting WinCC Explorer:
 - WinCC Explorer
- Editors and tools for working with WinCC:
 - Autostart
 - Channel Diagnosis
 - Cross Reference Assistant
 - Dynamic Wizard Editor
 - Project Duplicator
 - Project Migrator
 - WinCC Certificate Manager
 - WinCC Documentation Viewer
 - WinCC TAG Simulator

- WinCC documentation:
 - Documentation > Manuals

To open the WinCC Online Help and the installed WinCC options, select the "WinCC Information System" link in the language folder.
Print versions of the WinCC Information System:

 - PDF files in the installation path under "WinCC > Documents"
- License management:
 - Automation License Manager
 - License Analysis
- Security Controller for displaying the customized security settings:
 - Security Controller
- Overview of the installed SIMATIC software and components:
 - Inst. Software
- Editors and tools for working with the supplied WinCC options:
 - PdIPad
 - PublishingWizard
 - Web Navigator Plug-In Builder
 - WinCC Archive Connector
 - WinCC DataMonitor Configurator Export
 - WinCC Web Configuration Center
 - WinCCViewerRT

The entries depend on the installed options.

See also

Upgrading WinCC (Page 52)
Notes on Data and System Security (Page 27)
Defining Access Rights in the Operating System (Page 31)
How to Adapt the Windows Security Policies (Page 37)
How to Install Supplementary Components Later (Page 46)
WinCC Installation Requirements (Page 18)
Hardware requirements for installing WinCC (Page 19)
Software requirements for installing WinCC (Page 21)
Installing WinCC (Page 38)
Introduction (Page 203)
How to Install Supplementary Languages (Page 47)

1.1.7.3 How to Install Supplementary Components Later

Introduction

Once you have installed WinCC, you can then install further components or options at a later date.

Installation of WinCC Options

The WinCC DVD contains the following WinCC Options:

- WinCC/Connectivity Pack / Connectivity Station
- WinCC/DataMonitor
- WinCC/WebNavigator
- WinCC/WebUX

These options require their own licenses.

If you purchase a WinCC option at a later date, you will receive the necessary licenses on a license data carrier. An installation DVD is not supplied.

Use the WinCC DVD for installation.

Procedure

1. Start the WinCC product DVD.
If the Autorun function is not activated, start the program Setup.exe on the DVD.
2. Specify whether you wish to install individual components or options. The already installed components will be displayed.
3. Follow the on-screen instructions.

Installation path of SmartTools

Run the SmartTools setup from the following path on your WinCC DVD:

- "Instdata\Smarttools\Setup\Setup.exe"

See also

WinCC Installation Requirements (Page 18)

How to install WinCC (Page 39)

Upgrading WinCC (Page 52)

How to Install Supplementary Languages (Page 47)

1.1.7.4 How to Install Supplementary Languages

Introduction

Once you have installed WinCC, you can later install additional languages.

Procedure

1. Open the "Programs and functions" or "Programs and features" entry in the control panel.
2. Select "SIMATIC WinCC Runtime <Version>" and click the "Change" button.
The WinCC Setup program opens.
3. Select your desired languages.
4. When prompted, insert the WinCC product DVD in the DVD drive.
If the home page of the DVD is opened via the Autorun function, close the window with "Exit".
5. Follow the instructions on the screen.
6. If you have installed WinCC CS, select "SIMATIC WinCC Configuration <Version>" and click the "Change" button.
Repeat steps 3 to 5 for WinCC CS.
Repeat this procedure for any additionally installed components and options.

See also

How to Install Supplementary Components Later (Page 46)

How to install WinCC (Page 39)

1.1.7.5 Configure automatic installation of WinCC

The "Central installation" function

Configuring automatic installation

To install WinCC on multiple PCs, use a central installation.

Central setup storage: Note the path length

When you store the setup at a central location and launch it from a network drive, use the shortest possible folder names.

The path length of the drive name, file folder and setup files may be no longer than 255 characters.

Record function

The Record function supports multiple installation on different computers with identical options.

1.1 WinCC Installation Notes

During setup, the Record function records the settings and creates a "Ra_Auto.ini" installation file which supports you during installation.

While in the past you had to navigate through all setup dialogs for each installation, all you have to do now is start setup with the "Ra_Auto.ini" control file.

Conditions for using the record function

- Central installation is only possible for the respective setup version that is available at the time.
A central installation of WinCC has no effect on the subsequent installation of updates or options.
- The "Expert mode" scope of installation cannot be used for automatic installation.
In Expert mode, the installation dialog is opened for each product even when you have saved the installation settings with the Record function.

Overview of the procedure

The following steps are required for a central installation:

1. Call the Record function and create the "Ra_Auto.ini" control file.
2. Start central installation.

WinCC/WebNavigator: Installation without user interaction

For a central installation on a web client start the setup via the following command line:

- Installation with default settings:

```
msiexec /i C:\TEMP\WebnavigatorClient.msi /quiet /log  
C:\temp\installWebNav.log
```
- Installation with reduced user interface:

```
msiexec /i C:\TEMP\WebnavigatorClient.msi /qb /log  
C:\temp\installWebNav.log
```

More information:

- Installing the WebNavigator client (Page 119)

Calling the Record function of the central installation

You use the Record function to create the "Ra_Auto.ini" control file which includes all information for the central installation.

Dependency on operating system

Run the central installation for each operating system version separately.

The control file can only be executed on PCs on which the same operating system version is running. During installation of WinCC, Microsoft updates are installed, for example, which depend on the installed operating system.

Scope of installation for automatic installation

The "Expert mode" scope of installation cannot be used for automatic installation.

Select one of the other available installation methods, e.g. "Standard" or "WinCC Client".

Requirement

- You need administrator rights on your PC.

Procedure

1. To open the Microsoft Windows entry field, select the entry "Run" in the "Windows System" program group.
2. Enter the following command line:

```
- <Path for the installation data>\setup.exe /record
```

Select the DVD drive or a central PC to which the installation data were copied as path for the installation files.
Setup is started.
3. Select the desired language and click "OK".
The "Record function" dialog is displayed.
4. Activate the Record function.
5. Select the path in which you want to create the "Ra_Auto.ini" control file and confirm with "Next".
6. Select the required components and settings for the installation.
Once you have made the settings, the message "Recording completed" is displayed.

Result

The control file "Ra_Auto.ini" is created and saved in the selected path.

The same setup version must be used for central installation and for creation of the "Ra_Auto.ini" file.

Start central installation

For central installation on the PC of your WinCC system, start an automatic installation.

The settings of the "Ra_Auto.ini" control file are applied in the process.

Requirement

- You have created the "Ra_Auto.ini" file using the Record function.
The file "Ra_Auto.ini" must be created with the existing setup version.
- The same operating system version is installed on the PC.

1.1 WinCC Installation Notes

Procedure

1. If required, copy the setup to a central server or PC.
2. Copy the file "Ra_Auto.ini" to the folder "C:\Windows" on the PC to be installed.
3. Start central installation by calling automatic installation:

– <Path for the installation data>\setup.exe /silent

You may receive a message when the central installation was completed successfully.

Note

If an error or inconsistency occurs during installation, you will receive messages that require your acknowledgement.

4. Repeat this process for each required computer.

Alternative procedure

If the file "Ra_Auto.ini" is not located in the "C:\Windows" folder, start central installation with the following call:

- <Path for the installation data>\setup.exe /silent=<storage path>\Ra_Auto.ini

1.1.8 Uninstalling WinCC

Introduction

On your computer, you can remove WinCC completely or simply remove individual components. You cannot remove individual languages.

You can execute the removal via the WinCC product DVD or vial the control panel of the operating system.

Procedure: Uninstalling via the WinCC Product DVD

1. Start the WinCC product DVD.
The DVD starts automatically if Autorun is enabled in the operating system.
If the Autorun function is not activated, start the Setup.exe program on the DVD.
2. Follow the on-screen instructions.
3. Select "Remove" as the setup type.
4. Select the components that you want to remove.

Alternative procedure: Uninstalling via the Control Panel

1. Open the "Uninstall or change a program" dialog in the Microsoft Windows Control Panel.
2. Select the desired entry.
The installed WinCC components always start with "SIMATIC WinCC".
3. Choose the "Uninstall" or "Change" option from the shortcut menu.
Remove any WinCC options that may have been installed before you remove the WinCC version.

Microsoft SQL Server

After uninstalling WinCC, you must uninstall the Microsoft SQL Server instance "WinCC":

In the "Uninstall or change programs" dialog, select the entry "Microsoft SQL Server <Version>" to uninstall.

The use of Microsoft SQL Server is only permitted if you have a valid license.

Automation License Manager / MS Update

When WinCC is removed, the following programs remain installed, as they may be needed by other SIMATIC products:

- Automation License Manager
- MS Update V1.0 SP1

If, after removing WinCC, you want to install an earlier version of WinCC, you need to remove both of these programs:

Select the respective entry for removal in the "Uninstall or change a program" dialog.

Removal when the WebNavigator client is installed

If you remove WinCC from a computer on which the WebNavigator client is installed, you must then reinstall the WebNavigator client.

Changing the settings in the Microsoft Windows Event Viewer

When WinCC is installed, the WinCC Setup program changes the settings of the Event Viewer.

- Maximum Log Size (System Log/User Log):
1028 KB
- Log Continuation (System Log/User Log):
"Overwrite events"
(Default setting: Overwrite events that are older than 7 days)

After removing WinCC, these settings are not reset.

You can modify these settings in the Microsoft Windows Event Viewer yourself.

1.1.9 Upgrading WinCC

1.1.9.1 Upgrading WinCC

Introduction

As of version WinCC V7.4 SP1, you can upgrade to the current WinCC version V8.x by means of an upgrade installation. Make sure that the latest WinCC updates for the respective WinCC version have been installed.

Proceed as described in "Upgrading an installation" section.

Note

Restart PC before installing the update

Restart the PC before starting the update installation.

Requirements for the upgrade

If you are upgrading WinCC versions prior to V7.0 SP3, observe the operating system requirements and hardware requirements.

More information on migration of WinCC versions V4 or higher is available under the following URL (entry ID=44029132):

- SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/ww/en/view/44029132>)
-

Information on migrating projects

WinCC projects > WinCC V7.4 SP1

No migration is required for projects created with WinCC as of V7.4 SP1. You only have to convert the project data.

To convert the project data select the menu command "Tools > Convert Project Data" in the WinCC Explorer.

WinCC projects < WinCC V7.4 SP1

When you open a project of a previous < V7.4 SP1 version with the current WinCC version, you will be prompted to migrate the project. However, you may also use WinCC Project Migrator to migrate several WinCC projects in a single step.

You still have to make some project settings after migration.

For more information about migrating projects see the "Migration (Page 203)" section.

Note**WinCC user no longer needs to be a member of the "SQLServerMSSQLUser\$<COMPUTER NAME>\$WINCC" user group**

When you migrate projects created prior to WinCC V7.2, you remove the WinCC users from this group.

In WinCC projects prior to V7.2, you will find the user group under the name "SQLServer2005MSSQLUser\$<COMPUTER NAME>\$WINCC".

Notes on licensing

Licenses from previous WinCC versions must be upgraded to the current version.

You can update the licensing retroactively. Detailed information is available in the WinCC Information System under the topic "Licensing".

See also

How to Perform an Upgrade Installation (Page 53)

Introduction (Page 203)

SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/ww/en/view/44029132>)

1.1.9.2 How to Perform an Upgrade Installation**Introduction**

If you currently have WinCC V7.4 SP1 or higher installed on your system, you can perform an upgrade installation. Make sure that the latest WinCC updates for the respective WinCC version have been installed.

Before beginning an upgrade installation, the transfer of existing projects must be prepared.

Requirement

The hardware configuration of previous versions is sufficient in most cases to install an upgrade to the current WinCC version V8.x.

However, performance is reduced if the amount of data is increased too much.

1.1 WinCC Installation Notes

If it is expected that the data volume will increase, upgrade the hardware in good time.

Note

Requirements for the upgrade

If you are upgrading WinCC versions prior to V7.0 SP3, observe the operating system requirements and hardware requirements.

More information on migration of WinCC versions V4 or higher is available under the following URL (entry ID=44029132):

- SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/ww/en/view/44029132>)

Upgrade preparation

Note

Backing up a WinCC project

Make a backup copy of your project before upgrading WinCC.

Restart PC before installing the update

Restart the PC before starting the update installation.

Additional steps and adjusting settings

Also read the notes in the WinCC Information System under "Migration".

Check the special characters

Before performing an upgrade installation of WinCC, check the existing projects with regard to special characters used in the archive names, archive tag names, trend names, trend window names, column names and table window names.

You will find a table with the permitted special characters in the section "Working with WinCC > Working with Projects > References".

It is possible that you must use Tag Logging in WinCC V6.2 SP3 or V7.0 to remove certain special characters from the names.

NOTICE
Transferring archives with impermissible special characters
When transferring archives, if they contain impermissible special characters, the runtime archive may be lost.

Modified standard functions (ANSI-C)

If modified standard functions (ANSI-C) are used, make backup copies of the functions prior to the upgrade installation.

During the WinCC installation process, these functions are overwritten by the standard functions supplied.

Procedure

1. Prepare existing WinCC projects for migration.
Check the used names for impermissible special characters.
2. Install the current WinCC version.
Proceed as described in the section "How to install WinCC".
You will need the storage medium that contains the licenses for the current WinCC version.
Upgraded licenses of previous WinCC versions will be lost.
3. Migrate your existing WinCC projects.
Note the corresponding "First Information > Migration" section in the WinCC Information System.

See also

How to install WinCC (Page 39)

WinCC Installation Requirements (Page 18)

Installing WinCC (Page 38)

Introduction (Page 203)

How to migrate the WinCC data (Page 214)

SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/ww/en/view/44029132>)

1.1.10 Overview: Notes on operation

Introduction

For trouble-free operation and optimal performance of WinCC, observe the notes on operation under Microsoft Windows and the notes on configuration.

You can find this information in the following sections of the WinCC Information System:

- "Release Notes > Notes on operation (Page 57)"
This section includes information on compatibility and on use of virus scanners.
- "Release Notes > Notes on WinCC > Remote access and Remote Desktop Protocol (RDP) (Page 83)"
The section contains information about remote communication.
- "Working with WinCC > Working with Projects > Making Settings for Runtime > Effect of External Applications at Runtime"
This section contains information on applications that can affect system resources.
- "Working with WinCC > Working with Projects > Making Settings for Runtime > System diagnostics with performance tags"
The section contains information on system tags with which, for example, the time behavior during reading or writing of tags is analyzed.

1.1 WinCC Installation Notes

- "Working with WinCC > Configuration recommendations"
The section contains information on the high-performance configuration of process pictures and on the optimal dynamization of picture objects and controls.
- "Configurations > Multi-User Systems > Quantity structures and performance"
The notes on configuration in this section apply to all project types.

1.2 WinCC Release Notes

1.2.1 Release Notes

Content

These Release Notes contain important information.

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

Please read these Release Notes carefully since it contains information which may prove helpful.

1.2.2 Notes on operation

1.2.2.1 Notes on operation

General information

Avoiding loads from external applications

If several programs are run simultaneously on the same computer, the computer may be exposed to high load levels.

To ensure trouble-free WinCC operations do not run any other applications that can lead to a resource crunch on the PC. Therefore, close any unnecessary programs before starting WinCC. More information is available in the section "Working with Projects > Making Runtime Settings > Impact of External Applications on Runtime".

System diagnostics with performance tags

You can analyze the time behavior, e.g. during reading and writing of data, with the system tags of the "Performance" tag group.

Feedback and user data statistics (telemetry)

WinCC collects and processes license information and statistical usage and diagnostic data like quantity structures or the frequency of use of specific functions in order to keep WinCC safe and up to date, to detect and diagnose problems and to implement product improvements.

The anonymized usage and diagnostic data is initially saved on your local computer in readable form where you can view it.

Storage path:

- ...\\ProgramData\\Siemens\\Automation\\TelemetryConnector\\EventPersistence

The usage and diagnostic data is then also transferred to Siemens via a secure communication channel for the above-mentioned purposes.

You can deactivate this function via the project settings at any time.

Compatibility

You can find information on compatibility on the Internet in FAQ No. 64847781:

- SiePortal: FAQ 64847781 (<https://support.industry.siemens.com/cs/ww/en/view/64847781>)
- Compatibility tool for automation and drive technology: (<https://support.industry.siemens.com/kompatool/index.html?lang=en>)

Using virus scanners

The following virus scanners have been approved for use as of WinCC V8.1:

- Symantec Endpoint Protection V14.3 RU9 (Norton Antivirus)
- McAfee Endpoint Protection Suite V10.7
- Trellix Endpoint Security 10.7 (McAfee)
- Trellix Application Control 8.4 (McAfee)
- TXOne StellarProtect 3.0
- Windows Defender (version contained in the operating system)

You can find updated information on the approved virus scanners in the compatibility tool under "More products > Virus scanners".

Fundamental principle

The use of a virus scanner should not hamper the runtime process in a plant.

Rules for local virus scanners (virus scan clients)

- Integrated firewall of the virus scanners
The used local Windows Firewall is configured in WinCC V8.x using SIMATIC Security Control. You may not install or activate the integrated Firewall of the virus scanners.
- Manual scan
You are not permitted to run a manual scan in Runtime. Run this scan at regular intervals on all system PCs, for example, during a maintenance interval.
- Automatic scan
With an automatic scan it is sufficient to scan the incoming data traffic.
- Time-controlled scan
You are not permitted to run the time-controlled scan in Runtime.
- Pattern update
The pattern update of virus scan clients (system PCs being checked for viruses) is done by the higher-level virus scan server (the system PC that centrally manages the virus scan clients).
- Dialogs
To avoid interfering with the process mode, no dialog messages should be displayed on the virus scan clients.

- Drives
Only the local drives are scanned to prevent overlapping scans on network drives.
 - You can deactivate email scan except on the WinCC engineering station that receives email.
- Accept all other default settings.

What does this ensure?

The incoming data traffic is checked for viruses. The effect on process mode is kept to a minimum.

Note

When using a virus scanner, make sure that the computer has sufficient system resources.

Screen savers

Using a screen saver costs processor time and can lead to a system overload. Screen savers that do not release portions of the work memory no longer needed continually reduce the usable work memory.

The Microsoft Windows "Logon screen saver" can be used.

See also

Software requirements for installing WinCC (Page 21)

SiePortal: FAQ 64847781 (<https://support.industry.siemens.com/cs/ww/en/view/64847781>)

Compatibility tool for automation and drive technology: (<https://support.industry.siemens.com/kompatool/index.html?lang=en>)

1.2.2.2 Information on the Microsoft Windows operating system**Microsoft security updates and patches**

Make sure that all current patches and security updates from Microsoft are installed on your computer.

For more information, refer to the FAQs in the SIMATIC Customer Online Support:

- SiePortal: FAQ 18752994 (<https://support.industry.siemens.com/cs/ww/en/view/18752994>)
- SiePortal: FAQ search (<https://support.industry.siemens.com/cs/products?search=microsoft&dtp=faq&mf=ps&o=DefaultRankingDesc&pnid=14866&lc=en-WW>)

General information

WinCC interface and 64-bit operating system

The public interface of WinCC offer no native 64-bit support. This primarily affects ODK, VBS and the WinCC OLEDB provider.

To use the WinCC interfaces under a 64-bit operating system, the following applies:

- You cannot launch VB scripts simply with a double-click.
You must explicitly use the 32-bit version under "syswow64\wscript.exe".
- .NET applications that use the WinCC API must be explicitly compiled as 32-bit applications.
With "x86" and not with "AnyCPU".
- C++ applications cannot be compiled as 64-bit applications.

Preventing access to Microsoft Windows in runtime

Displaying the online help in runtime

If you wish to ensure that operators have no access to the operating system level of a plant, deactivate online help in all controls. This prevents the Microsoft Windows selection dialog from opening.

For this purpose, deactivate the "Help available in Runtime" option under "Options" in the "Properties - Project" area of the "Computer" editor.

Displaying the Microsoft Windows taskbar in runtime

You can use the computer properties to prevent the Windows taskbar from being displayed in runtime:

- Activate the "Disable keys" option under "Parameters" in the "Properties - Computer" area of the "Computer" editor.
This disables all shortcut keys for operating system access.
- Disable the "Keep the taskbar on top of other windows" setting in Microsoft Windows or enable the options for hiding the taskbar.

If you disable the <CTRL+ESC> shortcut key, the following shortcut keys are also disabled in runtime:

Key combination	Function
<Windows key+U>	System utility program manager
Press <SHIFT> five times	Locking function
Press <SHIFT right> for eight seconds	Impact delay
<ALT left+SHIFT left+NUM>	Keyboard mouse
<ALT left+SHIFT left+PRINT>	High contrast

These functions can be configured using the Microsoft Windows Control Panel.

If the functions are activated in the Windows Control Panel before activating WinCC Runtime, they are no longer locked in runtime.

By activating the option "Disable shortcut keys for operating system access", you are also disabling the shortcut keys for easier operation.

Do not use the "On-screen Keyboard" that can be enabled in Microsoft Windows

Use the virtual keyboard offered by WinCC instead of the "On-Screen Keyboard" enabled by Windows to prevent the display of the Windows taskbar in Runtime.

Keyboard with multimedia keys

Do not use keyboards that support additional multimedia keys (AppKeys).

If you are using a keyboard with multimedia keys for a good reason, disable the corresponding registry keys in the following paths:

- All Microsoft Windows users:
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Explorer\AppKey<XX>
- Local Microsoft Windows user:
HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\AppKey<XX>

Disable the "REG_SZ" entries for multimedia buttons in the numbered folders.

The value of the registry entry must not be set.

NOTICE

Registry change

Create a backup copy of the registry before you edit the registry.

You can find more information on creating a backup copy, restoring and editing the registry in the Microsoft Knowledge Base under article no. 256986 (<https://learn.microsoft.com/en-us/troubleshoot/windows-server/performance/windows-registry-advanced-users>).

Incorrect use of the Registry Editor can cause serious problems that affect the entire system and require reinstallation.

Use the Registry Editor at your own risk.

Do not specify print to file as standard printing

Do not set print to file as standard printing procedure in the Microsoft Windows operating system.

This prevents the Windows dialog for saving the file from opening when printing from WinCC.

"Hardcopy" function

If the shortcut keys are disabled via the option "Disable shortcut keys for operating system access", the hardcopy function only prints to physically connected printers.

No printout is possible on printers with the "Print to file" function, e.g. save as PDF file. The hardcopy function is not performed for these printers.

If several printers are connected and the configured default printer enables the "Print to file" function, the next physically connected printer in the printer list is used instead of the default printer.

Suppressing Microsoft Windows notifications and alarms in Runtime

To prevent the display of Windows notifications and Windows alarms on a PC in Runtime, follow these steps:

1. Enter "Notifications and actions" in the search field of the Windows taskbar.
The settings for Microsoft Windows notifications and actions open.
2. Click "Notification wizard settings".
3. Select the following settings in the notification wizard:
 - Select the "Alarms only" option.
 - Under "Automatic rules", disable the "When I'm using an app in full-screen mode/Alarms only" option.

WinCC WebBrowser Control: Disabling the shortcut menu

You can restrict the shortcut menu of the WinCC WebBrowser Control in runtime:

- To reduce the shortcut menu to "Forward" and "Backward" navigation, activate the object property "UseSimpleContextMenu" in the Graphics Designer.
- To suppress the shortcut menu completely, disable the Microsoft Windows Group Policy: To open the Microsoft "Group Policy Object Editor", enter "Gpedit.msc" in the search field. Disable the shortcut menu in the Group Policy "User configuration\Administrative templates\Windows components\Internet Explorer\Browser menus".

Warnings with the DCOM configuration

When the "Dcomcnfg.exe" program starts, there may be warnings about unregistered AppIDs of WinCC components.

This reaction has no effect on the functional capability of the software. The warnings can be ignored.

Changing the screen settings

Changing the color palette

If you change the color palette via the Microsoft Windows Control Panel, you should expect color changes and poorer legibility of the text.

When creating the project, therefore, be sure use the same color palette that will be used in runtime.

Changing the resolution

In order to use a different resolution in the destination system, use the "Adapt Picture" or "Adapt Size" functions for pictures and windows.

These settings can lead to blurred displays in runtime and increased system loads.

Operating system with multilanguage installation: wrong language in message boxes

In message boxes in which the user must respond with Yes/No, OK/Cancel, etc., the buttons are always labeled in English in both CS and RT.

This characteristic is independent of both the operating system language set and the WinCC language.

Novell Netware clients

WinCC should not be installed on a system together with the Novell client software.

The installation of WinCC can have the effect that it is no longer possible to log on to the Novell system or the lock the keyboard during runtime.

We recommend you not use the Netware client software or use the Microsoft client for Netware.

Notes on Internet Explorer

Web client: Display of ActiveX controls in Internet Explorer

ActiveX controls are disabled in Internet Explorer by default. For this reason, the WinCC controls are not displayed correctly in Internet Explorer on a Web client.

To display the WinCC controls correctly, add the Web server as a trusted website and enable the ActiveX controls only for the "Trusted sites" zone.

To continue protecting Internet Explorer from foreign ActiveX controls, check that the restricted security settings still apply to the other zones after making the changes.

For more information, refer to the following documentation:

- WinCC/WebNavigator: "WinCC/WebNavigator Installation Notes > Installation of WebNavigator Client > Settings in Internet Explorer"
- WinCC/DataMonitor: "WinCC/DataMonitor Documentation > Configuring the DataMonitor System > Working with the DataMonitor Client > Configuring Security Settings in Internet Explorer"

Internet Explorer: Setting for WinCC without Internet connection

Disable the option "Check for publisher's certificate revocation" on the "Advanced" tab in the Internet Options if you operate WinCC on PCs that do not have an Internet connection.

See also

Notes on Data and System Security (Page 27)

SiePortal: FAQ 18752994 (<https://support.industry.siemens.com/cs/ww/en/view/18752994>)

SiePortal: FAQ search (<https://support.industry.siemens.com/cs/products?search=microsoft&ntp=faq&mfn=ps&o=DefaultRankingDesc&pnid=14866&lc=en-WW>)

SiePortal: WinCC FAQs (<http://support.automation.siemens.com/WW/view/en/10805583/133000>)

1.2.2.3 Information on the database system

Information on DB.dll

DB.dll is an ODK component for accessing databases via C API functions.

This functionality is no longer supported when using WinCC. Do not develop any new applications with the WinCC database access layer DB.dll.

Instead, use the following functions offered by Microsoft:

- Use ADO.NET for .NET-based applications.
The database interface of the .NET Framework is object-oriented and designed for scalable applications. The interface is also well suited for data communication through firewalls.
- You can use OLE DB for C++ based applications.
Microsoft provides templates with Visual Studio for this. They make it easier to use the OLE DB database technology with classes, which implement many commonly used OLE DB interfaces.
- You can also use ODBC C++ based applications.
Microsoft provides classes for this, which facilitate programming.

You can find more detailed information and examples on the Microsoft website.

Notes on Microsoft SQL Server

Error accessing the SQL master database after switching off the server while the system is running

If a server fails unexpectedly in runtime (power failure, disconnection of power plug), the WinCC installation may be corrupted as a result and the SQL server will no longer be able to access the SQL master database following a restart.

Access is only possible after reinstalling the WinCC instance.

To reinstall the WinCC instance, you must uninstall and reinstall both WinCC and the Microsoft SQL Server.

Improved access protection for the WinCC databases

For the purposes of improved access protection, the user names "WinCCAdmin" and "WinCCConnect" have been removed from the WinCC database.

Access to the WinCC database is no longer possible using these user names. Applications which use their own SQL user names with password are not affected.

The user "SA" (system administrator) of the SQL server is deactivated during the installation.

Stability of the SQL server: Configuring the MemToLeave parameter

If the SQL server goes offline sporadically, configure the MemToLeave parameter:

1. Close WinCC.
2. Open the SQL server configuration manager.
3. Under "SQL server services" select the entry "SQL server (WinCC)".
4. To open the property dialog, select the "Properties" option from the context menu.
5. Add the following entry on the "Start parameters" tab:
 - -g1024
6. Start WinCC.

Manual detachment of WinCC project databases

Due to a system property in Microsoft SQL Server, the NTFS authorizations may be changed when detaching from the WinCC project databases.

If a WinCC database remains attached after you have closed a WinCC project or if you have manually attached the WinCC database, it is necessary to use the CCCleaner to detach the database.

The "CCCleaner" program is located in the "bin" folder of the WinCC installation directory and must be started as administrator.

1.2.2.4 Information on network technology and UPS

Information on networks

WinCC only supports the TCP/IP network protocol on the terminal bus.

Operation on network servers

It is not permitted to operate WinCC on network servers (e.g. domain controllers, file and name utility servers, routers, software firewalls, media servers, exchange servers, etc.).

Operation on systems with Microsoft Windows cluster technology

WinCC cannot be operated on systems with Microsoft Windows Cluster technology.

Use of redundant servers

When redundant pairs of servers are implemented, the master and standby server must be operated in the same IP/subnet band.

Network adapters with energy-saving mode

When using network adapters provided with energy-saving mode, the energy-saving mode must not be activated.

Operation with multiple network adapters

If WinCC is used on a PC with more than one network adapter, observe the following:

Select the IP addresses which WinCC should use for communication with other WinCC stations. In Microsoft Windows Explorer, select the "Simatic Shell" directory. Click into the navigation window of the dialog "Simatic Shell" and select "Settings..." in the shortcut menu. In the "Settings" dialog that follows, select the IP address to be used.

If problems occur with the configuration and project management despite this setting, it could be due to the assignment of the IP address by the DHCP server to the WinCC station being too slow. In this case, the network administrator must define the IP address for each network adapter on the WinCC station causing the problem.

To do this, press the Microsoft Windows "Start" button and select "Settings" > "Control Panel". Open the "Network Connections" folder and then the "LAN Connection" dialog. Click "Properties" in the "General" tab. Open the "LAN Connection Properties" dialog and select the "Internet Protocol (TCP/IP)" element from the list in the "General" tab by double-clicking it. Use the "Use the following IP address" option button in the properties of Internet Protocol (TCP/IP) to define the IP addresses.

Observe the information in the following chapter: "Special features for communication with a server with multiple network adapters"

Network environment and network drives

Ensure that there are no unnecessary network drive connections.

In order to prevent delays following a restart of a distributed system, start the multi-user projects first. The reason for this is the reaction of the master browser service (responsible for displaying the network environment in the operating system) and administration of the domains and working groups.

Operation with TCP/IP protocol

If the TCP/IP protocol is installed, the IP address must be valid and must not change in runtime operation.

Observe the following here:

1. The IP address becomes invalid when the network adapter is removed or deactivated after installation of the TCP/IP protocol.
2. The IP address may not be initialized yet. This occurs, for example, when the TCP/IP protocol is installed with the IP address derived from a DHCP server. When the computer is connected to the network, the computer undergoes a basic initialization during which an IP address is transferred. This IP address then remains valid even after the computer is disconnected from the network. After the period of the lease has expired, however, it can become invalid or changed in another way.

If the computer is not connected to the network, the user must log on via a user configured locally on this computer. This user should have local power user rights for runtime operation and for the configuration.

Leading zeros in IP addresses

When multi-user mode is used with name derivation via "hosts" and "lmhosts", no preceding zeros may be entered in the "hosts" file. IP addresses with leading zeros are interpreted as OCTAL instead of DECIMAL.

Example:

- Computer_1 199.99.99.020 is interpreted as 199.99.99.16 (decimal)
- Computer_2 199.99.99.026 is interpreted as 199.99.99.22 (decimal)

The specification can also be made hexadecimal:

- 199.99.99.0x10 for Computer_1

Using WinCC in multiple domains

The correct functioning of WinCC can only be guaranteed when all the computers in a multi-user system are located in a common domain or working group. When WinCC is used in different domains or working groups, complications may arise if the access rights and/or name utility are configured incorrectly.

When the user administration is realized in a working group, all the WinCC users must be set up on all the computers in the multi-user system and have the necessary access authorization.

Application example

You can find a detailed application example in the Internet under Entry ID 78346833:

- SiePortal: "Installation and operation of WinCC in a Microsoft domain environment" (<https://support.industry.siemens.com/cs/ww/en/view/78346833>)

Use of WinCC within a domain

If problems occur in accessing the Microsoft Windows domains, it cannot be guaranteed that WinCC functions correctly. Therefore, in addition to a "server-stored user profile", a local user profile and local user with necessary rights for WinCC must be set up. If access problems occur with a domain logon, exit WinCC and log on again using the local user profile.

Application example

You can find a detailed application example in the Internet under Entry ID 78346833:

- SiePortal: "Installation and operation of WinCC in a Microsoft domain environment" (<https://support.industry.siemens.com/cs/ww/en/view/78346833>)

Operation in domains with deactivated NTLM protocol

If the NTLM protocol is deactivated for the domains, you can operate WinCC through the use of the Kerberos protocol.

Information for using routers and firewalls

Using routers

With WinCC V7/V8, it is also possible to connect WinCC clients to WinCC servers via routers.

WinCC clients without their own project cannot be used for configuration with the routers, only for WinCC Runtime. There are no restrictions for WinCC clients with their own project.

The following is required when using routers:

- WinCC must use the correct IP address of the WinCC stations.
- The WinCC stations must be capable of resolving the physical computer name (NETBIOS name) of the other computers in the WinCC project.
- The WinCC stations must be capable of reaching each other via TCP/IP and ICMP without any problems. When testing the connection using Ping, it must be possible to access the computers immediately.
- Activate multicast forwarding to the network routers between the servers and the clients.

Speed of the network connections

For slow network connections, we recommend:

- Restricting the quantity of data to be transferred, for example, by avoiding complicated graphics.
- Using the local pdl cache of the WinCC client.
- Using the ISDN router for a WinCC client in multi-link mode (channel bundling). Bandwidths below 128 Kbps have proved insufficient.
- Integrate only one WinCC client for each additional ISDN channel.
- The operation of WinCC via ISDN routers depends on the stability and availability of the ISDN network.
- Reserve the maximum bandwidth of the connection for WinCC.

Note

Connection via ISDN and operation using slow connections has not been approved for clients without a local project.

Connecting to an office network with a central firewall

Some network configurations can increase the load on the firewall.

You can avoid the described reaction by assigning unique IP addresses to all WinCC stations.

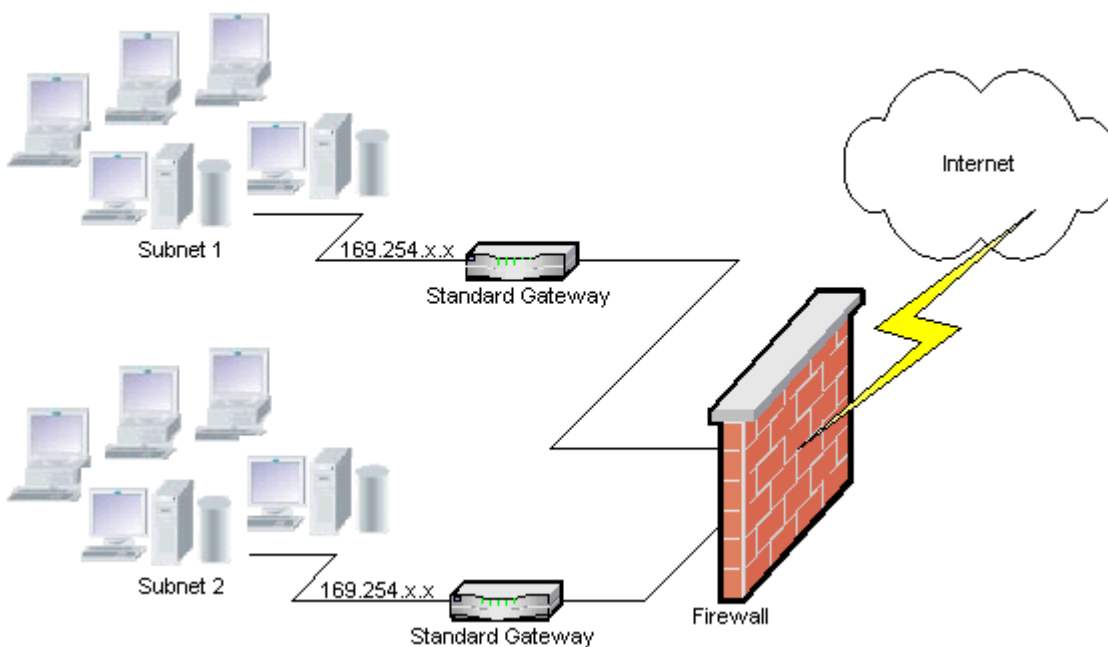
Basic system characteristics

- With a standard installation of Microsoft Windows, the computer is assigned a random IP address from the DHCP server.

Requirements

The following conditions can lead to undesirable reactions when operating WinCC:

- The IP address band used in the terminal network is higher than the APIPA address band (169.254.x.x).
- IP addresses are routed via the default gateway.
- IP addresses from the APIPA band are routed to the firewall.



Cause of the increased load at the firewall

Following a system startup, each WinCC station sends its IP address once to all the other WinCC stations in the network. The WinCC stations define the WinCC station with the lowest IP address as the server that coordinates availability of the project.

If a WinCC station does not receive an address from the DHCP server and is therefore missing in the APIPA process, this station becomes the coordinating server. As a result, all the other WinCC stations attempt to access this server cyclically to publish the project.

The coordinating server, however, cannot be addressed because the IP address from the APIPA band is automatically transferred to the firewall. This also causes an increased network load at the central firewall.

Solution

This reaction can be avoided by assigning a unique IP address to each WinCC station.

Information on uninterruptible power system

Prevent damaged files during power outages

If a power failure occurs while using Microsoft Windows systems when the WinCC system is active, files can be corrupted or lost.

Operation using the NTFS file system offers more security.

Secure continuous operation can only be guaranteed when an uninterruptible power system (UPS) is used.

Uninterruptible power system for client-server systems

If the server in a client-server system should be buffered by an UPS system, it must be capable of bridging a power failure for up to 30 minutes. This value depends on the configuration and number of computers, especially in a multi-user system. A great deal of time is required for the configuration.

See also

SiePortal: "Installation and operation of WinCC in a Microsoft domain environment" (<https://support.industry.siemens.com/cs/ww/en/view/78346833>)

1.2.3 Notes on WinCC

1.2.3.1 General information on WinCC and configurations

General information

WinCC Demo project

WinCC demo projects for WinCC V7/V8 can be downloaded from the Internet:

- SiePortal: WinCC demo projects (search) (<https://support.industry.siemens.com/cs/products?search=demo&ctp=ExampleOfUse&o=DefaultRankingDesc&pnid=14867&lc=en-WW>)
- SiePortal: WinCC V8.0 demo project (download, entry ID 109823232) (<https://support.industry.siemens.com/cs/ww/en/view/109823232>)
Requirement: WinCC V8.0 Update 2
The demo project was created with WinCC V8.0 Update 2. Install Update 2 or a more recent update of WinCC V8.0 from the download page:
SiePortal: Updates for WinCC 8.0 and WinCC V8.0 ASIA (downloads, entry ID 109818723) (<https://support.industry.siemens.com/cs/ww/en/view/109818723>)

WinCC passwords: Migration of WinCC projects

As of version V7.2, WinCC offers improved encryption of passwords.

Note for migrated project that were created with WinCC prior to V7.2:

- You must re-enter the user name and the password for "WinCC Service Mode" operating mode.
- To increase security of WinCC through improved encryption, you have to re-enter the passwords in the User Administrator.

Make sure that the WinCC passwords meet the standard security guidelines.

Define the minimum complexity in the User Administrator, e.g. the required number of special characters.

In the User Administrator you can also configure the locking of users after multiple failed login attempts.

Migrate WinCC projects remotely only with UNC paths

Use only UNC paths to migrate WinCC projects remotely. Release the project path or the folder above it. Use this UNC path as project directory for the WinCC Project Migrator.

No update of the operating system with WinCC started

An update of the operating system is not permitted if WinCC is started. Start the computer again after updating the operating system.

WinCC documentation: WinCC Information System

The information in the online help is more up-to-date than the information in the printable PDF files.

Openness and system stability

WinCC enables high performance programming of actions on individual graphic objects up to complete functions and global action scripts that are independent of the individual components.

C scripting

WinCC and Windows API functions can be called in the action scripts. In addition, the integrated script programming contains a C interpreter with a large number of standard functions complying to ANSI-C.

Please note that, due to the openness of the system, it is possible to write actions that block the system and lead to system crashes in runtime due to continuous loops, incorrectly initialized pointers, etc. Pay attention to the availability of allocated memory.

VB scripting

VBScript (VBS) enables access to tags and objects of the graphical runtime system during runtime. In addition to VBS standard functions and constants, the Windows Scripting Host and the MS Automation interface can also be used to make the Windows environment dynamic.

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There is no guarantee nor WinCC support for the VBS functionality with regard to its adaptation to the Windows environment.

You can find more information in the following sections of the WinCC Information System:

- "ANSI-C for Creating Functions and Actions"
- "VBS for Creating Procedures and Actions"
- "Process Picture Dynamics"

Time synchronization

Time synchronization between the servers and automation systems is essential for the correct functioning of:

- Redundancy synchronization
- Chronological messaging
- Search and sorting criteria using the time code
- Operating multi-user projects in one domain

You can find more information in the following sections of the WinCC Information System:

- "Redundant systems"
- "Chronological reporting"
- "Multi-user systems"
- "Time synchronization"

Complete download of redundant systems

Do not perform a complete download to the redundant systems in SIMATIC Manager using the "Target system / Compile and Download Objects..." function, as this can create inconsistent data on the target system.

Instead, select the "Download" option in the SIMATIC manager in the shortcut menu of the operating system.

Information on multi-user systems

Clients without their own project in multi-user systems

In multi-user systems, there may be a delay in the selection of the first picture following a redundancy switchover for clients without their own project.

If you are changing the runtime language of a client without its own project in a multi-user system, you will have to close WinCC on the client and exit the WinCC project on the server. Only then will the language be altered.

Remote access from a client without its own project

The server data editor is not available in the WinCC Explorer on a client without its own project.

The "Archive Configuration" entry is not available in Tag Logging and Alarm Logging.

Notes on integration into SIMATIC Manager

Symbolic data block name: Maximum of 16 characters long

If you want to transfer tags from a data block to WinCC, the symbolic name must not exceed 16 characters.

Creating a DCF file

If the DCF file cannot be read after migration, a message regarding the defective file is written to the migration log file.

In order to create another DCF file, proceed as follows. The sequence must be adhered to in all cases:

1. Open the project in the configuration mode.
2. Remember your own symbolic computer name (server prefix) needed for later export.
3. Remember the storage location of the imported server data.
4. Remember the preferred server and the default server.
5. Delete your own and imported server data.
6. Close the project.
7. Delete the DCF file in project directory (typically ProjectName.dcf).
8. Reopen the project in the configuration mode.
9. Create your own server data, making sure to maintain the original symbolic computer name (server prefix) (see step 2).
10. Import all imported packages again (see step 3).
11. Reconfigure the preferred server and default server (see step 4).
12. Close the project.

You can find more information on DCF files on the Internet under Entry ID 109763043:

- SiePortal: "How do you delete the DCF file of your WinCC project?" (<https://support.industry.siemens.com/cs/ww/en/view/109763043>)

CPU load

If data, transferred from a server to a client, cannot be processed at the same speed, the client rejects the data frames from a specified threshold value.

The following process control messages are issued in conjunction with this:

- 1000200: "WCCRT:Status"

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You will find the following additional information in the comment of this message or in the log file "WinCC_Sys_<x>.log":

- 1000200,4,,<Computer name>, DataManager Runtime, RPC call took longer than 5000 msec
(Client requires a very long time to process the data)
- 1000200,4,,<Computer name>, DataManager Runtime, Update data for Client '<client name>' lost,
(message frames for the client are discarded on the server)

Data may be lost on the client.

Notes on internal functions

Diagnostic functions and special functions

Special key functions can be enabled via Registry Keys for the internal diagnostics of WinCC Graphics Runtime via the following path:
"HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\SIEMENS\WinCC\Graphic-Settings\General\HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\SIEMENS\WinCC\Graphic-Settings\General\EnableGlobalSettings".

- <F1>: Switch between GDI+ and D2D
- <F2>: Performance test
- <F3>: Display shadow
- <F4>: Switch between default/HW/SW mode
- <F6>: Switch to "WinCC Classic" design
- <F7> – <F9>: Switch between designs 1–3
- <F10>: Show Runtime overlay

Note

For internal diagnostic purposes only

These functions may only be used by Siemens Support employees for internal diagnostic purposes.

See also

SiePortal: WinCC demo projects (search) (<https://support.industry.siemens.com/cs/products?search=demo&ntp=ExampleOfUse&o=DefaultRankingDesc&pnid=14867&lc=en-WW>)

SiePortal: WinCC V8.0 demo project (download, entry ID 109823232) (<https://support.industry.siemens.com/cs/ww/en/view/109823232>)

SiePortal: "How do you delete the DCF file of your WinCC project?" (<https://support.industry.siemens.com/cs/ww/en/view/109763043>)

SiePortal: Updates for WinCC 8.0 and WinCC V8.0 ASIA (downloads, entry ID 109818723) (<https://support.industry.siemens.com/cs/ww/en/view/109818723>)

1.2.3.2 Information on WinCC CS

General information

Using several WinCC editors

Do not use multiple WinCC editors at the same time because the editors can access the same WinCC components. For example, use of the "Text Distributor" and "Cross Reference" editors or automatic update of the Cross Reference when the Graphics Designer is being accessed simultaneously via interfaces.

If you would like to work in several WinCC editors in parallel, activate the function "Multi-User-Engineering" in the WinCC project.

Information on the Graphics Designer

Custom ActiveX controls (SIMATIC WinCC/ODK)

You must verify compatibility of custom ActiveX controls (SIMATIC WinCC/ODK) with the WinCC Basic System, WebNavigator Server, and WebNavigator Client.

This applies to both a direct installation of the ActiveX control on the computer with WinCC, Web server or Web client and the installation using a plug-in, such as on the Web client.

- With a direct installation, the ActiveX control should therefore be installed prior to WinCC Basic System, Web Server or Web Client.
If the custom ActiveX controls do not function without error after this step, there is no compatibility.
- If the custom ActiveX Control was packaged in a plug-in and installed via download, an upgrade of WinCC Basic System, Web Server or Web Client will also require generation of a new plug-in using this ActiveX Control.
When creating the plug-in, care should be taken to use compatible binaries (DLL, OCX, etc.).

Visual C++ Redistributable for Visual Studio

Microsoft Redistributable Packages for Visual Studio C++ 2015 are installed along with WinCC.

For example, if you are using ActiveX controls or Visual Basic projects created with versions prior to Visual Studio 2015, you must install the corresponding package.

The installation files for redistributables < Visual Studio 2015 are included in the WinCC scope of delivery:

- "Additional Content" DVD:
"VCRedist" folder

Select the setup for the required version:

- 2005x86 / 2005x64
- 2008x86 / 2008x64
- 2010x86 / 2010x64
- 2012x86 / 2012x64

Do not change the folder "GraCS/SVGLibrary"

Do not save any process pictures or faceplate types in the project folder under "GraCS/SVGLibrary".

The folder "SVGLibrary" is only used for SVG libraries.

OLE object of the type "Adobe Acrobat Document"

You can receive error messages in connection with OLE objects of the type "Adobe Acrobat Document" under the following circumstances:

- If you are using an OLE object of the type "Adobe Acrobat Document" in a picture and you save the picture multiple times, saving is aborted with an error message.
- If you then open the respective picture, the file cannot be opened correctly due to an error.
- If you try to save a picture with an OLE object of the type "Adobe Acrobat Document" multiple times, an error message appears when the object is inserted.

If one of the error messages listed occurs, install the latest version of 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>)

I/O fields copied from WinCC < V7.3: No data format "Date/Time"

When you copy an I/O field created in WinCC < V7.3, the "Date/Time" data format is not available for the pasted I/O field.

Pictures with transparent areas: Using file formats with alpha channel

If you want to use a graphic for Direct2D display which contains transparent areas, use only graphic formats with an alpha channel, e.g. BMP or PNG.

Information on the logging system

Print barcode: "Code 39 Logitogo" font

The "Code 39 Logitogo" font is language-dependent.

If you are using this font in a layout, not all languages may be printed correctly.

Solution

To print barcodes, use the "Version for MS Dynamics German + English" font.

This font is language-independent. The barcodes are printed even if the computers have different language settings.

More information is available from Product Support under the entry ID 109750328:

- SiePortal: FAQ 109750328 (<https://support.industry.siemens.com/cs/ww/en/view/109750328>)

Information on VBA**VBA updates**

The user is solely responsible for the installation of updates for VBA.

The corresponding updates for VBA are made available by Microsoft on the download pages. Siemens does not supply any updates from Microsoft.

Install the updates for VBA after installing WinCC.

Notes on the channels**Name of a channel with national characters**

When you enter a name with national characters in the "SIMATIC S7 Protocol Suite" channel and especially in the "Named Connections" channel unit, you must have set the corresponding code page in the language options of the operating system.

See also

Scope of delivery (Page 9)

SiePortal: FAQ 109750328 (<https://support.industry.siemens.com/cs/ww/en/view/109750328>)

1.2.3.3 Information on WinCC runtime**Information on multi-user systems****Copying large amounts of data via the terminal bus**

Copying larger amounts of data on a computer connected to a terminal bus can effect communication in a multi-user system. One of the possible causes is the use of hubs with a low data throughput.

Information on Tag Logging / Alarm Logging

Editing archive data already saved

Archived measured values/messages of previously saved archives cannot and should not be changed due to reasons of data security and consistency.

WinCC controls: CSV export of Runtime data

If the CSV file reaches a size of 128 MB during the export, the data records are transferred incompletely.

You can find additional information on the truncated data records in the following log file:

- <Installation directory>\WinCC\Diagnose\WinCC_Sys_02.log
Parameter: ms_dwMaxClientCallbackDataSizeMaximum

Information on OPC

SIMATIC WinCC OPC Server: Automatic assignment of DCOM rights

The DCOM rights required for operation of the OPC server are assigned automatically. The settings are performed during the installation. Depending on the WinCC operating mode, further configurations are performed.

You must not edit these settings manually.

No deinstallation of SIMATIC WinCC OPC Server when the OPC channel is used

When you use the OPC channel, you must not remove the SIMATIC WinCC OPC DA Server.

OPC tags: Timestamp for Alarm Logging and Tag Logging

If messages are triggered by OPC tags, the message timestamp is used by the OPC server, comparable to chronological reporting.

For Tag Logging the timestamp is generated by the Tag Logging server.

OPC Data Access

During operation of the OPC DA server on the WinCC client:

While the connection of the OPC client is being established, the WinCC server with which the OPC client exchanges data must be in Runtime.

If the WinCC server is deactivated, not all properties of the items will be provided.

Since the display of data types in OPC Item Manager requires a lot of time, the display should be turned off if it is not needed.

OPC Historical Data Access

Return value "OPC_E_MAXEXCEEDED" for archive access

If the OPC client demands data from more than 2000 values during synchronous or asynchronous reading, the call is rejected with a return message OPC_E_MAXEXCEEDED.

This limit serves to limit the computer load and duration of the call.

This restriction does not apply if the entire time range is read.

OPC Alarm&Event

Avoid bounding values

Avoid using bounding values when reading historical alarms via the WinCC-OPC-A&E-server.

Otherwise, processing read access requests can take a long time, depending on the size of the archive.

Filtering messages when using format instructions in the user text block

The OPC source of a message is shown in an user text block. This is user text block 2 with the default setting.

If you use format instructions in this user text block, you need to use wild cards for the filter setting.

This ensures correct filtering when the OPC sources are generated dynamically in Runtime.

1.2.3.4 Information on Smart tools

WinCC Configuration Studio: Replacement of SmartTools

Compared to earlier WinCC versions, the following SmartTools have been replaced by the editors in the WinCC Configuration Studio:

SmartTool	WinCC Configuration Studio
Tag Export/Import	Export/import function of the "Tag Management" and "Tag Logging" editors
WinCC ConfigurationTool	
WinCC Archive ConfigurationTool	
Tag simulator	WinCC TAG Simulator

WinCC ConfigurationTool / WinCC Archive ConfigurationTool

As of WinCC V7.3 you import and export the WinCC data via the WinCC Configuration Studio.

To import already existing files from the WinCC Configuration Tool/WinCC Archive ConfigurationTool into the WinCC Configuration Studio, use the menu command "Import" in the WinCC Configuration Studio.

In addition to the file name, select the "ConfigTool file (*.xlsx)" or "Archive Config Tool file (*.xlsx)" entry in the file selection dialog.

1.2 WinCC Release Notes

If you have configured the colors of message types in the WinCC Configuration Tool, the colors are not imported into the WinCC Configuration Studio from the Configuration Tool. You either need to create the message colors in the WinCC project before migrating the WinCC project to WinCC V7.3 and higher or, alternatively, manually configure the message colors later after the import in the WinCC Configuration Studio.

Tag Export/Import

To export tags from a WinCC project or import them into a WinCC project, use the WinCC Configuration Studio.

For compatibility reasons, the "Tag Export/Import" tool is still included in the "uTools" installation path.

Information on the Dynamic Wizard Editor

Opening the Dynamic Wizard Editor

The Dynamic Wizard Editor and the Graphics Designer should not be opened at the same time.

1.2.3.5 Information on process communication

Information on the WinCC "SIMATIC S7 Protocol Suite" channel

Process communication with an S7-300 via "SINUMERIK" instead of "SIMATIC S7 Protocol Suite"

As of WinCC V8.1, communication with a PLC S7-300 is configured via the "SINUMERIK" communication channel.

After migrating to WinCC V8.1, you will find S7-300-type PLCs configured in older versions under the "SINUMERIK" communication channel.

S7DOS configuration: Enabling the IPv4 protocol

If using S7DOS, you will require the IPv4 protocol as of the "S7DOS V9" version.

Therefore, leave the IPv4 protocol enabled in the Ethernet properties for the network adapter or the SIMATIC Ethernet CPs.

In this way, you ensure that the S7DOS module detection works for the TCP, RFC1006, and ISO protocols.

PROFIBUS: Number of connections

With WinCC V7/V8, up to 8 MPI connections or PROFIBUS Softnet connections, for example, CP5622, are licensed. Additional PROFIBUS Softnet licenses are not required.

With a corresponding SIMATIC NET license, you can also create more than 8 PROFIBUS connections. You need PROFIBUS Hardnet for this, for example, CP5623.

Time change on an S7 automation system when using AR_SEND

Archive data transferred from the S7-AS to WinCC with AR_SEND is ignored if the time is reset on the AS, e.g. following time synchronization. This is because the archive already contains the reset time period.

Information on the WinCC "WinCC-OPC-UA" channel

OPC UA: Displaying imported OPC UA tags

Tags created with a WinCC version older than V7.4 are shown as imported in the "Symbols" view of the Configuration Studio.

However, in this case "Raw data" tag types are not shown as imported. The "Access" column is disabled, although these tags have been correctly created in the Tag Management.

Reimport these tags and delete the incorrectly displayed tags in the Configuration Studio.

WinCC OPC UA server: Methods - Output parameters

When you address VB scripts using OPC UA, the output parameters of the scripts always have the data type "Variant".

The OPC UA client always receives the output value as "Variant" in the response to the call.

The client extracts the correct data type of the output value from the received variant.

Migrated projects: Updating the OpenSSL version for WinCC OPC UA

OpenSSL 3.0 is used for WinCC OPC UA as of the following WinCC versions:

- WinCC V7.5 SP2 Update 15
- WinCC V8.0 Update 3
- WinCC V8.1

If the OPC UA certificate of an HMI device was created with a WinCC version that does not yet use OpenSSL 3.0, the certificate becomes incompatible when the device is upgraded.

Recreate the certificate.

HMI device uses CA-based certificate

The OPC UA certificate of the HMI device was created using WinCC Certificate Manager.

1. Upgrade the certificate authority device and the HMI device.
2. Recreate the OPC UA certificate of the HMI device on the certificate authority device using WinCC Certificate Manager.
3. Install the certificate on the HMI device using WinCC Certificate Manager.

HMI device uses a self-signed certificate

1. Delete the certificate from the certificate storage before upgrading the HMI device:
 - OPC UA client certificate:
C:\Program Files (x86)\Siemens\WinCC\opc\UAClient\PKI
 - OPC UA server certificate:
C:\Program Files (x86)\Siemens\WinCC\opc\UAServer\PKI
 - If you use the WinCC/Connectivity Pack with a WinCC Connectivity Station, delete the WinCC Connectivity Station server certificate:
C:\Program Files (x86)\Siemens\ConnectivityStation\OPC\UAServer\PKI\CADelete both the DER file and the PFX file.
2. Upgrade the HMI device.
The OPC UA server certificate on the HMI device is automatically created and installed.
3. Start Runtime and establish the connection between the OPC UA client and OPC UA server.
The OPC UA client certificate is automatically created and installed.
4. Trust the certificate on the communication peers.

HMI device uses CA-based certificate created with a third-party tool

The OPC UA certificate of the HMI device was created with a third-party tool.

1. Migration of WinCC versions prior to V8.0:
If needed, delete the root certificate of the third-party vendor and the OPC UA application certificate from the certificate storage before upgrading the HMI device:
 - OPC UA client certificate:
C:\Program Files (x86)\Siemens\WinCC\opc\UAClient\PKI
 - OPC UA server certificate:
C:\Program Files (x86)\Siemens\WinCC\opc\UAServer\PKI
 - If you use the WinCC/Connectivity Pack with a WinCC Connectivity Station, delete the WinCC Connectivity Station server certificate:
C:\Program Files (x86)\Siemens\ConnectivityStation\OPC\UAServer\PKI\CADelete both the DER file and the PFX file of the application certificate.
2. Upgrade the HMI device.
3. Upgrade the third-party tool to a version that uses OpenSSL 3.0.
4. Recreate the OPC UA certificate of the HMI device with the tool.
5. To install the certificate on the HMI device, copy it to the certificate storage on the HMI device:
 - OPC UA client certificate:
C:\Program Files (x86)\Siemens\WinCC\opc\UAClient\PKI
 - OPC UA server certificate:
C:\Program Files (x86)\Siemens\WinCC\opc\UAServer\PKI
 - If you use the WinCC/Connectivity Pack with a WinCC Connectivity Station, copy the certificate to the WinCC Connectivity Station:
C:\Program Files (x86)\Siemens\ConnectivityStation\OPC\UAServer\PKI\CA

If the communication partner already trusts the root certificate of the certificate authority, it automatically also trusts the newly created OPC UA certificate of the HMI device.

Information on the "SIMATIC S7-1200, S7-1500 Channel" WinCC channel

No raw data communication with S7-1200/S7-1500 controllers

The "SIMATIC S7-1200, S7-1500 Channel" channel does not support any raw data communication via the S7 communication "BSEND/BRCV" function.

Information on the WinCC "Mitsubishi Ethernet" channel

Bit addressing with incorrect data type

Ensure that the bit addressing has the correct data type.

Incorrect addressing can result in the incorrect data type being written and as a result the adjacent bits being influenced.

The addressing of, for example a BOOL address with the data type WORD can result in the adjacent bits of the addressed bit being overwritten.

Information on the WinCC "SIMATIC S5 PROFIBUS DP" channel

PROFIBUS DP and SIMATIC Net V14

In order to use the "PROFIBUS DP" channel with SIMATIC Net V14, you must disable the "OPC UA" property for the "DP" protocol in the communication settings of SIMATIC Net V14.

Information on the WinCC "SIMATIC 505 TCPIP" channel

LMode and LStatus data types

The channel has been extended by the data types LMode and LStatus.

- LMode (loop mode): unsigned 16-bit value (bit array); access: read and write
- LStatus (loop status): unsigned 16-bit value (bit array); access: Read ONLY

The offset to be specified during addressing identifies the loop whose mode or status should be requested.

1.2.3.6 Remote access and Remote Desktop Protocol (RDP)

Remote access to WinCC stations

You can find current instructions for remote access in the FAQ 78463889:

- SiePortal: Remote access to WinCC stations (<http://support.automation.siemens.com/WW/view/en/78463889>)

For more information on remote configuration in the WinCC Information System:

- "Configurations > Distributed systems > Remote configuration"

Released scenarios

The following scenarios have been tested:

- WinCC as single-user system
- WinCC as distributed system
- WinCC in redundant mode
- WinCC/WebUX server

You can also use communication via OPC in the released scenarios.

Use of RealVNC

For instructions on how to use "RealVNC", refer to FAQ 55422236:

- SiePortal: Access via "RealVNC" to WinCC stations and PCS 7 stations (<https://support.automation.siemens.com/WW/view/en/55422236>)

No keyboard lock with RealVNC

With "RealVNC", the keyboard lock is not supported.

The keyboard lock is only in effect with a Remote Desktop Protocol connection.

Remote maintenance of WinCC systems via RDP

Use of the Remote Desktop Protocol (RDP) is only permitted when the WinCC server or the single-user system is running in WinCC ServiceMode.

Restrictions when using RDP

The following restrictions apply when using RDP:

- Start the WinCC project with a user which is a member of the local "SIMATIC HMI" user group. This means that all services are started when operating via the remote console. More information is available under "Configurations > WinCC ServiceMode"
- Use in integrated operation in SIMATIC Manager is not released.

NOTICE
Data loss after interruption of the remote desktop connection
When the remote desktop connection is interrupted, for example, because the network cable was removed from the computer of the Remote Desktop Client, the archives and the OPC server, among others things, will no longer receive values from the data manager.
This status will persist until the connection has been restored, or the timeout of approximately 35 seconds has expired.

Starting the Remote Desktop

You can access WinCC systems with a Remote Desktop client via a console session.

Access via the Remote Desktop Protocol may only be gained by means of console takeover with the same user, or initial login.

User groups and access rights

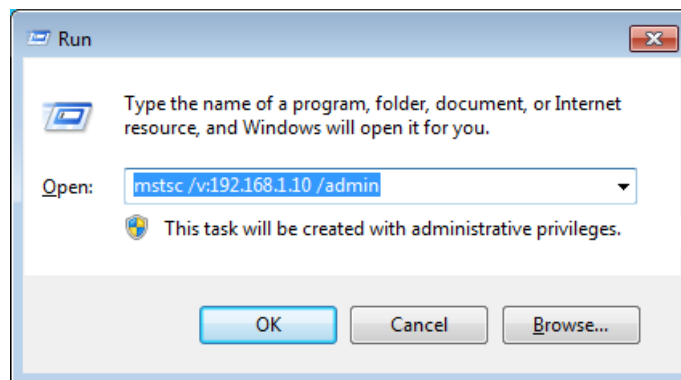
All "Remote Desktop" users must be members of the "SIMATIC HMI" user group on the target PC.

Procedure

1. To start a console session, open the "Run" dialog, for example, with <Windows button+R>.
2. Enter the following command:

```
- mstsc /v:<Server> /admin
```

Enter the computer name or the IP address as server.



For information on more parameters, enter the following command:

```
- mstsc /?
```

Migration: Migrate WinCC projects remotely only with UNC paths

To migrate WinCC projects remotely, use only UNC paths.

Release the project path or the folder above it.

Use this UNC path as project directory for the WinCC Project Migrator.

See also

Notes on Data and System Security (Page 27)

SiePortal: Remote access to WinCC stations (<http://support.automation.siemens.com/WW/view/en/78463889>)

SiePortal: Access via "RealVNC" to WinCC stations and PCS 7 stations (<https://support.automation.siemens.com/WW/view/en/55422236>)

1.2.3.7 Ports and protocols

Network settings

The following table shows network ports that are used for internal and external communication. These ports cannot be used in any other way.

The setup configures the ports for the firewall in such a way that smooth operation is ensured. The default settings for port and protocol refer to the state after installation.

Note

Assigning TCP/IP port numbers

Accept the default port numbers without changing them.

If the port numbers are changed due to company IT administration specifications, the user is responsible for ensuring that no collisions occur.

Port assignments

The list is not complete. Depending on the installed products and the components used, additional network ports can be occupied.

Service	Port number	Transport protocol	Communication direction	Function	Description
Client-server communication					
SCS Secure Communication	8910	TCP/UDP	Inbound Outbound	Client-server communication (encrypted)	
RPC	*	UDP	Inbound Outbound	Client-server communication (CCAgent, unencrypted)	
RPC	*	UDP	Inbound Outbound	Client-server communication (CCEServer/CCEClient, unencrypted)	
HTTPS	443	TCP	Inbound Outbound	WinCC/WebUX	Secure communication with a Web server
HTTPS	4430	TCP	Inbound Outbound	WinCC/WebNavigator WinCC/DatatMonitor	Secure communication with a Web server
SQL server					
SQL	1442	TCP	Inbound Outbound	Remote access to a WinCC instance	
OPC UA					

Service	Port number	Transport protocol	Communication direction	Function	Description
OPC UA Service	4861	TCP	Inbound	OPC UA server (OPC UA server for Connectivity Station)	Primary communication via OPC UA The service is enabled and configured during installation.
OPC UA Service (WinCC)	4862	TCP	Inbound	OPC UA server (OPC UA server for WinCC)	Primary communication via OPC UA The service is enabled and configured during installation.
OPC UA Discovery	4840 52601	TCP	Inbound	OPC UA server (LocalDiscovery)	Provides information about installed OPC servers The service is installed and configured by the OPC UA server.
Additional components					
RFC 1006	102	TCP	Outbound	S7 channel	Communication with the S7 controller via Ethernet/PROFINET
DCOM	135	TCP	Inbound	OPC server	Part of the Microsoft Windows operating system Since communication via OPC (DA) is based on DCOM, the service is required to initialize OPC (DA) connections.
DCOM	*	TCP	Inbound	OPC server	Communication via OPC (DA) is based on DCOM and uses unspecified ports assigned by the system. Take this into account when using OPC (DA) and creating rules for firewalls.
NetBIOS Name Service ¹⁾	137	UDP	Inbound	OPC server	Part of the Microsoft Windows operating system Access to this service is required, for example, for browsing.
NetBIOS ¹⁾	138	UDP	Inbound	OPC server	Part of the Microsoft Windows operating system Access to this service is required, for example, for browsing.
NetBIOS Session Service ¹⁾	139	TCP	Inbound	Server-client communication	
SMB ²⁾	445	TCP	Inbound	Server-client communication	
ALM	4410 ³⁾	TCP	Inbound Outbound	License service	Functionality for software licenses The service is used by the Automation License Manager as well as by all license-relevant software products.
Unified Collaboration	5678	TCP	Inbound Outbound	WinCC Unified Collaboration	

* Port is assigned automatically (dynamic port number)

1.2 WinCC Release Notes

- 1) When resolving the computer name via WINS, the "NetBIOS Name Service" and "NetBIOS Session Service" services must be enabled.
- 2) The Microsoft Windows File Share Protocol is used for ES/OS loading. Ensure that the "SMB" service is enabled.
- 3) Default port that can be changed by user configuration.

See also

Microsoft SQL Server for WinCC (Page 25)

Notes on Data and System Security (Page 27)

1.2.4 Notes on WinCC Redundancy

Notes on redundant systems

Redundancy behavior in case of double failure

Double failures are not covered by redundancy.

A double failure occurs, for example, when the terminal bus was pulled on server 1 while server 2 was deactivated.

Delay in swapping out archives

The swapping of archives will be delayed if a redundant partner is not available or deactivated.. Swapping of archives will not start or continue until the partner is available once again and after archive synchronization.

An extended failure of the redundant partner may result in data loss, because the memory capacity of the circular buffer for Tag Logging and Alarm Logging is limited.

No reloading of messages after network failure

The reloading of messages after network failure is not permitted for redundant systems.

Configuring used standard gateway

For redundancy, it is recommended to configure a standard gateway for the correct detection of failure scenarios. The standard gateway must be properly configured on both redundancy servers for this. This can be done manually or via DHCP.

For a configured standard gateway, ensure that this gateway cannot only be reached but is also accessible using a "ping".

Use of DHCP: Starting computer only with active network connection

If you are using DHCP on the terminal bus network card, note the following in a redundant system:

The computer must obtain a valid IP address from the DHCP server during startup.

Otherwise, the redundancy status is always indicated as "fault". This status can only be reset by restarting the computer.

Message sequence report in a redundant system

If you output a message sequence report on a client, you may encounter problems during logging when switching to the redundant partner.

1.2.5 Notes on Process Control Options

Creating a New Project

If you create a new project manually, you must first run the OS Project Editor.

While creating an OS using PCS 7 Engineering Station, the OS project editor is automatically called in the background and initialized using the default settings.

Removing unneeded "@*.PDL" pictures before migration

If the OS Project Editor has processed a WinCC project, the "@*.PDL" pictures of Basic Process Control will have been installed in the Graphics Designer.

If you do not need these pictures following the migration, you not only have to remove the "*@.PDL" pictures prior to migration, but also the "PAS" files and "SSM.cfg".

After the migration, the files from Basic Process Control are no longer added.

Multiple languages

Online documentation in the WinCC Information System is available only in English, French, German and Chinese (Simplified, PR China).

If you work with a French, English or German version of Microsoft Windows computer software and install a different language, it is possible that terms in WinCC appear in this language even if WinCC is operated with the same language as Microsoft Windows.

Different buttons have English labels especially in the multi-lingual versions of Microsoft Windows independent of the language setting and independent of the WinCC language. This affects dialog boxes in particular which the user must respond with Yes/No, OK/Cancel etc.

Tags with @ prefix

Project engineers may not create any tags with @ prefix. This is reserved for the WinCC-PCS 7 software.

1.2 WinCC Release Notes

You are not allowed to manipulate these system tags.

The system tags are required so that the product works properly.

While configuring AS and OS monitoring using Lifebeat Monitoring, device names should not be identical to area names in Picture Tree or internal tags with the "@" name prefix.

Area names in Alarm Logging and in the Picture Tree

Area names in Alarm Logging and in Picture Tree must not contain any spaces at the beginning or end.

Area names in distributed systems

With distributed systems, the area names in the projects of the various WinCC servers must be unique in order to ensure correct filtering and display of the messages according to the area.

Process picture in the plant view: Level 16 is hidden

Level 16 is always hidden when you create a new process picture in SIMATIC Manager in the plant view or with the WinCC Explorer.

Do not change this setting if you are using PCS 7 ASSET. The hidden level contains an "@RTBehaviourParams" object that is used for diagnostic purposes.

Image painting time

To optimize the image painting time, set the "WinCC Classic" design in the WinCC project properties.

User authorization "No. 8 Controlling archives"

User authorization "No. 8 Controlling archives" in User Administrator is no longer used by the system.

Authorization check in WinCC ServiceMode

There are three possible scenarios for WinCC in ServiceMode that influence the Runtime behavior through the authorization check:

- No Microsoft Windows user is logged on.
A user is defined as "User in service context" in WinCC User Administrator.
The authorizations of this user in the service context will be checked in Runtime. This setting will influence the trigger authorization for the signaling device.
- No Microsoft Windows user is logged on.
No user is defined as "User in service context" in WinCC User Administrator.
The signaling device will always be activated in Runtime.
- A Microsoft Windows user is logged on. Interactive user inputs are possible.
If a user is defined in the service context does not have an effect in Runtime.
The authorizations of the logged on WinCC user will be checked in Runtime.

Lifebeat Monitoring: Direct WinCC connection instead of OPC DA connection

Use the direct connection from WinCC to PC to configure the Lifebeat Monitoring

As of WinCC V8.1 you do not require an OPC DA connection between the WinCC stations anymore.

See also

Additional steps during migration (Page 219)

1.3 WinCC/Connectivity Pack Installation Notes

1.3.1 Connectivity Pack licensing

Introduction

The WinCC/Connectivity Pack enables licensed access to online and archive data of WinCC.

The Connectivity Pack includes licenses for access using:

- WinCC OPC-DA Server
- WinCC OPC HDA Server
- WinCC OPC A&E Server
- WinCC OPC UA Server
- WinCC REST communication
- "WinCC Unified Channel" WinCC channel

Starting from WinCC/Connectivity Pack V7.0, a WinCC Client Access License (WinCC/CAL) is no longer required.

See also

Overview of the licensing (Page 244)

1.3.2 Installation of the Connectivity Pack Server

Introduction

The installation of the Connectivity Pack server includes the following components:

- WinCC OLE DB Provider
- Microsoft SQL Server 2022 64-bit
- "Automation License Manager" for Management of WinCC Licenses
- WinCC Archive Connector
- WinCC DataConnector
- WinCC Basic Components
- Documentation
- Examples

Requirement

- Hardware requirement:
Observe the hardware requirements of WinCC V8.1 for WinCC servers.
- Operating system:
 - Microsoft Windows 10 Pro / Enterprise / Enterprise LTSC (max. 3 clients) 64-bit
 - Microsoft Windows 11 Pro / Enterprise (max. 3 clients) 64-bit
 - Microsoft Windows Server 2019 Standard / Datacenter 64-bit
 - Microsoft Windows Server 2022 Standard / Datacenter 64-bit
- Microsoft Message Queuing is installed and configured during WinCC installation.
- For access to WinCC RT archives, WinCC V8.1 must be installed.

Note

To use more than three clients, you must install the server version.

With the workstation version, you can use max. three clients.

Procedure

1. In order to configure a computer as Connectivity Pack Server, run the Connectivity Pack Server setup on the computer.
2. Select the "ConnectivityPack-Server" entry on the WinCC Product DVD in the "Program Packages" dialog.

Licensing

For operation of the Connectivity Pack Server, the license for the WinCC Connectivity Pack option is required.

Access rights

All users of the WinCC/Connectivity Pack have to be included in the Microsoft Windows user group "SIMATIC HMI".

The user has to be a member of the user group "SIMATIC HMI" on the Connectivity Pack server for remote access of a Connectivity Pack client.

1.3.3 Installation of the Connectivity Pack Client

Introduction

The installation of the Connectivity Pack Client includes the following components:

- WinCC OLE DB Provider
- WinCC DataConnector
- SQL Connectivity Tools
- Documentation

Note

In order to install the SQL Connectivity Tools, you will need administrator rights on the computer.

Requirement

- Operating system:
 - Microsoft Windows 10 Pro / Enterprise / Enterprise LTSC 64-bit
 - Microsoft Windows 11 Pro / Enterprise 64-bit
 - Microsoft Windows Server 2019 Standard / Datacenter 64-bit
 - Microsoft Windows Server 2022 Standard / Datacenter 64-bit
- Microsoft Message Queuing is installed and configured during WinCC installation.

Procedure

1. In order to configure a computer as Connectivity Pack Client, run the Connectivity Pack Client setup on the computer.
2. Select the "ConnectivityPack-Client" entry on the WinCC Product DVD in the "Program Packages" dialog.
3. If WinCC V8.1 is already installed on the client, an additional installation of the Connectivity Pack Client is not required.

Access rights

All users of the WinCC/Connectivity Pack have to be included in the Microsoft Windows user group "SIMATIC HMI".

The user has to be a member of the user group "SIMATIC HMI" on the Connectivity Pack server for remote access of a Connectivity Pack client.

1.4 WinCC/Connectivity Pack Release Notes

1.4.1 Information on the Connectivity Pack

Content

These release notes contain important information.

The statements in these release notes take precedence over information provided in the manuals and in the online help.

Please read these release notes carefully as they contain useful information.

Exchange of data between OPC client and Connectivity Station via OPC UA

The OPC UA server on a WinCC Connectivity Station can be reached via this address:

- "opc.tcp://[HostName]:[Port]"

HostName	Placeholder for the computer name. The name is entered automatically.
Port	Port number. The default is "4864".

Limitation for use of WinCC OLEDB Provider

As of WinCC V7.2, the function "Import" via the interface "WinCC OLEDB Provider" does not run in MS Office Excel.

1.5 WinCC/DataMonitor Installation Notes

1.5.1 Requirements of installing DataMonitor

Introduction

Certain hardware and software configuration requirements must be fulfilled for installation.

Note

A DataMonitor server cannot be operated on a WinCC client without a project of its own. Only use a DataMonitor server on a computer which is not operated in WinCC ServiceMode.

Hardware requirements

To work with WinCC/DataMonitor efficiently, select a system that meets the recommended specifications for an optimum configuration.

DataMonitor server

		Minimum	Recommended
DataMonitor server on WinCC server for more than 10 clients	CPU	Dual core CPU; 2.5 GHz	Multi core CPU; 3.5 GHz
	Work memory	4 GB	8 GB
DataMonitor server on WinCC server with WinCC project in runtime	CPU	Dual core CPU; 2.5 GHz	Multi core CPU; 3.5 GHz
	Work memory	4 GB	8 GB
DataMonitor server on WinCC server	CPU	Dual core CPU; 2.5 GHz	Multi core CPU; 3.5 GHz
	Work memory	4 GB	> 4 GB
DataMonitor server on WinCC single-user system or WinCC client with its own project	CPU	Dual core CPU; 2.5 GHz	Multi core CPU; 3.5 GHz
	Work memory	4 GB	> 4 GB

DataMonitor client

	Minimum	Recommended
CPU	Dual core CPU; 2 GHz	Multi core CPU; 3 GHz
Work memory	1 GB	2 GB

Software requirements

Certain requirements concerning operating system and software configuration must be met for the installation.

Microsoft Internet Information Service (IIS)

During the WinCC installation, the Microsoft Internet Information Service (IIS) is installed and configured.

DataMonitor server on WinCC server

Operating system	Software
Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit	WinCC Basic System V8.1 or WinCC File Server V8.1

If you want to publish Intranet information, the following is required:

- A network-capable computer with a LAN connection
- A system that converts computer names into IP addresses. This step allows users to use "alias names" instead of IP addresses when connecting to your server.

If you want to publish information on the Internet, the following is required:

- An Internet connection and an IP address from your Internet service provider (ISP). You can only publish information in the Internet, if you have a connection to the Internet provided by the ISP.
- A network adapter that is suitable for connecting to the Internet.
- A DNS registration for your IP address. This step allows users to use "alias names" instead of IP addresses when connecting to your server.

DataMonitor server on WinCC single-user system or WinCC client with its own project

Operating system	Software
Microsoft Windows 10 Pro / Enterprise / Enterprise LTSC 64-bit (max. 3 clients) Microsoft Windows 11 Pro / Enterprise 64-bit (max. 3 clients) Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit	WinCC Basic System V8.1 or WinCC File Server V8.1 For the components "Excel Workbook Wizard" and "Excel Workbook": <ul style="list-style-type: none"> • Microsoft Office 2019 32-bit version, 64-bit version ¹⁾ • Microsoft Office 2021 32-bit version, 64-bit version ¹⁾ • Microsoft Office 365 32-bit version, 64-bit version ¹⁾

1) ActiveX controls that were created with a 32-bit version are not compatible with the 64-bit version of Microsoft Office 365. You can only use the Excel add-in with the 32-bit version of Microsoft Office 365.

You also need access to the Intranet/Internet or a TCP/IP connection to the Web client.

DataMonitor client

Operating system	Software
Microsoft Windows 10 Pro / Enterprise / Enterprise LTSC 64-bit Microsoft Windows 10 Pro / Enterprise 64-bit Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit Also other operating systems via MS Terminal Services	For the components "Excel Workbook Wizard" and "Excel Workbook": <ul style="list-style-type: none"> • Microsoft Office 2019 32-bit version, 64-bit version ¹⁾ • Microsoft Office 2021 32-bit version, 64-bit version ¹⁾ • Microsoft Office 365 32-bit version, 64-bit version ¹⁾

1) ActiveX controls that were created with a 32-bit version are not compatible with the 64-bit version of Microsoft Office 365. You can only use the Excel add-in with the 32-bit version of Microsoft Office 365.

You also need access to the Intranet / Internet or a TCP/IP connection to the Web server.

1.5.2 User rights for installing the DataMonitor client

Introduction

You can install the DataMonitor client as follows:

- Installation from the product DVD
In this case, certain Microsoft Windows user rights are required, depending on the operating system.
- Installation via the Intranet/Internet
In this case, certain Microsoft Windows user rights are required, depending on the operating system.
- Installation using the group policy-based software distribution in networks
This can be done without any user interaction and using the Microsoft Windows user rights of the current user.

Microsoft Windows user rights required for installation and initial logon of the client

Depending on the operating system, specific minimum user rights are required to install the DataMonitor client via Intranet/Internet.

After installation, the client must log in with the following user identification for initial registration on the DataMonitor server:

- Under a user identification with Windows user rights higher or equal to those defined by the user identification that was given for the installation.

The connections must be established successfully. The subsequent logins can then be performed under a different Windows user authorization with possibly limited rights.

Minimum required user rights:

- Administrator

Installing the DataMonitor client with limited Microsoft Windows user rights

Using Microsoft Windows Installer technology (MSI), DataMonitor clients can also be installed with limited Windows user permissions, i.e. permissions other than "Power user" or "Administrator".

This procedure can be set during the installation using the group policy based software distribution in networks.

Even the add-ins and plug-ins for the DataMonitor client can be installed in this way. The minimum user permissions described above are also required to install plug-ins created with WinCC Plug-In Builder.

Using MSI technology, it is also possible to install the DataMonitor client for a configured group of users or computers.

Installation for a configured group of users or computers

The following is possible with the Microsoft Systems Management Server or a group policy on a Domain Controller:

- The installation for a group of users or computers configured by the administrator
 - To do this, the "WinCCDataMonitorClient.msi" MSI file is published on the domain controller and then released for a user group. The installation is then performed according to the configuration of the group policy based software distribution either during login of the defined users or when the computer is started.
 - When using a Microsoft Systems Management Server, the installation is configured by the administrator, triggered and executed when the relevant computer boots. Additional information on Microsoft Systems Management Server is available in the Internet on the Microsoft Homepage.

Group policy based software distribution

Software is normally installed with the access rights of the current Microsoft Windows user. When using MSI technology, the installation is performed by an operating system service with a higher level of rights. This enables installations to be performed for which the Windows user has no permission. Applications which require installations with a higher permission are referred to as "privileged installations" in MSI technology. Installation of these applications is possible when a Windows user is assigned the "Always install with elevated privileges" permission.

In order to use the group policy-based software distribution, a group policy is created on the domain controller and assigned to the distributing software or published using Active Directory.

- Assignment: The software distribution can be assigned to a user or a computer. In this case, the software to be distributed is automatically installed when the user logs in or the computer is started.
- Publication: The software distribution can be published for single users. In this case, when the user logs onto the client computer, the software to be distributed appears in a dialog and can be selected for installation.

See also

Installing DataMonitor (Page 99)

1.5.3 Installing DataMonitor

Introduction

This section describes the installation of the DataMonitor server and DataMonitor client.

Installation on the DataMonitor client depends on the DataMonitor tool used.

DataMonitor server scope of installation

A DataMonitor server is installed and set up as the web server to enable WinCC/DataMonitor to be used.

1.5 WinCC/DataMonitor Installation Notes

This installation allows you to access the WinCC Runtime archive using "Trends & Alarms".

Only "Webcenter" and "Trends & Alarms" are installed on a computer with WinCC file server, for example, used as a archive server, because the other components require WinCC Runtime. "Webcenter" and "Trends & Alarms" install all necessary components in the process.

Microsoft Internet Information Service (IIS)

During the WinCC installation, the Microsoft Internet Information Service (IIS) is installed and configured.

DataMonitor client installation conditions

You do not need to install the DataMonitor client if you only want to use "Webcenter" and "Trends and Alarms" on the DataMonitor client.

You can install the Excel add-ins "ExcelWorkbook Wizard" and "Excel Workbook" individually under "Reports/Download area" on the DataMonitor start page for the "Reports".

"Microsoft Excel" is needed for "Excel Workbook". The following 32-bit versions of Office are released:

- Microsoft Office 2019
- Microsoft Office 2021
- Microsoft Office 365

Depending on the operating system, specific user rights may be required for installing the DataMonitor client. For more information, refer to "User rights for installing the DataMonitor client (Page 98)".

Note**Downloading the client setup**

To save the client setup on the client computer, select the "Save" option when downloading the client software from the DataMonitor server. It is recommended to save the Setup file because, in the event of a restart of the client computer being necessary, the Setup need not be downloaded again.

If the DataMonitor client has already been installed from DVD and you want to install an updated version of the client via the Intranet/Internet, you must save the client setup on the target computer.

64-bit computer as client

If the DataMonitor client is a 64-bit machine, you first need to install the required Visual C++ Redistributable, which is required for the DataMonitor client. Use the link that is displayed during installation via intranet/Internet.

The required Visual C++ Redistributable must also be available for domain environments as an "msi" package.

If the DataMonitor clients on the 64-bit computers are integrated in domain group policies, the users of the clients must install "DataMonitorClient_x64_AddOn.msi" themselves.

Excel Workbook Wizard requires Microsoft .Net Framework

In order to use Excel Workbook Wizard make sure that the .Net Framework is installed on the DataMonitor client.

Client installation on a DataMonitor server

Proceed as follows if you also wish to install the DataMonitor client or WebNavigator client on a DataMonitor server:

1. Use the Services Manager in Microsoft Windows to set the start type of the "CCArchiveConnMon" service to manual.
 2. Restart the computer.
 3. Install the client.
Ensure that no WebNavigator clients or DataMonitor clients access the server during installation.
 4. Switch the start type of the "CCArchiveConnMon" service back to automatic.
-

Requirement

- The DataMonitor server requires the Internet Information Services (IIS).
- The DataMonitor server requires the WinCC configuration data.
- You need Microsoft Windows "Administrator" rights to install the DataMonitor server.

Procedure

1. Insert the WinCC DVD into the DVD drive.
2. If the automatic execution of an autorun file is activated, after a few seconds the setup program starts automatically.
The setup can also be started manually in case the installation is performed from a network drive or the autorun function has been disabled.
The setup program is started.
3. To install, click the text "Install Software".
4. In the following dialog, select the component "DataMonitor Server" or "DataMonitor Client".
5. Follow the instructions of the setup program.

See also

User rights for installing the DataMonitor client (Page 98)

1.5.4 DataMonitor licensing

DataMonitor client

No license is required for the DataMonitor client on the computer.

The DataMonitor clients are licensed on the DataMonitor server. Install the license keys for the client access to the server on the DataMonitor server.

DataMonitor server

As a prerequisite for the WinCC basic system, the WinCC RT basic license is required.

Licenses are available for 1 / 3 / 10 / 30 clients that can simultaneously access the DataMonitor server. The licenses are cumulative.

A message will appear if the number of licensed clients is exceeded during a login attempt by a DataMonitor client. No further logins will be possible.

Note

The connection to the DataMonitor server is maintained if the user closes the DataMonitor start page without logging off with the "Log off" button.

The license remains allocated and is only released after approximately 20 minutes.

License count

DataMonitor distinguishes between the following function groups:

- Excel Workbooks
A "WinCC DataMonitor" license is required on the server computer for each DataMonitor client.
- Webcenter, Trends & Alarms, Reports
It is not the number of clients but the number of connections that is relevant for the license count for the Webcenter function group.

The following table shows the maximum number of clients or connections per license based on the function group. The values are valid only within a function group.

License	Excel Workbooks ¹⁾	Webcenter, Trends & Alarms, Reports ¹⁾
1 Client	1	3
3 Clients	3	6
10 clients	10	20
30 Clients	30	60

1) The same values apply even if you cumulate licenses.

In the following example, two licenses are installed on the DataMonitor server: "1 Client" a"3 Clients".

The following cumulative values apply depending on the selected function group:

Example: Excel Workbooks

Installed licenses	Function group	Maximum logged on users
"1 Client" + "3 Clients"	Excel Workbooks	4 users

Example: Webcenter, Trends & Alarms, Reports

Installed licenses	Function group	Maximum logged on users
"1 Client" + "3 Clients"	Webcenter, Trends & Alarms, Reports	8 users

No operation without a valid license

If no license is available, DataMonitor displays a page reporting the missing license.

Check the existing licenses. If necessary, install the required licenses.

Using DataMonitor versions prior to V7.4

DataMonitor versions up to V7.3 do not recognize licenses from DataMonitor V7.4 and higher.

Once you install the current DataMonitor licenses on a computer, a DataMonitor installation of a version prior to V7.4 is no longer licensed.

This also applies if you upgrade to the new cumulative licenses through an upgrade license. The upgraded licenses are no longer recognized by DataMonitor V7.3 or earlier versions.

The upgrade to DataMonitor V7.4 or higher cannot be reversed.

See also

Overview of the licensing (Page 244)

1.5.5 Setting up a secure connection over HTTPS

Introduction

You can configure the DataMonitor server in such a way that only HTTPS connections are supported.

In this way, you increase the security of your connections.

You need a digital certificate for the DataMonitor server to set up the secure connection.

Requirement

- The Microsoft Windows "Internet Information Service" component is installed.
- WinCC Web Configurator is installed.
- WinCC DataMonitor server is installed.
- A DataMonitor web page has been set up and the Web folder is created.

Creating an SSL certificate

1. Open the "Internet Information Services (IIS) Manager".
2. In the "Connections" navigation area, select the local computer.
The home page of the local computer is displayed in the data area.
3. On the home page of the local computer, double-click "Server certificates" under "IIS".
4. Select "Create a self-signed certificate..." in the "Actions" area.
The "Create a self-signed certificate" dialog opens.
5. Specify the name of the certificate.
6. Select the certificate store "Personal" for the certificate.
7. Confirm your entries with "OK".
The dialog closes.
The certificate has been created.

More information

You can find information on self-signed certificates when using different web browsers on the Internet under Entry ID 109773769:

- SiePortal: "How do you fix problems when using self-signed certificates from WebUX or WebNavigator with different web browsers?" (<https://support.industry.siemens.com/cs/ww/en/view/109773769>)

Setting up a secure connection

1. Open the "Internet Information Services (IIS) Manager".
2. Open the "Sites" folder in the "Connections" navigation area.
3. Select "WebNavigator".
4. Select the "Edit bindings" command in the shortcut menu.
The "Site bindings" dialog opens.
5. Select "Add...".
The "Add site binding" dialog opens.
6. Select the type "https".
7. Specify the required port.
8. Select the created certificate under "SSL certificate".
9. Confirm your entries with "OK".
10. Delete the binding of the type "http" in the "Site bindings" dialog.
11. Exit the configuration with "Close".
12. In the data area "Default Web Site Home", select the "SSL settings" under "IIS".
13. Activate the "Require SSL" option and select the setting for client certificates.
14. To test the connection, enter the URL and the port number in the Internet Explorer or in the WinCC Viewer RT, for example, "https://webserver:444".

See also

SiePortal: "How do you fix problems when using self-signed certificates from WebUX or WebNavigator with different web browsers?" (<https://support.industry.siemens.com/cs/ww/en/view/109773769>)

1.6 WinCC/DataMonitor Release Notes

1.6.1 Notes about DataMonitor

Notes about DataMonitor

These release notes contain important information.

The statements in these release notes take precedence over information provided in the manuals and in the online help.

Please read these release notes carefully as they contain useful information.

Using a secure connection over HTTPS

To improve the security of your communication, configure the DataMonitor server in such a way that only HTTPS connections are supported.

You need a digital certificate for the DataMonitor server for this purpose. Also use SSL certificates on the DataMonitor clients.

You can find more detailed information under "Setting up a secure connection over HTTPS (Page 104)".

System load through large amounts of data

Note that SQL queries returning large amounts of data can affect system functionality.

Select filter criteria which limit the amount of data in a useful manner.

Opening Excel workbooks on a computer not connected to the Internet

If you want to use the DataMonitor client on a computer not connected to the Internet, you must deactivate certificate checking. To do this, follow these steps:

- Open Internet Explorer.
- Select the "Internet Options" command from the "Tools" menu.
- Click "Advanced".
- In the "Security" section, deactivate the setting "Check for publisher's certificate revocation".

Excel workbook functions and print jobs after deactivating and activating WinCC Runtime

If you deactivate WinCC Runtime and then reactivate it, you also need to restart the Web application.

Excel workbook: volume of requested data for archived values

Although you can limit the requested data volume with the "Data resolution" property, all data of the defined time period is initially used internally. This may have the result that the internal system limit is reached. Use compression archives to limit the data volume.

Web Client: Display of ActiveX controls in Internet Explorer

ActiveX controls are disabled in Internet Explorer by default. For this reason, the WinCC controls are not displayed correctly in Internet Explorer on a Web client.

To display the WinCC controls correctly, add the Web server as a trusted website and enable the ActiveX controls only for the "Trusted sites" zone.

To continue protecting Internet Explorer from foreign ActiveX controls, check that the restricted security settings still apply to the other zones after making the changes.

For more information, refer to the following documentation:

- WinCC/DataMonitor: "WinCC/DataMonitor Documentation > Configuring the DataMonitor System > Working with the DataMonitor Client > Configuring Security Settings in Internet Explorer"

DataMonitor server: Remote access to WinCC file server

Remove access from one DataMonitor server to a WinCC file server is possible only if the firewall is disabled on the WinCC file server.

Excel workbook: Local times on DataMonitor client and DataMonitor server

Note when requesting archive data that the local times on the server and client may differ if they have not been sufficiently synchronized, for example because automatic synchronization is not possible.

The DataMonitor client attempts to establish the current time of the DataMonitor server when archive data is requested. If it succeeds, the query will be based on the server time. For the display of data in the Excel table, the time stamp represents the server time but in the local time zone of the client.

If the query of the server time is unsuccessful, the DataMonitor client will base the time period of the query on its local time. An entry will also be made in the Microsoft Windows event display on the DataMonitor client. For the display of data in the Excel table, the time stamp represents the client time.

Excel workbook: Client on terminal server

In the case of operation on a terminal server, an Excel Workbook client will run in a session of the terminal services. A maximum of only 10 Excel workbook clients can be operated; otherwise, MS Excel will overload the computer.

Trends & Alarms: Display of archive data after copying a project

To copy a WinCC project between computers and then display the archive data of the project on the target computer in "Trends & Alarms", you will first need to copy the project using the WinCC Project Duplicator.

If you use Microsoft Windows Explorer rather than the Project Duplicator to copy the project, the runtime data will not be adapted to the target computer. The computer name of the source computer and not that of the target computer is displayed in the archive selection in "Trends and Alarms". The computer name of the target computer is displayed in the selection field only after the archive has been reset in Alarm Logging and Tag Logging.

See also

Setting up a secure connection over HTTPS (Page 104)

1.7 WinCC/WebNavigator Installation Notes

1.7.1 General information on the WebNavigator installation

Scope of delivery

You can find the following components for WinCC/WebNavigator on the WinCC DVD:

- WebNavigator server
- WebNavigator client
- WinCCViewerRT
- WebNavigator diagnostics client
- WinCC Web Publishing Wizard (PublishingWizard)
- WebNavigator Plug-In Builder
- Documentation
- Release notes

Note

WinCC/WebNavigator V8.1: Installation is only released on the basis of WinCC V8.1

You cannot install the V8.1 WebNavigator server/client on a computer with WinCC versions earlier than V8.1.

Nor can a WebNavigator server/client version older than V8.1 be installed on a computer with WinCC V8.1.

Note that mixed use of European and Asian versions of WinCC and WebNavigator is not permitted in the configuration.

1.7.2 WebNavigator installation requirements

1.7.2.1 Hardware and software requirements for WebNavigator

Introduction

This section describes the hardware and operating system requirements for WinCC/WebNavigator.

Notes on the software requirements

Microsoft Internet Information Service (IIS)

During the WinCC installation, the Microsoft Internet Information Service (IIS) is installed and configured.

WinCC client without its own project

A WebNavigator server cannot be operated on a WinCC client without a project of its own.

WebNavigator client

Hardware

	Minimum	Recommended
CPU	Dual core CPU; 2 GHz	Multi core CPU; 3 GHz
Work memory	1 GB	2 GB

Software

Operating system	Microsoft Windows 10 Pro / Enterprise 64-bit Microsoft Windows 10 Enterprise LTSC 64-bit Microsoft Windows 11 Pro / Enterprise 64-bit Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit Also other operating systems via MS Terminal Services Microsoft Windows Embedded Standard 7 including SP1 in combination with SIMATIC IPC 4x7D and SIMATIC IPC 4x7E
Software	Web browser, current version
Other	Access to the intranet/Internet or a TCP/ IP connection to the WebNavigator server

WebNavigator server on a WinCC single-user system

Hardware

	Minimum	Recommended
CPU	Dual core CPU; 2.5 GHz	Multi core CPU; 3.5 GHz
Work memory	2 GB	> 4 GB

Software

Operating system	Microsoft Windows 10 Pro / Enterprise 64-bit Microsoft Windows 10 Enterprise LTSC 64-bit Microsoft Windows 11 Pro / Enterprise 64-bit Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit
Software	Web browser, current version WinCC Basic System V8.1
Other	Access to Intranet/Internet or TCP/IP connection to the WebNavigator client

WebNavigator server on WinCC server or WinCC client with its own project**Hardware**

	Minimum	Recommended
CPU	Dual core CPU; 2.5 GHz	Multi core CPU; 3.5 GHz
Work memory	4 GB	8 GB

Software

Operating system	Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit
Software	Web browser, current version WinCC Basic System V8.1
Other	Access to Intranet/Internet If you wish to publish on the Intranet , you will need a system that converts computer names into IP addresses. This step allows users to use alias names instead of IP addresses when connecting to the server. You will need DNS registration for your IP address if you wish to publish on the Internet . This step allows users to use alias names instead of IP addresses when connecting to the server.

WebNavigator diagnostics client**Software**

Operating system	Microsoft Windows 10 Pro / Enterprise 64-bit Microsoft Windows 10 Enterprise LTSC 64-bit Microsoft Windows 11 Pro / Enterprise 64-bit Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit
Software	Web browser, current version
Other	Access to Intranet/Internet

See also

<https://support.microsoft.com/en-us/kb/3072449> (<https://support.microsoft.com/en-us/kb/3072449>)

1.7.2.2 Licensing WebNavigator

WebNavigator client

No license is required for the PC on which the WebNavigator client is running, as server licenses are available on the WebNavigator server.

WebNavigator server

As a prerequisite for the WinCC basic system, the WinCC RT basic license is required. No WinCC server license is required if no local WinCC clients are to be operated. Even when operating a WinCC client as a dedicated web server, you do not require a WinCC server license for the WinCC client.

Licenses are available for 1 / 3 / 10 / 30 / 100 clients. If you have upgraded a WebNavigator version prior to V7.4, there may also be licenses for 5 / 25 / 50 / 150 clients.

As of WinCC V8.1, there is also an "Unlimited" license for an unlimited number of connected clients.

The packages are version-independent and can be combined. Up to 150 clients can access the WebNavigator server simultaneously.

A message will appear if the number of licensed clients is exceeded during a login attempt by a WebNavigator client. No further logins will be possible.

WinCC/WebUX clients

If the WinCC/WebUX option is also used in the WinCC system, a WebUX client can also occupy a WebNavigator license. This reduces the number of available WebNavigator licenses.

You can find more information in the documentation for WinCC/WebUX.

Test mode

If there is no WebNavigator license or if the license has been removed, the WebNavigator server runs in Test mode.

Test mode runs for a maximum of 21 days from the date of installation. Once 21 days have expired after the installation, the WebNavigator server can only be started with an installed license.

WebNavigator diagnostics client

A "Diagnostics client" license is required on the client computer for the diagnostics client.

The diagnostics client can access on the WebNavigator server in the following cases:

- When the maximum number of simultaneous accesses has been reached on WebNavigator server.
- When no WebNavigator license is installed on the WebNavigator server.

Diagnosics client without corresponding license

If the diagnostics client is installed without the corresponding license, a message will appear about one hour after each start-up of the computer.

Install the diagnostics client license or remove the diagnostics client software.

No access via RDP

Access via Remote Desktop Protocol (RDP) is not enabled for the diagnostics client.

Note

Computer with WinCC basic system and diagnostics client

If you install a diagnostics client on a computer with the WinCC basic system, you will have to reinstall the diagnostics client after removing WinCC.

Overview of licenses for WebNavigator server and client

You can combine WebNavigator and diagnostics licenses.

Server	Client has no license ¹⁾	Client has diagnostics client license ¹⁾
No WinCC license No WebNavigator license	Client in test mode Unlimited number	Client in test mode Unlimited number
WinCC license No WebNavigator license	Client in test mode Unlimited number	Diagnostics client One license per diagnostics client
WebNavigator license No WinCC license	Client in test mode Unlimited number	Client in test mode Unlimited number
WebNavigator license + WinCC license	WebNavigator client Number up to maximum of the server license	Diagnostics client One license per diagnostics client
WebNavigator license + WinCC license + "Load Balancing" license	WebNavigator client Number up to maximum of the server license	Diagnostics client One license per diagnostics client
WebNavigator license + WinCC license + WinCC Redundancy license + "Load Balancing Step-Up" license	WebNavigator client Number up to maximum of the server license	Diagnostics client One license per diagnostics client

1) Note the behavior in test mode. Test mode runs for a maximum of 30 days from the date of installation.

Restarting the WebNavigator client after license modification

If the WebNavigator licenses on the WebNavigator server are modified, e.g. to a different number of clients, Internet Explorer must be restarted on each connected WebNavigator client, and the WebNavigator client must log in again. Otherwise, the WebNavigator client will switch to demo mode. This also applies to automatic reconnection of the WebNavigator client.

Using WebNavigator versions prior to V7.4

WebNavigator versions up to V7.3 do not recognize licenses from WebNavigator V7.4 and higher.

Once you install the current WebNavigator licenses on a computer, a WebNavigator installation of a version prior to V7.4 is no longer licensed.

This also applies if you upgrade to the new cumulative licenses through an upgrade license. The upgraded licenses are no longer recognized by WebNavigator V7.3 or earlier versions.

It is not possible to undo the upgrade to WebNavigator V7.4 or higher.

See also

Overview of the licensing (Page 244)

1.7.2.3 Requirements for the Use of Terminal Services

The WebNavigator client is released for Microsoft Windows Terminal Services.

A maximum of 150 sessions per terminal server are permitted.

Terminal server

Hardware

	Minimum	Recommended
CPU	Dual core CPU; 2 GHz	Multi core CPU; 3 GHz
Work memory	1 GB	2 GB

Note

Memory requirements

Each terminal client will increase the memory requirements and the processor load.

You must therefore ensure that the terminal server has adequate memory and processor load capacity.

Software

Operating system	Microsoft Windows Server 2019 Standard / Datacenter 64-bit Microsoft Windows Server 2022 Standard / Datacenter 64-bit It must be possible to repeatedly call and execute applications that are to be executed on the clients.
Miscellaneous:	If many users want to access the server, you will need to use a high-performance network card.

Terminal client

Minimum requirement:	Network adapter with TCP/IP Terminal client RDP 5.0 Display or monitor Pointing device
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Note**Terminal Services Client Access Licenses (CALs)**

As with Microsoft Windows Server CAL, there are two different CAL terminal services:

- The TS device CAL enables a device to run user-independent Windows sessions on a Microsoft Windows Server.
- The TS user CAL enables a user to run device-independent Windows sessions on a Microsoft Windows Server.

A Microsoft Windows Server Terminal Server CAL "TS CAL" is required for every user or every device.

Additional information can be found in the Microsoft documentation "<https://docs.microsoft.com/en-us/troubleshoot/windows-server/remote/terminal-server-licensing>".

See also

<https://docs.microsoft.com/en-us/troubleshoot/windows-server/remote/terminal-server-licensing> (<https://docs.microsoft.com/en-us/troubleshoot/windows-server/remote/terminal-server-licensing>)

1.7.3 Installing a WebNavigator server

1.7.3.1 Overview: Installing the WebNavigator server

Requirements

- The software requirements for the Microsoft Windows operating system have been met.
- Local administrator rights.
- The WinCC basic system is installed.

NOTICE
WebNavigator server: Using a secure connection over HTTPS
To increase the security of your communication, configure the WebNavigator server in such a way that only HTTPS connections are supported. You need a digital certificate for your WebNavigator server for this.
You can find more detailed information under "Setting up a secure connection over HTTPS (Page 117)".

WinCC options previously installed

If you have already installed other WinCC options prior to the installation of WinCC/ WebNavigator, you may have to re-install these options.

See also

Installing the WebNavigator server (Page 116)

Setting up a secure connection over HTTPS (Page 117)

1.7.3.2 Installing the WebNavigator server

Requirements

- Local administrator rights
- The Internet Information Server is installed.

Procedure

1. Insert the WinCC DVD in the drive.
The DVD starts automatically if Autorun is enabled in the operating system.
If the autorun function is not activated, start the program Setup.exe on the DVD.
2. In the "Installation Type" dialog, select "Package Installation".

3. Select the "WebNavigator Server" installation.
4. Before the installation, the security settings that are adapted for WinCC are displayed in the "System Settings" dialog.
The firewall is configured automatically.
Confirm the changes to the system settings.
5. Start the installation.
You can track the status of the installation in the displayed dialog.
Select "Cancel" to cancel the installation.
6. You can transfer the license key for the product after installation of the WebNavigator server.
To do so, click on "Transfer License Key".
Select "Next" if you have already transferred the license key or want to install it at a later time.

Note

License keys will not be transferred automatically.

You will have to transfer missing license keys during or after installation with "Automation License Manager" .

7. Restart the computer when prompted to do so by setup.

Result

The WebNavigator server is installed and is displayed in the navigation window of the WinCC Explorer.

1.7.3.3 Setting up a secure connection over HTTPS**Introduction**

You can configure the WebNavigator server in such a way that only HTTPS connections are supported.

In this way, you increase the security of your connections.

You need a digital certificate for the WebNavigator server to set up the secure connection.

Requirement

- The Microsoft Windows "Internet Information Service" component is installed.
- WinCC Web Configurator is installed.
- WinCC WebNavigator server is installed.
- A WebNavigator web page has been set up and the Web folder is created.

Creating an SSL certificate

1. Open the "Internet Information Services (IIS) Manager".
2. In the "Connections" navigation area, select the local computer.
The home page of the local computer is displayed in the data area.
3. On the home page of the local computer, double-click "Server certificates" under "IIS".
4. Select "Create a self-signed certificate..." in the "Actions" area.
The "Create a self-signed certificate" dialog opens.
5. Specify the name of the certificate.
6. Select the certificate store "Personal" for the certificate.
7. Confirm your entries with "OK".
The dialog closes.
The certificate has been created.

More information

You can find information on self-signed certificates when using different web browsers on the Internet under Entry ID 109773769:

- SiePortal: "How do you fix problems when using self-signed certificates from WebUX or WebNavigator with different web browsers?" (<https://support.industry.siemens.com/cs/ww/en/view/109773769>)

Setting up a secure connection

1. Open the "Internet Information Services (IIS) Manager".
2. Open the "Sites" folder in the "Connections" navigation area.
3. Select "WebNavigator".
4. Select the "Edit bindings" command in the shortcut menu.
The "Site bindings" dialog opens.
5. Select "Add...".
The "Add site binding" dialog opens.
6. Select the type "https".
7. Specify the required port.
8. Select the created certificate under "SSL certificate".
9. Confirm your entries with "OK".
10. Delete the binding of the type "http" in the "Site bindings" dialog.
11. Exit the configuration with "Close".
12. In the data area "Default Web Site Home", select the "SSL settings" under "IIS".
13. Activate the "Require SSL" option and select the setting for client certificates.
14. To test the connection, enter the URL and the port number in the Internet Explorer or in the WinCC Viewer RT, for example, "https://webserver:444".

See also

General information about WebNavigator (Page 130)

SiePortal: "How do you fix problems when using self-signed certificates from WebUX or WebNavigator with different web browsers?" (<https://support.industry.siemens.com/cs/ww/en/view/109773769>)

1.7.4 Installing the WebNavigator client

1.7.4.1 Installing the WebNavigator client

Introduction

You can install the WebNavigator client as follows:

- Installation from the WinCC product DVD.
In this case, certain Microsoft Windows user rights are required, depending on the operating system.
- Installation via the Intranet/Internet.
In this case, certain Microsoft Windows user rights are required, depending on the operating system.
- Installation without user interaction:
 - Using the Microsoft Windows user rights of the current user
 - Or in networks, using group policy-based software distribution

In addition, you can also install the WebNavigator client on the WebNavigator server.

This is useful, for example, if you want to check the WinCC project locally on the server in Internet Explorer.

Remote communication

If the WebNavigator client is not running on the same computer as the WebNavigator server, enable remote communication on both computers in the "Simatic Shell" dialog.

Note

.Net controls on the WebNavigator client

If you wish to use .Net controls on the WebNavigator client, you need to install the .Net Framework 4.0 or higher on the client from the WinCC product DVD.

The .Net controls must not be copied to the Microsoft Windows "Common Files" folder. Instead, use the following path:

- <Installation directory>WinCC\WebNavigator\Client\bin
-

Note

Parallel installation of WinCC/WebNavigator client and WinCC Runtime Advanced

Avoid the installation of the web client on a PC on which WinCC Runtime Advanced is installed as well.

If you run both installations on the same PC, you require administrator rights in order to work with the web client. No pictures are loaded into the web browser without administrator rights.

WinCCViewerRT

The web viewer "WinCCViewerRT" is installed upon installation of the WebNavigator client.

Procedure

1. Entry and check of the settings of the client computer in Internet Explorer.
2. Installation of the WebNavigator client.

Note

If you are installing from the DVD or using software distribution based on group policy, you can directly upgrade an older version of the WebNavigator client without having to remove the older client first.

If you install the WebNavigator server on a PC after the WebNavigator client, you will have to install the client again.

Plug-in reinstallation

The plug-ins "User Archive Control", "FunctionTrend Control", "Hard Copy" and "Web Client" are already integrated in the WebNavigator client as of version V7.0 upon installation.

If a WebNavigator client as of V7.0 is connected to a WebNavigator server older than V7.0 (e.g. V6.2 SP3), you will be offered these plug-ins for installation in the download area of the Web navigation user interface.

The plug-ins are already installed. Do not reinstall these plug-ins.

Information on the setup and installation of the WebNavigator client:

- Before downloading and installing a new version on the WebNavigator client, check the languages installed on the client and connected server.
Only the languages of the connected server will be available on the client computer following client installation by download.
- WebNavigator client setup will be interrupted with the error message "WinCC Active" if the local WinCC project is open or has been opened since the PC was last restarted.
Restart the computer.
Check whether WinCC has been included in the Autostart directory.
Remove the entry if necessary and then restart the computer to execute WebNavigator client installation.

- You will need at least 70 MB of free memory space on the local hard disk to install the WebNavigator client.
Otherwise, the MSI setup will cancel installation with a corresponding error message.
- When installing the WebNavigator client by downloading it from the Intranet/Internet, you can select to either "Open" or "Save" the setup file.
The procedure you select upon initial installation of the WebNavigator client must also be selected for the subsequent installation of plug-ins or ActiveX controls. Otherwise, the "MSI Installer" service will output the error message "Error 1316".
- Prior to installation via download, the latest cumulative security update for Internet Explorer must be installed.
Information on the installation of ActiveX controls: Microsoft entry KB3072449 (<https://support.microsoft.com/en-us/kb/3072449>).
- WebNavigator client on a 64-bit PC:
The required Microsoft Visual C++ Redistributable must be installed on the WebNavigator client before the connection to the WebNavigator server is established. This installation is a requirement for the Web client.
Use the link that is displayed during installation via intranet/Internet.

Note**Installation of Microsoft Visual C++ Redistributable in domain environments**

The required Visual C++ Redistributable must also be available for domain environments as an "msi" package:

- If the WebNavigator client on the 64-bit computer is not upgraded to the latest version via the DVD, "Webnavigatorclient.msi" and "WebNavigatorClient_x64_AddOn.msi" can be made available to the user via the domain controller.
- If the WebNavigator clients on the 64-bit computers are integrated in domain group policies, the users of the clients must install "WebNavigatorClient_x64_AddOn.msi" themselves.

-
- In the download area of the Web Navigation user interface, the Plug-Ins which can be installed are displayed.
The same minimum user rights are required for installing these plug-ins as for installation of the WebNavigator client.
If you select a plug-in in the Web Navigation user interface, WebNavigator client setup will start. You will have to confirm the selected plug-in again.

Upgrading the WebNavigator client from a previous version

When you connect a web client to a web server, it is tested whether the client has the same version installed as on the web server.

If an older version is present, you can upgrade the WebNavigator client when accessing the Web project.

Upgrade from WinCC V6.2 SP3

Perform a repair installation after upgrading from WinCC V6.2 SP3.

Start the WinCC/WebNavigator client installation in the Control Panel via "Uninstall or change a program" and select "Repair".

Otherwise, controls may be reinstalled during operation.

Restart the computer.

Installation of the WebNavigator client under Microsoft Windows Server

Installation of the WebNavigator client under Microsoft Windows Server with a lower user authorization than "Administrator" is not possible with the default setting of group policies.

Enable the installation of the WebNavigator client in the group policy by

- Assigning and making the software public
- Or activating the setting "Always install with elevated privileges" under "Administrative Templates / Windows Components / Windows Installer".
You must activate "Never" for the "Deactivate Windows Installer" option.

WinCC/WebNavigator: Central installation on web clients

For an installation without user interactions on a web client start the setup via the following command line:

- Installation with default settings:

```
msiexec /i C:\TEMP\WebnavigatorClient.msi /quiet /log  
C:\temp\installWebNav.log
```
- Installation with reduced user interface:

```
msiexec /i C:\TEMP\WebnavigatorClient.msi /qb /log  
C:\temp\installWebNav.log
```

See also

The "Central installation" function (Page 47)

<https://support.microsoft.com/en-us/kb/3072449> (<https://support.microsoft.com/en-us/kb/3072449>)

1.7.4.2 User rights and user groups for WebNavigator clients

Microsoft Windows user rights required for installation and initial registration of the WebNavigator client

"Administrator" rights are required for installing the WebNavigator client via Intranet/Internet or using the product DVD. The initial registration of the client on the WebNavigator server must take place with the user identification used during installation and the same or higher Windows user rights. The connections must be established successfully. All subsequent logins can then be performed by users with different Windows user rights, which may be more restricted.

Microsoft Windows user groups "SIMATIC HMI" / "SIMATIC HMI VIEWER"

Following WinCC installation, WinCC automatically establishes the following local groups in Microsoft Windows User and Group Administration:

SIMATIC HMI	These members can create local projects, and can process, start, and access these projects remotely. Access to the WinCC database is limited to the minimum rights necessary (read/write).
SIMATIC HMI Viewer	These members have read access only to configuration and runtime data in the WinCC database.

In the following cases, you need to add users of the WebNavigator client to a Microsoft Windows user group:

- The WebNavigator client is installed on a PC on which WinCC is already installed: Users of the Web client must be members of the user group "SIMATIC HMI VIEWER" or "SIMATIC HMI".
- The WebNavigator client accesses the WebNavigator server as "Remote Desktop" user: Users of the Web client must be members of the user group "SIMATIC HMI VIEWER".

Installing the WebNavigator client with limited Microsoft Windows user rights

The MSI technology used allows you to install the WebNavigator client even with limited Windows user rights. This procedure can be set during the installation using the group policy based software distribution in networks.

Even the add-ins and plug-ins for the WebNavigator client can be installed. "Administrator" rights are required for the installation of plug-ins that were created with the WinCC Plug-In Builder.

Installation for a configured group of users or computers

Using the Microsoft Systems Management server or group policy on a Domain Controller, it is possible to install a group of users or computers configured by the Administrator.

- For this the MSI file "WinCCWebNavigatorClient.msi" is published at the Domain Controller and enabled for a user group. Installation is then performed either during login of the defined users or when the computer is started, depending on the configuration of the group policy-based software distribution.
- When using a Microsoft Systems Management Server, the installation is configured by the administrator, triggered and executed when the relevant computer boots.

Group policy-based software distribution

Software is normally installed with the access rights of the current Microsoft Windows user. When using MSI technology, the installation is performed by an operating system service with a higher level of rights. This enables installations for which the Windows user does not have the necessary rights. Applications which require higher rights for installation are referred to as "privileged installations" in MSI technology. Installation of these applications is possible when a Windows user is assigned the "Always install with elevated privileges" permission.

A group policy is created in the domain controller for use of group policy-based software distribution. The software to be distributed is then assigned or made public using Active Directory.

- **Assignment:** Software distribution can be assigned to a user or a computer. The software to be distributed is automatically installed when the user logs in or the computer is started.
- **Publication:** The software distribution can be published for individual users. When the user logs on to the client computer, the software to be distributed appears in a dialog and can be selected for installation.

1.7.4.3 Settings in the web browser (WebNavigator client)

Introduction

You have to adapt the web browser security settings in order to utilize the full functionality of the WebNavigator client.

The procedure depends on the browser used and is described using the example of the "Internet Explorer" browser.

Procedure

1. Click "Tools > Internet Options" in Internet Explorer.
2. Select the "Security" tab.
Select the corresponding zone, for example, "Local Intranet" or "Internet".
3. Click "Custom Level...".
4. Enable the "Script ActiveX controls marked safe for scripting" and "Download signed ActiveX controls" options.
5. Enable "Active Scripting" under "Scripting".
6. Click "OK". Carry out the modifications in the subsequent dialog.
7. Click the "Trusted Sites" icon.
Click the "Sites..." button to open the "Trusted sites" dialog.
8. Enter the address of the WebNavigator server in the "Add this website to the zone" field.
Possible formats and wildcards include "*://157.54.100 - 200", "ftp://157.54.23.41", or "http://*.microsoft.com".
Deactivate the "Require server verification (https:) for all sites in this zone" option.
Click "Add". Click "OK".
9. Click the "Trusted Sites" icon.
Click the "Standard level" button and then the "Custom Level" button.
Enable "Initialize and script ActiveX controls not marked as safe". Click "OK".
10. Click on the "General" tab.
Click in the "Settings" area on the "Temporary Internet Files" button.
Enable the "Automatic" option under "Check for newer versions of stored pages:".
Click "OK".
11. Close the "Internet Options" dialog by clicking "OK".

See also

- Hardware and software requirements for WebNavigator (Page 109)
- General information about WebNavigator (Page 130)
- Notes on Internet Explorer for WebNavigator (Page 138)

1.7.4.4 Installation from the DVD (WebNavigator client)

Requirements

- For the installation and use of the WebNavigator client, the information in Settings in the web browser (WebNavigator client) (Page 124) applies.
- Depending on the operating system, specific minimum user rights are required to install the WebNavigator client; see User rights and user groups for WebNavigator clients (Page 122).

Procedure

1. Insert the WinCC DVD in the drive.
The DVD starts automatically if Autorun is enabled in the operating system. If the Autorun function is not activated, start the program Setup.exe on the DVD.
2. In the "Installation Type" dialog, select "Package Installation".
3. Select the "WebNavigator Client" program package.
4. Before the installation, the security settings that are adapted for WinCC are displayed in the "System Settings" dialog. The firewall is configured automatically. Confirm the changes to the system settings.
5. Start the installation. You can track the status of the installation in the displayed dialog. Select "Cancel" to cancel the installation.
6. Restart the computer when prompted to do so by setup.

Result

The WebNavigator client is now installed and has been added as a function to the navigation window of the WinCC Explorer.

1.7.4.5 Installation via the Intranet/Internet (WebNavigator client)

Requirements

- For the installation and use of the WebNavigator client, the information in Settings in the web browser (WebNavigator client) (Page 124) applies.
- Depending on the operating system, specific minimum user rights are required to install the WebNavigator client; see User rights and user groups for WebNavigator clients (Page 122).

1.7 WinCC/WebNavigator Installation Notes

- The WebNavigator server must be installed on a computer:
 - The Internet Information Server must be configured with the WinCC Web Configurator.
 - The users must be registered in the WinCC User Administrator.
 - The WinCC project must be in runtime.
- The latest cumulative security update for Internet Explorer must be installed. This applies to all installed versions of Internet Explorer. Information on the installation of ActiveX controls: Microsoft entry KB3072449 (<https://support.microsoft.com/en-us/kb/3072449>).
- The required Microsoft Visual C++ Redistributable must be installed on the WebNavigator client with a 64-bit computer before the connection to the WebNavigator server is established.

Procedure

1. Enter the address of the WebNavigator server in the address bar of the Internet browser, e.g. the IP address.
For installation in a virtual directory, the URL can be as follows:
 - "https://www.servername/WebNavigator/"
2. Type in the user name and password.
3. The first time you access the WebNavigator server, you will be prompted to install the WebNavigator client.
If the client is a 64-bit computer, an additional link is displayed in order to install the required "Visual C++ Redistributable".
This installation is a requirement for the Web client.
4. Click on the "WinCC WebNavigator client" link.
Click the "Save" button in the "File download" dialog to store the client setup on the target computer.
It is recommended to save the Setup file because, in the event of a restart of the client computer being necessary, the Setup need not be downloaded again.

Note

Installing Visual C++ Redistributable

If you have installed the WebNavigator client without first installing the Visual C++ Redistributable, you can install the software later.

Select the menu "Web Navigator and System Updates" in the "download area" of the Navigation user interface of "MainControl.asp".

If you have already installed the WebNavigator client and wish to install a more recent version via intranet/Internet, open the client setup straight away. You do not need to save the installation file on the target computer. Remove the old installation file first if you wish to save the new one. Alternatively, you can save the new version of the file in a different directory.

5. Leave the Internet Explorer open and open Microsoft Windows Explorer. Navigate to the directory in which you saved the setup file. Start setup by double-clicking on the file.
6. Follow the instructions on the screen and enter the information and settings necessary. The client-side controls of the WebNavigator will be installed. Close the Setup dialog.

Result

Following successful installation, the WebNavigator client connects to the WinCC project currently in runtime.

Note

Virtual keyboard: .net installation

If you want to use the on-screen keyboard, you also have to install .net 4.0 or higher.

If you install the WebNavigator client from the WinCC DVD, .net 4.0 is already included.

See also

<https://support.microsoft.com/en-us/kb/3072449> (<https://support.microsoft.com/en-us/kb/3072449>)

1.7.5 Installing the WebNavigator diagnostics client

Introduction

The software for the WebNavigator diagnostics client is installed on the client computer from the DVD.

Requirements

- To do this, you must have administrator rights.
- Access via Remote Desktop Protocol (RDP) is not enabled for the diagnostics client.

Procedure

1. Insert the WinCC DVD in the drive.
The DVD starts automatically if Autorun is enabled in the operating system.
If the Autorun function is not activated, start the program Setup.exe on the DVD.
2. In the "Installation Type" dialog, select "Custom Installation".
3. Select the "Diagnostics Client" program in the "Web Navigator" program group.

1.7 WinCC/WebNavigator Installation Notes

4. Before the installation, the security settings that are adapted for WinCC are displayed in the "System Settings" dialog. The firewall is configured automatically. Confirm the changes to the system settings.
5. Start the installation.
You can track the status of the installation in the displayed dialog. Select "Cancel" to cancel the installation.
6. Restart the computer when prompted to do so by setup.

Result

The WebNavigator diagnostics client is now installed.

1.7.6 WebNavigator Demo Project

Introduction

The WinCC Demo Project can be downloaded as a self-extracting ZIP file from:

- SiePortal: WinCC demo projects (search) (<https://support.industry.siemens.com/cs/products?search=demo&ntp=ExampleOfUse&o=DefaultRankingDesc&pnid=14867&lc=en-WW>)

Installation

To install the project, copy the file in a local target directory and start the decompressing process by double-clicking the file.

The following logins are already configured in the demo project:

WinCC	Logon	Password
Demo User German	winccd	winccpass
Demo User English	wincce	winccpass

See also

SiePortal: WinCC demo projects (search) (<https://support.industry.siemens.com/cs/products?search=demo&ntp=ExampleOfUse&o=DefaultRankingDesc&pnid=14867&lc=en-WW>)

1.7.7 Uninstalling the WebNavigator

Introduction

You can remove the WebNavigator server and WebNavigator client in the usual way, as in Microsoft Windows.

Procedure: Uninstalling via the WinCC Product DVD

1. Start the WinCC product DVD.
The DVD starts automatically if Autorun is enabled in the operating system.
If the Autorun function is not activated, start the Setup.exe program on the DVD.
2. Follow the on-screen instructions.
3. Select "Remove" as the setup type.
4. Select the components that you want to remove.

Alternative procedure: Uninstalling via the Control Panel

1. Open the "Uninstall or change a program" dialog in the Microsoft Windows Control Panel.
2. Select the WebNavigator server or client and click "Remove".
Follow the instructions on the screen.

Result

The WebNavigator Server or WebNavigator client has now been removed from the computer.

1.8 WinCC/WebNavigator Release Notes

1.8.1 General information about WebNavigator

Introduction

These release notes contain important information.

The statements in these release notes take precedence over information provided in the manuals and in the online help.

Read these release notes carefully as they contain useful information.

Notes on the security of the system

Cybersecurity information

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept.

Siemens' products and solutions constitute one element of such a concept.

You can find additional information about industrial cybersecurity under:

- <https://www.siemens.com/cybersecurity-industry> (<https://www.siemens.com/cybersecurity-industry>)

Security restrictions with the WebNavigator client

NOTICE
Security restrictions and response times in Internet Explorer
Please note the Internet-specific security restrictions when using the WebNavigator client.
The WebNavigator client may take significantly longer (>20 seconds) than a regular WinCC client to recognize that the WebNavigator server is down or that the communication is faulty.

Using a secure connection via HTTPS

To increase the security of your communication, configure the WebNavigator server in such a way that only HTTPS connections are supported.

You need a digital certificate for the WebNavigator server for this. Also use the SSL certificate on the WebNavigator client.

You can find more detailed information under "Setting up a secure connection via HTTPS (Page 117)".

Communication via proxy server

When communicating through a proxy server, the following applies:

- The WebNavigator client must be a member of the server domain.
- If the users registered on the WebNavigator client have no access to the proxy server, logon to the proxy server with NTLM authentication is as follows:
 1. The logon dialog for the proxy server appears.
 2. The logon dialog for the WinCC user appears.
 3. The logon dialog for the proxy server appears again.

Avoid cross-site request forgery for the WebNavigator

Cross-site request forgery is similar to the vulnerability caused by cross-site scripting (XSS, Cross Site Scripting).

The attack is triggered when an authenticated user clicks on a malicious link. However, this vulnerability also works if the user has disabled scripting in the browser.

Siemens recommends:

- Do not work with other applications or services that have anything to do with the Internet.
- Log off when you no longer need the WebNavigator.

Defense in depth

Follow the instructions on "Industrial Cybersecurity" on the Siemens website:

- <http://www.siemens.com/industrialsecurity> (<http://www.siemens.com/industrialsecurity>)

WebNavigator server: Do not configure the standard port "80"

When configuring the port in the WinCC Web Configurator, use "8080", for example, rather than the standard port "80".

General information about WebNavigator

Project Change

Following a change of projects, a sporadic inoperable period of the Internet Information Services (IIS) may occur.

The computer must then be restarted.

Terminal server: Login with user certificate

The following group policy affects the logon behavior of a user with a user certificate:

Local group policy	Setting
Computer Configuration > Windows Settings > Security Settings > Local Policies > Security Options: "System cryptography: Force strong key protection for user keys stored on the computer"	User must enter a password each time they use a key

This setting can cause the password prompt for the user certificate to be displayed in the session of another logged-on user when the terminal session is established.

Corrective measure

To prevent this Windows behavior, use the default setting "Not defined" on the system that is used as the terminal server.

This behavior occurs only when this group policy is activated.

Custom ActiveX controls (Industrial X)

Compatibility with WinCC and WebNavigator server or WebNavigator client must be ensured if custom ActiveX controls (Industrial X) are used:

- Direct installation of the ActiveX control on the computer with WinCC and WebNavigator server or client.
You must install the ActiveX control before installing WinCC and the WebNavigator server or client.
If the ActiveX control does not function without errors after this step, there is no compatibility.
- Installation as a plug-in via the Web Navigation user interface on the WebNavigator client.
If the ActiveX Control is packaged in a plug-in and installed via download, an upgrade of WinCC and the WebNavigator server or client will also require the generation of a new plug-in using this ActiveX control.
Ensure compatible binaries (DLL, OCX, etc.) are used when creating the plug-in.

Visual C++ Redistributable for Visual Studio

Microsoft Redistributable Packages for Visual Studio C++ 2015 are installed along with WinCC.

For example, if you are using ActiveX controls or Visual Basic projects created with versions prior to Visual Studio 2015, you must install the corresponding package.

The installation files for redistributables < Visual Studio 2015 are included in the WinCC scope of delivery:

- "Additional Content" DVD:
"VCRedist" folder

Select the setup for the required version:

- 2005x86 / 2005x64
- 2008x86 / 2008x64

- 2010x86 / 2010x64
- 2012x86 / 2012x64

See also

Settings in the web browser (WebNavigator client) (Page 124)

Setting up a secure connection over HTTPS (Page 117)

<https://www.siemens.com/cybersecurity-industry> (<https://www.siemens.com/cybersecurity-industry>)

<http://www.siemens.com/industrialsecurity> (<http://www.siemens.com/industrialsecurity>)

1.8.2 Notes on WebNavigator installation

Notes on installation

Uninstalling WinCC: WebNavigator client must be installed later

If you uninstall WinCC, you will need to post-install the WebNavigator client.

Message after installation of a plug-in

The Program Compatibility Wizard may possibly output a message during installation of a plug-in.

The plug-in is installed correctly.

Therefore, confirm this message with "The program was installed correctly."

WebNavigator client: WinCC Computer with "Basic Process Control"

The plug-in "WinCC Basic Process Control" must be installed on the WebNavigator client if the client is connected to a computer with WinCC Basic Process Control.

Without the plug-in, the functionality of WinCC Basic Process Control will not be available on the WebNavigator client. For example, the relevant ActiveX controls and the group display will not be available.

Installing the plug-in

The plug-in is located on the WebNavigator server in the folder
<wincc_installationpath>"WebNavigator\Server\Web\Install\Custom".

You can download the plug-in via the WebNavigator navigation user interface from the download area.

A description of the functions supported/not supported can be found in the WinCC Information System:

- "Options for Process Control > Overview of process control system options > Configuration in the PCS 7 environment > Web client"

Dedicated Web server with WinCC Basic Process Control

If the WebNavigator client is to be installed on a dedicated web server with WinCC Basic Process Control, the plug-in "WinCC Basic Process Control" must be installed immediately after installation of the WebNavigator client.

The download page for the plug-in is displayed. You will only be able to exit this page after installation of the plug-in for displaying the process pictures.

For more information on the supported functionalities of the WebNavigator client when connected to a PCS 7 OS, please refer to the PCS 7 documentation.

WebNavigator server: User WNUSR_DC92D7179E29

After the installation of the WinCC/WebNavigator server, the user "WNUSR_DC92D7179E29" is created during the initial configuration with the WinCC Web Configurator.

The user is only used internally. To maintain the functioning of the Web server, do not delete or modify this user.

To increase the security of the system, change the password for the user on a regular basis. To do this, use the tool "CCSetWebNavPwd.exe".

You can find more information in the documentation for WinCC/WebNavigator:

- "WinCC/WebNavigator Documentation > Configuring the WebNavigator system > Configuring the WebNavigator Server > Configuring the WebNavigator web page > WinCC Web Configurator"

Setting a password for the configuration

To define your own password before configuration, you can create a temporary key in the PC's registry.

You can find more information in the "Industry Support Siemens".

1.8.3 General notes on WebNavigator client

Notes on the web client

Security restrictions with the WebNavigator client

NOTICE
Security restrictions and response times in Internet Explorer
Please note the Internet-specific security restrictions when using the WebNavigator client. The WebNavigator client may take significantly longer (>20 seconds) than a regular WinCC client to recognize that the WebNavigator server is down or that the communication is faulty.

Microsoft Windows Server operating system: Loading process pictures in WinCCViewerRT

It is possible that the web client does not display any process pictures in WinCCViewerRT on PCs with the "Microsoft Windows Server 2016 / 2019 / 2022" operating systems.

Check the settings of the web client:

1. To display the icons in the control panel, select, for example, "Small icons" in the "View by" drop-down list.
2. Click the "Internet options" entry.
The property dialog opens.
3. Deactivate the following entry in the "Advanced" tab in the "Security" area:
 - Do not save encrypted pages to the disk
4. Close the dialog with "OK".

Changing setting via group policy

If you manage the web clients via group policies, follow these steps:

1. To open the editor for local group policies, enter "gpedit.msc" in the Microsoft Windows search field.
2. Select the following entry in the navigation area:
 - Computer configuration > Administrative templates > Windows components > Internet Explorer > Internet control system > "Advanced" PageTo sort the list alphabetically, click the column header "Setting".
3. Double-click "Do not save encrypted pages to disk".
4. Select the "Disabled" or "Not Configured" option.
5. Close the dialog with "OK".

WebNavigator client: Firewall settings for printing from WinCC controls

To be able to print out on the client, you need to define the following Firewall settings for the profiles used:

1. Open "Control panel > System and security > Windows firewall".
2. In the navigation bar, click "Allow a program or feature through Windows Firewall".
3. In the "Allowed programs and features:" list, activate the entry "File and printer sharing" for the relevant profile.
4. Return to the Windows Firewall home page.
5. In the navigation bar, click "Turn Windows Firewall on or off".
6. If the firewall is enabled, disable the setting "Block all incoming connections, including those in the list of allowed programs".

WebNavigator client: ODK function "PWRTCheckPermissionOnPicture"

In order to use the ODK function "PWRTCheckPermissionOnPicture" on a WebNavigator client, install the plug-in "WinCC Basic Process Control" and "Advanced Process Control".

WebNavigator client: WinCC Alarm Control on a WebNavigator server in WinCC ServiceMode

Initial Situation

The WebNavigator client is connected with a WebNavigator server operated in WinCC ServiceMode.

Behavior

If you are using WinCC Alarm Control prior to WinCC V7 that is connected via a server prefix, you will not be able to open the selection dialog.

Solution

Use the WinCC AlarmControl that is offered as of WinCC V7.

WebNavigator client: Diagnostics file "WebNavReconnect.log"

After installation of the WebNavigator client, the diagnostics file "WebNavReconnect.log" is saved in the folder "<User>\Application Data\LocalLow\Siemens\SIMATIC.WinCC\WebNavigator\Client".

The diagnostics file will be saved into the respective user profile so that this user no longer requires administrator rights.

WebNavigator client: Control "WinCC Channel Diagnosis"

You cannot use the "WinCC Channel Diagnosis" Control on a web client without WinCC installation.

WebNavigator client: "FLAG_COMMENT_DIALOG" of the "GCreateMyOperationMsg" function

The WebNavigator client does not support the parameter "FLAG_COMMENT_DIALOG" for the "GCreateMyOperationMsg" function.

WinCC/ODK: SSMRT functions in the web client

The "SSMRT" functions of the Split Screen Manager do not work in the WebNavigator client.

Instead, use the appropriate "SSM" function.

The "SSMRTOpenTopFieldEx" ODK function is not available in the WebNavigator client.

Example

The following script checks the environment and can thus be called in the WebNavigator client and in WinCC Runtime.

```
void OnClick(char* lpszPictureName, char* lpszObjectName, char* lpszPropertyName)
{
    #pragma code("ssmrt.dll")
        #include "ssmrt.h"
    #pragma code()
    char szFullTopfieldPath[MAXFULLPATHLEN] = { 0 };
    long lBufferLen = MAXFULLPATHLEN;
    OPENTOPFIELDSTYLE MyStyle;
    CMN_ERRORA Err;
    BOOL bResult;
    DWORD dwTopfieldStyle = 0;
    long lTopfieldUsed;
    #ifndef RUN_ON_WEBNAVIGATOR
        MyStyle.bAdaptSize = TRUE;
        bResult = SSMRTOpenTopFieldEx (SSMGetScreen(lpszPictureName), "PictureA.pdl",
szFullTopfieldPath, lBufferLen, &MyStyle, &Err);
    #else
        // Declaration of _SSMOpenTopField3:
        //      BOOL _SSMOpenTopField3 (TCHAR Screen, TCHAR* PictureName, DWORD dwStyle,
TCHAR* retPictureName, DWORD dwReturnPathLen, long* plTopfieldUsed, LPCMN_ERROR Err, long
lXPos, long lYPos, BOOL bDefaultPos)
        // dwTopfieldStyle can be 0, TOP_FIELDFIXEDSIZE, TOP_ATTACHTOWORKFIELD, or
TOP_FIELDFIXEDSIZE + TOP_ATTACHTOWORKFIELD
        dwTopfieldStyle = TOP_FIELDFIXEDSIZE;
        bResult = _SSMOpenTopField3 (SSMGetScreen(lpszPictureName), "PictureA.pdl",
dwTopfieldStyle, szFullTopfieldPath, lBufferLen, &lTopfieldUsed, &Err, 0, 0, TRUE);
    #endif
}
```

1.8.4 Notes on Internet Explorer for WebNavigator

Notes on Internet Explorer

Security settings in Internet Explorer: Installation via SSL connection

If you want to download the WebNavigator from an ASP portal via an SSL connection, note that the download is not possible under certain conditions.

You can correct this with one of the following settings:

- Deactivate the "Do not save encrypted pages to disk" option in the "Advanced" tab for the Internet options of the Internet Explorer.
- Deactivate the "Internet Explorer Enhanced Security Configuration" option in the "Control Panel/Add/Remove Programs/Windows Components".

WebNavigator server: Display virtual folder in Internet Explorer

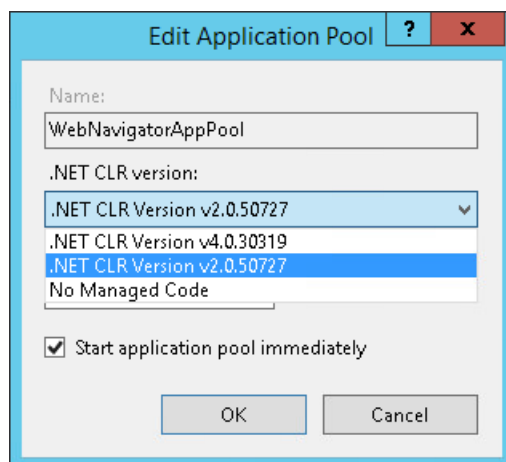
Note the following when using Internet Explorer as WebNavigator browser:

To add a virtual folder to an existing website, create this website in a subdirectory of the drive.

When the website is created in the root directory, e.g. under D:\, Internet Explorer may not show the contents of the virtual folder.

To always display the contents, change the .NET settings in the IIS:

1. Open the Internet Information Services (IIS) Manager.
2. In the navigation, click on the entry "Application pools".
3. In the shortcut menu of "WebNavigatorAppPool", select the "Basic settings" entry.
4. In the ".NET CLR version" list, select the .NET version "v2", for example:



WebNavigator client: Display of ActiveX controls in Internet Explorer

ActiveX controls are disabled in Internet Explorer by default.

For this reason, the WinCC controls are not displayed correctly in Internet Explorer on a WebNavigator client.


To display the WinCC controls correctly, add the Web server as a trusted website and enable the ActiveX controls only for the "Trusted sites" zone.

To continue protecting Internet Explorer from foreign ActiveX controls, check that the restricted security settings still apply to the other zones after making the changes.

For more information, refer to the following documentation:

- WinCC/WebNavigator: "WinCC/WebNavigator Installation Notes > Installation of WebNavigator Client > Settings in the web browser (WebNavigator client) (Page 124)"

WebNavigator client: Updating pictures with faceplates

To display changed faceplates in process pictures, refresh the view of the web client in the browser, e.g. with <F5> or using the  button.

See also

Settings in the web browser (WebNavigator client) (Page 124)

1.9 WinCC/WebUX

1.9.1 WebUX licensing

The WinCC/WebUX basic package with an integrated WinCC WebUX Monitor license is included in WinCC.

WebUX client

The WebUX clients are licensed on the WebUX server.

No license is required for the WebUX client on the computer.

WebUX server

The WebUX server is installed on a WinCC system. The WinCC basic system requires at least the WinCC basic RT license.

The license keys are differentiated as described below and run in parallel on the WinCC/ WebUX server:

License ¹⁾	Function	Comments
WinCC WebUX Monitor	The user has only read access.	The authorization level 1002 "Web access - monitoring only" is configured for the user in the User Administrator. If the available "Monitor" licenses have been allocated, an "Operate" license can also be allocated to a WebUX client for read access.
WinCC WebUX Operate	The user has read and write access.	
WinCC/WebNavigator	The user's authorizations determine whether write access is possible in addition to read access.	

1) If a WinCC/WebNavigator license is also installed in the WinCC system, the WebNavigator license can also be allocated to a WebUX client.

To do so, the following option must be enabled in the WebNavigator dialog "WinCC Web settings":

- "Allow WebUX to use the WebNavigator licenses".

First, however, all available WebUX licenses are used.

License packages

The license packages are available with 1, 3, 10, 30 and 100 clients.

If you have upgraded from WebUX V7.3, there may also be licenses for 5 / 25 / 50 / 150 clients.

As of WinCC V8.1, there is also an "Unlimited" license for an unlimited number of connected clients.

If the number of licensed clients is exceeded during the logon attempt by a WebUX client, no further logon is permitted.

The packages are version-independent and can be combined.

WebUX demo license

With WinCC/WebUX you also receive a demo license for accessing the WebUX server.

This allows a maximum of one user without a valid WebUX license or WebNavigator license to have read access to the project.

Reserved license

A reserved WebUX license always gives the user guaranteed access to the WebUX server.

A connection remains reserved for the user. The number of freely available WebUX licenses is reduced by each configured reserved license.

Applications

Possible applications include:

- Remote operator access:
If the connections to the WebUX server are occupied by read-only access, a connection remains reserved for operation.
- Central display:
Central client stations are always connected, for example, to display the status of the WinCC system.

Reserving WebUX licenses

In the User Administrator, you assign one of the available licenses to a WebUX user as a reserve license.

To do this, enable the "Reserve WebUX license" option for the user. The field "WebUX Number of reserved licenses" shows how many WebUX licenses are assigned through reservation.

Reserved licenses cannot be configured for user groups, only for individual users.

If more reserved licenses are configured than those available on the WebUX server, the licenses of the first users logged on are used.

Using WebNavigator licenses

You can also use WebNavigator licenses for WebUX clients.

To enable licenses for WebUX clients, open the "WinCC Web settings" dialog in the shortcut menu of the "WebNavigator" editor in the WinCC Explorer.

In the "Runtime" tab, enable the "Allow WebUX to use the WebNavigator licenses" option.

Administering clients in runtime

To identify inactive clients and to disconnect them, if necessary, use the page "`http://<servername>/status.html`".

1.9 WinCC/WebUX

You can find further information in the documentation of the WinCC/WebNavigator option under:

- WinCC/WebNavigator documentation > Operating a WinCC project > Diagnosis of the Connections with "Status.html"

See also

Installation of WebUX (Page 142)

1.9.2 Installation of WebUX

Software requirements

Certain requirements concerning operating system and software configuration must be met for the installation.

WebUX server: Operating system

Software	Configuration	Comments
Microsoft Windows 10	Pro Enterprise	Standard installation 64-bit A maximum of 9 WebUX clients can connect to the WebUX server. ¹⁾
Microsoft Windows 10	Enterprise LTSC (Long-Term Servicing Channel)	Standard installation 64-bit A maximum of 9 WebUX clients can connect to the WebUX server. ¹⁾
Microsoft Windows 11	Pro Enterprise	64-bit A maximum of 9 WebUX clients can connect to the WebUX server. ¹⁾
Microsoft Windows Server 2019	Standard Datacenter	64-bit
Microsoft Windows Server 2022	Standard Datacenter	64-bit

1) Only a limited number of connections is possible:

The maximum number of WebUX clients depends on the number of connections that the IIS supports on the installed Microsoft Windows version.

The number of available connections can decrease if other applications access these connections, e.g. WinCC/WebNavigator. In the Microsoft Windows system monitor, use the "Performance Monitor" application to analyze the connection status.

Additional software requirements

	Version / setting	Relevant for	Comments
Web browser	The browser must support HTML5.	WebUX client / terminal	WebUX can be used with any browser. The display is optimized for the Chrome browser.
WinCC version	WinCC V8.1	WebUX server	The WebUX server is installed on a WinCC system.
SIMATIC Logon version (optional)	SIMATIC Logon V2.0	WebUX server	Only relevant if you are using SIMATIC Logon for central user administration.
User rights for installation	Administrator rights	WebUX server	Required rights for installing the WebUX server.
User rights for operation	Default user rights	WebUX client WebUX server	Required rights on the WebUX server and WebUX client.
Microsoft Internet Information Service (IIS)	WWW Services > Common HTTP Features or Shared HTTP Features: <ul style="list-style-type: none"> • Standard document • Static content WWW Services > Performance Features: <ul style="list-style-type: none"> • Compression of dynamic content • Compression of static content WWW Services > Application Development Features: <ul style="list-style-type: none"> • ASP.NET ≥ 4.5 	WebUX server	During the WinCC installation, the Microsoft Internet Information Service (IIS) is installed and configured.

WebUX client (terminal)

You only need an HTML5-capable Web browser such as Chrome, Firefox or Safari on a terminal that accesses the WebUX server.

Note

Browser-dependent representation

Differences in display and behavior are possible in the different browser versions.

To display a configured character set, for example, this must also be available in the browser or on the device.

Installation of the WebUX server

You can install WinCC/WebUX during the installation of WinCC.

When you install the server WebUX at a later time, proceed as follows:

1. Start the WinCC installation DVD.
2. Select the installation type "Custom Installation".

1.9 WinCC/WebUX

3. In the "WinCC" group of the "Program" dialog, select the entry "WinCC WebUX".
4. Transfer the WebUX license. You can find more information under:
 - WebUX licensing (Page 140)

You can find information about configuring WebUX under:

- Configuring the WebUX website (Page 144)

Limiting the number of connections

The number of the connections between WebUX server and WebUX clients was limited to a standard limit value of 150.

If the number of WebUX client connections reaches this limit value, further connections are rejected by the WebUX server. This supports the defense against DoS attacks.

You can modify the connection limit value in the `config.js` file.

Configuring the limit value

1. Log into the WebUX server with administrator rights.
2. Navigate to the folder:
 - `C:\inetpub\wwwroot\Siemens\WebRH\conf\`This contains the file `config.js`.
3. Open the file `config.js` with a text editor.
4. Search the text line `"config.sessionLimit = 150;"`.
The default limit value is 150.
5. Change the value `"config.sessionLimit"` and save the file.
6. Open the Internet Information Services (IIS) Manager and restart the WebUX website.

See also

WebUX licensing (Page 140)

Configuring the WebUX website (Page 144)

1.9.3 Configuring the WebUX website

Configure the WebUX website on the WebUX server and the connection via HTTPS to communicate with the WebUX clients.

WinCC WebUX Configurator

After WinCC and WinCC/WebUX are installed, the WinCC WebUX Configurator opens.

To make changes later, you can find the WinCC WebUX Configurator in the "Siemens Automation" program group.

You use the WebUX Configurator to set up the standard configuration for the use of WebUX.

- Configuration of the Microsoft Internet Information Service
- Settings of the Web server
- SSL certificate for HTTPS connections
- Virtual folder

You can find more information in the documentation for WinCC/WebUX:

- WinCC Web Configurator
- Creating a new default web page
- Creating a virtual folder

See also

Installation of WebUX (Page 142)

1.9.4 Communication: SSL certificate for HTTPS connections

To improve the security of your communication, WebUX only supports HTTPS connections.

You need a digital SSL certificate for the WebUX server.

NOTICE
<p>Protecting the infrastructure</p> <p>Setting up a Web server may enable access to your plant infrastructure.</p> <p>Therefore, protect the computer on which the Web server is installed. Make sure that the following rules are followed:</p> <ul style="list-style-type: none">• The computer is only accessible via secure connections.• The check mechanisms provided by software vendors are activated and cannot be bypassed under any circumstances.

Install a SSL certificate

You have the following options when setting up the WebUX website:

- Select an existing certificate
- Create self-signed certificate
- Install a certificate after setting it up

Creating a new certificate

1. Activate the "Create a new certificate" option.
2. Enter a name of your choice.

When the configuration is completed, a self-signed certificate is created. The certificate is valid for 1 year.

Additional information

You can find information on self-signed certificates when using different web browsers on the Internet under Entry ID 109773769:

- SiePortal: "How do you fix problems when using self-signed certificates from WebUX or WebNavigator with different web browsers?" (<https://support.industry.siemens.com/cs/ww/en/view/109773769>)

Note

Restricted authentication

The certificates that you create when you configure the WebUX website itself are not verified by an official certification body. Depending on your browser settings, a warning message is displayed when you access the website.

To better secure the server authentication, install the certificate of an official certification body.

Display of secure data sources only

For display of web pages and external files, one of the following conditions must be met:

- Call via the HTTPS connection
 - Call of a trusted site
-

Enabling SSL in IIS

To use SSL, configure SSL access in the Internet Information Service (IIS).

Requirement

- You have administrator rights on the WebUX server.

Procedure

1. Open the "Internet Information Services (IIS) Manager".
2. Select the web page under "Sites" in the "Connections" navigation area.
3. Click "Bindings" in the "Actions" area.
The "Site bindings" dialog opens.
4. To configure the settings, click "Add".
The "Add site bindings" dialog opens.
5. Select the website type, IP address and the port.
To display the fields for configuration of the SSL certificate, select the type "https".
6. Select the SSL certificate from the list or with "Select".
7. Confirm with "OK" to close the dialog.
You can delete the other entries in the "Site bindings" dialog.
8. Exit the configuration with "Close".

9. In the data area "Default Web Site Home", select the "SSL settings" under "IIS".
10. Activate the "Require SSL" option and select the setting for client certificates.

See also

SiePortal: "How do you fix problems when using self-signed certificates from WebUX or WebNavigator with different web browsers?" (<https://support.industry.siemens.com/cs/ww/en/view/109773769>)


1.10 Service and Support


1.10.1 Warnings


Security information

Warning notice system

This manual contains notices you must observe to ensure your personal safety and to prevent damage to property. 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. The warning notices shown below are graded according to the degree of danger.

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

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

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

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

Note

indicates important information about the product and its use or a specific section of the documentation to which you should pay particular attention.


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

Qualified personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety information. 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

Note the following:

 WARNING
Intended use of Siemens products
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.

Trademarks

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

Cybersecurity information

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

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

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit:

- <https://www.siemens.com/cybersecurity-industry> (<https://www.siemens.com/cybersecurity-industry>)

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

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

- <https://www.siemens.com/cert> (<https://www.siemens.com/cert>)

Disclaimer of liability

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

Information in the online documentation is more binding than that in the manuals and PDF files.

Observe the Release Notes and Installation Notes. Information in the Release Notes and Installation Notes is more binding than that in the manuals and online help.

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See also

<https://www.siemens.com/cybersecurity-industry> (<https://www.siemens.com/cybersecurity-industry>)

<https://www.siemens.com/cert> (<https://www.siemens.com/cert>)

1.10.2 GDPR - General Data Protection Regulations

Siemens takes data privacy principles, such as the privacy by design and default principle, into account when developing its products and services.

For the SIMATIC WinCC V8.1 product, including options, this means the following:

Personal data processed by the application

This product collects and processes the following personal data:

- User names, i.e. credentials, which may directly contain or establish a reference to family names and/or first names
- Timestamps: date / time of login, logoff and access
In the WinCC "Option for Process Control" application "Split Screen Manager", the login timestamp and user name are saved without encryption with the picture management data. In the WinCC/WebNavigator diagnostic page, logged in users and timestamps are saved without encryption.
- Location data (time zone)
- Computer name
- IP addresses
- MAC addresses
- Email addresses (WinCC Options)
- In case of using UMC, additional personal data can be added in the tool, e. g. telephone numbers or addresses.
This data is not needed for the product functionality and should not be stored on the same medium.

If the user links the above mentioned data with other data, e. g. shift plans, or stores personal data on the same medium, e. g. hard disk, and thus establishes a personal reference, the user must ensure compliance with data protection regulations.

Purposes

The above data is required for the following purposes:

- Access protection and security measures (e. g. Login, IP address)
- Process synchronization and integrity (e. g. time zone information, IP addresses)
- Archiving system for traceability and verification of processes (e. g. access timestamps)
- Message system for traceability and availability (e. g. email notification)

The storage of data is appropriate and limited to what is necessary, as it is essential to identify the authorized operators and process events.

Data configuration

The customer may configure the data collected via the product as follows:

- Display data in process pictures
- Data output in form of reports, e. g. for printing or display as electronic file
- Data collection and evaluation in form of graphics, e. g. for KPI analysis

Deletion policy

The product does not provide an automatic deletion of the above data.

1.10 Service and Support

If necessary, these can be deleted manually if desired. To do this, please refer to the product documentation or contact customer support.

Securing of data

The above data will not be stored anonymously or pseudonymized, because the purpose of access and event identification cannot be achieved otherwise.

The above data is secured by adequate technical measures, such as:

- Encryption of log data
- Storing the process data in access-protected SQL databases
The user must ensure the access protection as part of their process configuration.

1.10.3 Customer support

Customer Support, Technical Support

You can access the SIMATIC hotlines via the support request form on the Internet.

The SIMATIC hotline employees speak German and English. The Authorization hotline offers French, Italian or Spanish customer support in addition to German and English.

Technical support

Technical support is available around the clock from Monday to Friday.

The latest Technical Support information can be found at the following URL:

- <https://support.industry.siemens.com/cs/ww/en/sc/4868> (<https://support.industry.siemens.com/cs/ww/en/sc/4868>)

Form for support requests:

- <https://www.siemens.com/supportrequest> (<https://www.siemens.com/supportrequest>)

Siemens Industry Service Card

The "Siemens Industry Service Card" enables an additional Technical Support, such as fast response via "Priority Call-Back". You can find more information at the following URL:

- <https://support.industry.siemens.com/cs/ww/en/sc/4869> (<https://support.industry.siemens.com/cs/ww/en/sc/4869>)

SiePortal: The SIMATIC Online Support

Service and Support

You can find the SiePortal and an overview of the support offer under this URL:

- <https://sieportal.siemens.com/> (<https://sieportal.siemens.com/>)
- <https://support.industry.siemens.com/> (<https://support.industry.siemens.com/cs/ww/en/>)
- <https://support.industry.siemens.com/cs/ww/en/view/93906404> (<https://support.industry.siemens.com/cs/ww/en/view/93906404>)

In Product Support, for example, you will find downloads of firmware updates, service packs and useful applications.

The app is available for mobile Siemens Support:

- <https://support.industry.siemens.com/cs/sc/2067> (<https://support.industry.siemens.com/cs/ww/en/sc/2067>)

Videos and help pages are available so that you can successfully use the Support offer:

- <https://support.industry.siemens.com/cs/ww/en/sc/4866> (<https://support.industry.siemens.com/cs/ww/en/sc/4866>)
- <https://support.industry.siemens.com/cs/ww/en/sc/2063> (<https://support.industry.siemens.com/cs/ww/en/sc/2063>)

WinCC FAQs

WinCC Online Support with information on FAQs (Frequently Asked Questions) may also be found at the following URL:

- <https://support.industry.siemens.com/cs/ww/en/ps/14866/faq> (<https://support.industry.siemens.com/cs/ww/en/ps/14866/faq>)

Technical Forum

The Technical Forum supports exchange with other SIMATIC users. You can find the forum at the following URL:

- <https://support.industry.siemens.com/tf/> (<https://support.industry.siemens.com/tf/ww/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.com/simatic-tech-doku-portal> (<http://www.siemens.com/simatic-tech-doku-portal>)

Local partners database

To contact your local partner, search the local partners database at the following URL:

- http://w3.siemens.com/aspa_app/ (http://w3.siemens.com/aspa_app/?lang=en)

Product Information

SIMATIC WinCC

Go to the following URL for general information about WinCC:

- WinCC Landing Page:
<https://support.industry.siemens.com/cs/ww/en/view/93906404> (<https://support.industry.siemens.com/cs/ww/en/view/93906404>)
- SIMATIC HMI software product overview:
<http://www.siemens.com/wincc> (<http://www.siemens.com/wincc>)

SIMATIC Products

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

- <http://www.siemens.com/simatic> (<http://www.siemens.com/simatic>)

See also

SiePortal - Home (<https://sieportal.siemens.com/>)

SiePortal: Support request (<https://www.siemens.com/supportrequest>)

SiePortal: Technical support (<https://support.industry.siemens.com/cs/ww/en/sc/4868>)

SiePortal: Siemens Industry Service Card (<https://support.industry.siemens.com/cs/ww/en/sc/4869>)

SiePortal: SIMATIC WinCC in Online Support / Landing Page (<https://support.industry.siemens.com/cs/ww/en/view/93906404>)

SiePortal: Service and Support (<https://support.industry.siemens.com/cs/ww/en/>)

SiePortal: Information and help for support (<https://support.industry.siemens.com/cs/ww/en/sc/4866>)

SiePortal: Support - How-to Videos (<https://support.industry.siemens.com/cs/ww/en/sc/2063>)

SiePortal: Mobile use via support app (<https://support.industry.siemens.com/cs/ww/en/sc/2067>)

SiePortal: WinCC FAQs (<https://support.industry.siemens.com/cs/ww/en/ps/14866/faq>)

SiePortal: Support Technical Forum (<https://support.industry.siemens.com/tf/ww/en/>)

SiePortal: Technical documentation for SIMATIC products (<http://www.siemens.com/simatic-tech-doku-portal>)

Internet: Contact person database (http://w3.siemens.com/aspa_app/?lang=en)

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

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

1.10.4 Support request

Dear customer

In order to provide you with fast and effective support, please complete the "Support Request" form 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 support request, check whether your configured quantity structure is within the range of tested quantity structures (see "Performance Data" section).

Support Request form

The Support Request form is available at the following URL:

- SiePortal: Support request (<https://www.siemens.com/supportrequest>)

When filling out the report, you will be guided through several steps.

The data required by the Technical Support are described in the FAQ 16607894:

- <https://support.industry.siemens.com/cs/ww/en/view/16607894> (<https://support.industry.siemens.com/cs/ww/en/view/16607894>)

You can find more information on technical support at the following URL:

- <https://support.industry.siemens.com/cs/ww/en/sc/2100> (<https://support.industry.siemens.com/cs/ww/en/sc/2100>)

Procedure

1. Open the "Support Request" form via the link and click "New request"
Step 1 "Product search" is displayed.
2. Enter the order number or the product name in the field. 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 V7"
 - "wincc editor"
 - "WinCC DataMonitor"
 - "wincc webnav"
 - "Connectivity"The found products are offered in the "Product selection" field.
If you have any questions about licensing, activate the option "Licensing/Authorization".
3. Select the desired product and click "Next".
Step 2 "Problem description" is displayed.
4. Fill in the form.
Depending on the selection, suggested solutions and FAQs that were found for the selected keywords are listed.
If you have found a suggested solution for your problem, close the form in the browser.

1.10 Service and Support

5. Describe your problem as exactly as possible in the "Details" field. Please also check your WinCC installation and the configuration.
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.
Pay particular attention to the following questions and comments:
 - Was the configuration data created with older WinCC versions?
 - How can the error be reproduced?
 - Are other programs running simultaneously with WinCC?
 - Have you activated screen savers, virus scanners, power management?
 - Search your computer for log files (WinCC\Diagnose*.log, drwatson.log, drwtsn32.log). The log files are needed for error analysis. Therefore, be sure to send the log files as well.
 - To assemble diagnostic and system information from computers and other devices, use the "SIMATIC Assessment Suite - Data Collector" (SAS-DC) diagnostics tool.
More information is available in the Support entry 65976201 (<https://support.industry.siemens.com/cs/ww/en/view/65976201>).
6. To load your project directory and the log files into the Support Request, drag and drop the files into the gray field.
To do this, compress the data, for example, as a zip file.
7. When you have entered all the information, click "Next"
Step 3 "Check and submit" is displayed.
8. Enter your contact details and review the summary.
9. You close the support request by clicking the "Send" button.
Your data will be transmitted to Customer Support and processed there.
You will receive an order confirmation by email.
Step 4 "Confirmation" is displayed.
10. To print out your data, click "Request - Show/print details".

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

Your WinCC Team

See also

Performance Data (Page 261)

SiePortal: Support request (<https://www.siemens.com/supportrequest>)

SiePortal: Specifications for the Technical Support (<https://support.industry.siemens.com/cs/ww/en/view/16607894>)

SiePortal: Support - service catalog (<https://support.industry.siemens.com/cs/ww/en/sc/2100>)

SiePortal: SIMATIC Assessment Suite - Data Collector (SAS-DC) (<https://support.industry.siemens.com/cs/ww/en/view/65976201>)

What is new in WinCC V8.1?

2.1 What is new in WinCC V8?

Introduction

The following sections inform you in brief about the most important improvements in WinCC V8.1 compared with WinCC V8.0.

You can find detailed descriptions of the individual functions in the WinCC Information System.

2.2 Supported operating systems

Microsoft SQL Server 2022

As of V8.1 WinCC requires the Microsoft SQL Server 2022 (64-bit).

The SQL server is included in the scope of delivery of the product.

More information

- "WinCC Installation notes > WinCC Installation requirements > Microsoft SQL Server for WinCC (Page 25)"

Supported operating systems

WinCC as of V8.1 runs on the following operating systems:

- WinCC client projects
 - Microsoft Windows 10 ¹⁾ (Pro / Enterprise, 64-bit)
 - Microsoft Windows 10 ¹⁾ (Enterprise LTSC, 64-bit)
 - Microsoft Windows 11 ¹⁾ (Pro / Enterprise, 64-bit)
- For WebNavigator clients and DataMonitor clients
 - Microsoft Windows 10 ¹⁾ (Pro / Enterprise, 64-bit)
 - Microsoft Windows 10 ¹⁾ (Enterprise LTSC, 64-bit)
 - Microsoft Windows 11 ¹⁾ (Pro / Enterprise, 64-bit)
- For WinCC single-user projects and client projects
 - Microsoft Windows 10 ¹⁾ (Pro / Enterprise, 64-bit)
 - Microsoft Windows 10 ¹⁾ (Enterprise LTSC, 64-bit)
 - Microsoft Windows 11 ¹⁾ (Pro / Enterprise, 64-bit)
 - Microsoft Windows Server 2019 (Standard / Datacenter 64-bit)
 - Microsoft Windows Server 2022 (Standard / Datacenter 64-bit)
- For WinCC servers
 - Microsoft Windows 10 ^{1) 2)} (Pro / Enterprise, 64-bit)
 - Microsoft Windows 10 ^{1) 2)} (Enterprise LTSC, 64-bit)
 - Microsoft Windows Server 2019 (Standard / Datacenter 64-bit)
 - Microsoft Windows Server 2022 (Standard / Datacenter 64-bit)

1) The currently released build versions of Microsoft Windows 10 and Microsoft Windows 11 are listed in the Compatibility Tool.

2) WinCC server with up to three WinCC clients

More information

- "WinCC Installation Notes > WinCC Installation Requirements > Software requirements for installing WinCC (Page 21)"

2.3 Licensing

New licenses: "Unlimited"

As of WinCC V8.1, there are additional licenses available for an unlimited number of tags or clients:

License	Description ¹⁾
RT (Unlimited)	You can use any number of tags in runtime.
RC (Unlimited)	During the configuration and in Runtime you can use any number of tags.
WinCC WebUX Monitor (Unlimited)	You can connect any number of WebUX clients.
WinCC Web Client Operate (Unlimited)	You can connect any number of web clients.

1) The maximum number of tags and clients depends on the system limits and the configuration of your system.

More information

- "Licensing > Basic license types and license types in WinCC (Page 249)"
- SiePortal - Product catalog: SIMATIC WinCC V7/V8 (<https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10042373?tree=CatalogTree&SiepCountryCode=WW>)

Upgrade licenses

The following upgrade levels are available for upgrading to WinCC V8.1:

- Upgrade of WinCC V8.0
- Upgrade of WinCC V7.5 (SP1/SP2)
- Upgrade of WinCC V7.4 SP1

More information

- "Licensing > Overview of the licensing (Page 244)"

2.4 Function extensions in case of safe operation of the plant

WinCC V8 relies on the "Security by default" strategy to support you in configuring your plants and systems.

WinCC V8.1 contains further improvements that can protect your configuration and your runtime systems from unauthorized access.

WinCC Certificate Manager

The functions of the "WinCC Certificate Manager" application have been extended.

Amongst other you find comprehensive information in the online help on updating as well as the import and export of certificates.

Certificates for communication with S7 PLCs

The "WinCC Certificate Manager" supports "Secure Communication" for the communication with a PLC.

SIMATIC WinCC Unified Runtime certificates

The "WinCC Certificate Manager" application supports the import and management of certificates from SIMATIC WinCC Unified Runtime.

More information

- "Configurations > Certificates in WinCC":
 - "Introduction to certificates in WinCC"
 - "Certificates for communication with S7 PLCs"

Security Guideline - SIMATIC HMI WinCC V7/V8

WinCC V8 is oriented to the standard "IEC 62443-4-2:2019". The document "Security Guideline - SIMATIC HMI WinCC V7/V8" contains more information on this topic.

The document takes up the criteria of the IEC 62443-4-2 standard:

- The chapter "Mapping to IEC62443-4-2" contains the information on which WinCC functions correspond to the required criteria.
- The section "IEC 62443-4-2 Requirements" contains the detailed information as well as references to the WinCC documentation in the WinCC Information System and in SiePortal entries.

More information

- SiePortal: Security Guideline - SIMATIC HMI WinCC V7/V8 (<https://sieportal.siemens.com/en-ww/search?scope=knowledgebase&Type=siePortal&SearchTerm=%22security%20guideline%22&SortingOption=DefaultRankingDesc&EntryTypes=Manual&Page=0&PageSize=20&ProductNodePath=%2F13613%2F14729%2F14855%2F14866%2F>)

Password management and login

In the user management additional functions support you in the password management and login to protect against unauthorized access.

Password validity

In the properties of the User Administrator you can specify for how long a password is valid. You can specify after how many days a password expires and must be changed.

This setting is configured centrally for all users.

Failed login attempts

In the User Administrator properties you can specify the number of incorrect password entries after which a user is temporarily locked.

This setting is configured centrally for all users.

The locked users are unlocked automatically when Runtime is deactivated.

You have the following options for unlocking a user while Runtime is activated:

- "User Administrator" editor: Change password
- WinCC UserAdminControl (Runtime): Unlock user

Logon via RFID reader

WinCC supports logon via Radio Frequency Identification (RFID) and a SIMATIC RFID system.

If you are using SIMATIC communications modules with the RFID technology, you can configure the logon via RFID card in the User Administrator.

More information

- "Working with WinCC > Setup of a user management":
 - "Managing users > Create user"
 - "Logon via RFID reader"

Integrity check of the installed WinCC files

With the integrity check tool "SieSoftIntCheck.exe", you can determine whether the files of your WinCC installation are unchanged and correspond to the delivery state.

In this case, for example, the hash value and the signature of the files are checked.

Open the tool in the Microsoft Windows window "Command prompt" (CMD).

The WinCC installation files are checked and the result is written into a log file.

More information

- "WinCC Installation notes > WinCC Installation requirements > Notes on data and system security (Page 27)"

Hard copy function in Runtime

If the shortcut keys are disabled via the option "Disable shortcut keys for operating system access", the hard copy function only prints to physically connected printers.

No printout is possible on printers with the "Print to file" function, e.g. save as PDF file. The hard copy function is not performed for these printers.

More information

- "Working with WinCC > Documentation of Configuration and Runtime Data > Print Jobs in WinCC > Defining a Printer"
- "WinCC/WebNavigator - Documentation > Operating the WinCC project > Using the "Hard copy" function"

2.5 Functional extensions for diagnostics and analysis

Diagnostic functions in WinCC V8

You can find an overview of the diagnostic functions in the WinCC Information System:

- "Diagnostics > Overview: Diagnostics in WinCC"

System tag "@ConnectedRTClients"

The system tag "@ConnectedRTClients" specifies the number of active client connections to a local server or RT server.

More information

- "Configurations > Multi-User Systems > Quantity structures and performance"

System tags from VBScript

You use system tags in scripts to obtain information about the execution of your VB scripts or ANSI-C scripts.

If you configure scripts with VBScript, performance tags called "@VBSCRIPT_..." are created.

More information

- "Working with WinCC":
 - "VBS for creating procedures and actions > Diagnostics > System tags from VBScript"
 - "ANSI-C for creating functions and actions > ANSI-C function descriptions > Internal functions > WinCC > FillDiagnoseInTags"

Quality codes in OPC UA

The online help for OPC UA has been extended with the documentation of the OPC UA quality codes.

The assignment of WinCC quality codes and OPC UA status codes is shown in a table.

More information

- "Communication > Communication diagnostics > Quality of tags > Tag Quality Codes"

OPC UA: Trace functions

To handle errors in OPC UA communication you can use the Trace functions for the OPC UA client and OPC UA server.

More information

- "Communication > Communication Diagnostics > Diagnostics Channel OPC UA":
 - "How to configure the Trace function for the OPC UA client"
 - "How to configure the Trace function for the OPC UA server"

ProDiag: New functions

Display of PLC code

ProDiag additionally supports functions for displaying PLC code:

- Display in STEP 7
With these functions you can switch from one picture in WinCC Runtime directly to the point of use of a process tag in the program code of STEP 7.
This allows rapid and simple diagnostics of errors.
- Display in the PLC code view
With this function you can display the current program status of PLC programs in a PLC code view.

Error handling

ProDiag supports you additionally with functions for error handling:

- IpszErrorTag
- Error text

More information

- "Diagnostics > ProDiag - Plant monitoring in WinCC"
 - "Functions for displaying PLC code (Page 340)"
 - "Error handling (Page 362)"

2.6 Extended functionality for communication and interfaces

Tag Management: Setting up multiple communication drivers

To improve performance when communicating with multiple PLCs, you can integrate each communication driver multiple times in a WinCC project as of WinCC V8.1.

With multiple integration, the name of the respective channel is clearly identified by a suffix.

More information

- "Working with tags > Configuration in Tag Management > Creating communication drivers and connections > How to add a new communication driver".

WinCC REST communication

WinCC REST Connector / WinCC IT Connector

The "WinCC REST Connector" has been renamed to "WinCC IT Connector".

The WinCC IT Connector supports you in configuring the connection via MQTT.

Support for multi-user systems

WinCC REST communication is available for multi-user systems.

Support for MQTT protocols

The WinCC IT Connector supports the MQTT protocol.

More information

- "Interfaces > WinCC REST communication > REST interface and MQTT protocol in WinCC"

REST Interface

Placeholders when configuring the REST server and MQTT broker

The use of placeholders is supported when configuring the endpoints of the REST server or topics of the MQTT broker:

- Identification of endpoints
- Values of queries
- Values of headers
- Identification of topics

The "Date/time" and "Counter" types are available for the placeholder for values of the JSON body.

Calling VBS function/VBS code

The body of the Rest server response can be used to call a VBS function or a VBS code.

Message system methods

As of WinCC V8.1, the REST interface supports the Tag Management and the archive system as well as the message system, including:

- Reading configuration data of messages, message classes, message types, message blocks, and message groups
- Reading configuration data of tag limits
- Reading Runtime messages from:
 - Message lists
 - Short-term archives
 - Long-term archives
 - Hit lists
 - List of messages to be hidden / hidden messages

Language settings

The WinCC REST interface supports the specification of language settings as part of the HTTP requirement for language-dependent texts, e.g. of the message system.

More information

- "Interfaces > WinCC REST communication":
 - "REST interface and MQTT protocol in WinCC"
 - "Message system methods"

WinCC/Cloud Connector

You can also connect an asset created and configured in MindConnect IOT Extension via MindConnect MQTT.

To this purpose, migrate the existing asset configuration from MindConnect IOT Extension to MindConnect MQTT.

More information

- "WinCC/Cloud Connector > How to migrate an asset from MindConnect IoT Extension (Mindsphere / Insights Hub) to MindConnect MQTT"

New communication channel: Alarm Channel

You configure the tags for the message system in the "Alarm channel" communication channel. You use the tags for the message-dependent dynamizations of objects in Graphics Designer.

The tag value contains the number of pending messages respectively which correspond to specific filter criteria.

As filter criteria you use the SQL statements for filtering messages in WinCC AlarmControl.

If you select several servers as the source, the number of filtered messages from the individual servers is added as a variable value.

More information

- "Communication > Alarm Channel"

Communication channel: SIMATIC S7-1200, S7-1500 Channel

Software Controller V30.0

The Software Controller V 30.0 is compatible with WinCC V8.

You can connect and use the Software Controller V 30.0 in WinCC without any restrictions.

- The configuration and the certificate can be exported from TIA Portal.
- The IP address is configured in the connection.
- The data of Software Controller V 30.0 is available in Runtime.

Communication with SINUMERIK ONE

The "OMS+" channel unit of the channel "SIMATIC S7-1200, S7-1500 channel" supports connection to S7-1500 PLCs in the communication channel SINUMERIK ONE.

Access to NCU Core is not supported.

Data types of the controller in a nested structure (UDT)

The use of data types of the controller in a nested structure (UDT in UDT) is supported.

Updating AS structures

If you change an AS structure that has already been imported in the automation system, update the AS structure in WinCC. To do this assign the changed tag type members to the respective structure type elements.

The online help has been extended by a description of this procedure.

More information

- "Communication > SIMATIC S7-1200, S7-1500 Channel"
- "Communication > SIMATIC S7-1200, S7-1500 Channel > Configuration of the channel > How to update the AS structures"

Communication channel: Allen Bradley - Ethernet IP

As of WinCC V8.1 the communication channel supports the channel unit "Allen Bradley E/IP GuardLogix":

Channel unit of the channel	Communication network	AS
Allen Bradley E/IP GuardLogix	Ethernet IP	GuardLogix 5580

More information

- "Communication > Allen Bradley - Ethernet IP"

Communication channel: OPC UA WinCC Channel

Filter rules for the "contains" operator

The online help has been extended with a list of the filter rules for the "contains" operator.

More information

- "Communication > OPC UA WinCC Channel > Configuring the OPC UA channel > Using OPC UA alarms in WinCC > Filter for OPC UA alarms"

WinCC OPC UA server

UaExpert: OPC UA client for test purposes

WinCC supports the free OPC UA client "UaExpert" for test purposes of Unified automation.

The OPC UA client "UaExpert" supports the following functionalities of OPC UA:

- Browse
- Read/Write
- Subscription
- Methods
- Historical Access
- Alarms and Conditions

UaExpert has the following plugins:

- OPC UA Data Access View
- OPC UA Alarms & Conditions View
- OPC UA Historical Trend View
- OPC UA Performance Plugin
- Image Viewer
- Server Diagnostics View
- Simple Datalogger CSV Plugin
- GDS Push-Model Plugin

Quality codes in OPC UA

The online help has been extended with assignment of the OPC UA quality codes to WinCC quality codes.

Support of nested structures

When searching the OPC UA server in Tag Management, nested structures can be assigned and instances can be created.

More information

- "Interfaces > OPC - Open Connectivity > WinCC OPC UA Server > UaExpert"
- "Communication > Communication diagnostics > Quality of tags > Tag Quality Codes"

Communication channel: SinumerikNC

NC alarms

The NC alarms are supported for the SINUMERIK 840D sl.

Configured NC alarms are displayed in Runtime in the WinCC AlarmControl.

SINUMERIK S7-300

As of WinCC V8.1 you configure the process communication to a PLC "SINUMERIK S7-300" via the channel "SinumerikNC" instead of via "SIMATIC S7 Protocol Suite".

After migrating to V8.1, you will find "SINUMERIK S7-300" type PLCs configured in older versions under the "SinumerikNC" communication channel.

You still configure the process communication to a S7-300 control without SINUMERIK in the communication channel "SIMATIC S7 Protocol Suite".

More information

- "Communication > SinumerikNC":
 - "Configuring the channel"
 - "Configuration of the channel > How to configure alarms on the SINUMERIK 840D sl"

Communication channel: WinCC Unified Channel

The new user group "RTIL Tracing User" has been created for the connection of the WinCC project with WinCC Unified.

More information

- "WinCC Installation Notes > WinCC installation requirements > Defining access rights in the operating system (Page 31)"

Channel units: Parameters

The online help has been extended by an overview of the functions, which are written to by property bits in the properties of the channel unit.

More information

- "Communication > Process communication > WinCC process communication > Principle of WinCC communication"

2.7 Enhanced functionality in Runtime

Maintenance stop

When you archive your Runtime data, all database segments are disconnected respectively when Runtime is deactivated.

No further values are saved. The segments have to be reconnected when reactivating.

Alternatively as of V8.1, WinCC offers the possibility to stop Runtime via a maintenance stop:

- Runtime is deactivated and the Runtime window is closed:
- The archive segments, with the exception of the current segment, are not disconnected.
- When you re-activate Runtime, archiving continues.

In the toolbar click this symbol to perform the maintenance stop:



More information

- "Working with WinCC"
 - "Working with projects > Activating projects > How to perform a maintenance stop"
 - "Archiving process values> Process value archiving in WinCC"

Logon via RFID reader

WinCC supports logon via Radio Frequency Identification (RFID) and a SIMATIC RFID system.

If you are using SIMATIC communications modules with the RFID technology, you can configure the logon via RFID card in the User Administrator.

Supported RFID readers

WinCC supports the following SIMATIC RFID readers for the USB interface:

- SIMATIC RF1040R
- SIMATIC RF1060R
- SIMATIC RF1070R

More information

- "Working with WinCC > Setup of a user management > Login via RFID reader"

See also

Other Innovations (Page 186)

2.8 Extended functionality for graphic objects and libraries in WinCC Graphics Designer

Simplified color configuration

New functions for the color configuration help you to optimize the color design of your WinCC projects.

New predefined designs:

- WinCC Neo Bright
- WinCC Neo Dark
- WinCC Neo Lava
- WinCC Neo Ocean

Central color palette:

- Continuous view of the defined colors in one single list.
To add colors, drag the selected color from the color field to the desired line in the color list.
- Filtering the color palette according to color names
Enter a part of the searched color name in the input field via the list.
Only those colors are displayed which contain the entered character string in the name.
- User-defined color areas
Under the list of the colors you find the symbols for creating, renaming and deleting own color areas.
The color areas are shown in the drop-down list via the color list and help you to quickly jump to the color area in the list.
- Referencing of colors via color index
If you create a new color, you can reference an existing color index as the color value.
To do this, double-click in the field and enter the color index.
If you change the color value of the referenced color, the points of use also adopt the new color value.

WinCC controls: Variants

As of WinCC V8.1 you can also use WinCC controls with a self-defined color palette as templates.

In the selection window "Controls", one version "With Palette Colors" each is displayed under the control. Click "+" in front of the control name.

When you insert these templates, the associated grid and color settings, for example, are applied.

You change the color palette for these controls via "Extras > Active color palette":

- From the drop-down list select the desired color areas "WinCC Controls" or "WinCC Trends" and modify the colors according to your requirements.
- When inserting the control version "With Palette Colors" this changed color palette is used as the template.

This function is not available for the following WinCC controls:

- WinCC Media Control
- WinCC WebBrowser Control
- Prodiag: WinCC GraphOverviewControl
- Prodiag: WinCC ProdiagOverviewControl
- .NET controls
- WPF controls
- Web controls

More information

- "Working with WinCC > Creating process pictures"
 - "Working with controls > How to insert a control from the selection window"
 - "Elements and basic settings of the Graphics Designer > The central color palette"

Dynamic SVG graphics

You have the following options for dynamizing SVGHMI objects:

- Via a script
- Via the properties encoded in the SVG

SVG graphics that can be dynamized via properties are provided in the SVG library of the Graphics Designer.

With dynamization of the object properties, you have the following options:

- Time-based animation that is not synchronized by a process tag
- Change colors and color gradients
- Change the position of the object or individual points of a path through movement
- Rotation and scaling of an object or individual parts of an object
- Show and hide
- Dynamize text

More information

- "Working with WinCC > Creating process pictures > Working with the libraries"

WinCC 3D Control

As of WinCC V8.0, WinCC also offers a 3D control that can be configured and dynamized in a variety of ways.

The functions of this control have been extended significantly.

2.8 Extended functionality for graphic objects and libraries in WinCC Graphics Designer

The new functions include:

- Camera methods
- Step methods
- Animation methods

More information

- "Working with WinCC > Creating process pictures > Working with controls > WinCC 3D Control"

Custom Web Controls

As of WinCC V8.0, WinCC supports the "Custom Web Controls".

These controls represent an autonomous web site with an interface to Runtime. Custom web controls make it possible to supplement the provided visualization elements with custom elements. In this way, custom web controls improve usability and functionality to achieve optimal visualization results.

You can use custom web controls in WinCC Runtime, WinCC/WebNavigator, and WinCC/ WebUX.

Optimized rendering mode

For optimal display in Runtime the custom web controls as of WinCC V8.1 support different types of the rendering:

- Layer support ("windowless")
- In the foreground ("Windowed")

More information

- "Working with WinCC > Creating process pictures > Working with controls > Custom Web Controls"

Faceplate types: Closing popup screens via scripts

You can use the following methods to close popup screens via a script:

VBS	ClosePopup	ClosePopup ("PopupWindow")
ANSI-C	ClosePopup	BOOL ClosePopup(LPCTSTR lpszPictureWindowName);

To close all open popup screens, enter the placeholder "*" as the name.

More information

- "Working with WinCC > Creating process pictures > Working with faceplate types > Configuring a faceplate type > Popup screen of a faceplate type"

WinCC controls

Object property "ConsiderTagPrefix"

This new object property "ConsiderTagPrefix" specifies whether the tag prefix of the picture window is to be taken into account.

The dynamizable attribute is available for the following controls:

- WinCC OnlineTrendControl
- WinCC OnlineTableContol
- WinCC FunctionTrendControl
- WinCC BarChartControl

Display of the value axis

These object properties are available for formatting the value axes in WinCC Controls:

Attribute	Description
ValueAxisCoarseGridValue XAxisCoarseGridValue YAxisCoarseGridValue	Spacing between long graduations of the value axis
ValueAxisFineGridValue XAxisFineGridValue YAxisFineGridValue	Spacing between short graduations of the value axis
ValueAxisAutomaticGridSpacing XAxisAutomaticGridSpacing YAxisAutomaticGridSpacing	Defines how the graduations of the value axis are displayed. <ul style="list-style-type: none"> • TRUE: The spacing of the graduations is set automatically. • FALSE: The values of the "GridValue" object properties are used to format the graduations. The data type is BOOL.

You can use the new properties in the following WinCC Controls:

- WinCC BarChartControl
- WinCC OnlineTrendControl
- WinCC FunctionTrendControl

Other graphic objects

Selecting pictures for objects

Additional formats are supported at the selection of pictures for WinCC objects:

Object	Additional formats
Graphic object	SVG
Status display	ICO, CUR, GIF, JPG, SVG
Button	SVG
Round Button	SVG
SVG object	SVGHMI

More information

- "Working with WinCC > Creating process pictures > Working with objects > Quick configuration of objects > How to select pictures"

2.9 Extended functionality in Tag Management and Tag Logging

WinCC TAG Simulator: Recording a simulation

The "Tags simulation" editor offers the possibility to let a simulation run and record it in the process.

The "Record and play" function offers the option of recording and playing back user-defined tag changes with quality and time stamp.

This allows you to repeat specific use cases exactly.

More information

- "Working with WinCC > Working with Tags > Simulating tags with the WinCC TAG simulator > Recording and reproducing tags"

Load AS symbols: Load wizard

You can use the load wizard to load AS symbols from TIA Portal export files.

- With the load wizard, you apply import and filter rules to automatically import tags and structures.
When importing via the load wizard specify the TIA export file and an XML file as the filter file with the import rules.
- In the process you can have subsequent steps configured which previously were edited manually, such as assigning logging tags or creating messages.

The load wizard reduces post-processing work after the import and is therefore particularly suitable for larger amounts of data.

More information

- "Communication > SIMATIC S7-1200, S7-1500 Channel > Configuring the channel > How to download AS symbols offline"

2.10 Extended functionality in the message system

Alarm Channel: Tags for alarm-dependent visualization

You configure the tags for the message system in the "Alarm Channel" communication channel. The tag value contains the number of pending messages respectively which correspond to specific filter criteria.

You use the tags for the message-dependent dynamizations of objects in Graphics Designer.

More information

- "Communication > Alarm Channel"

Displaying the user name in the WinCC AlarmControl

In WinCC AlarmControl, you can display the name of the executing WinCC user for the following actions:


- Lock/unlock message
- Hide/unhide message
- Acknowledge message
The message acknowledgment can be logged with information on the acknowledging user and computer used.

Display of the user name when acknowledging PLC alarms

If the user acknowledges a PLC alarm and the PLC responds to this request, "System" is displayed as the acknowledging user.

If the response of the PLC to the acknowledgment request is delayed, the user name of the requesting user is displayed during this time.

Displayed status:

- Acknowledgment requested for a PLC alarm: 

More information

- "Working with WinCC > Setting up a message system":
 - "Configuring the message system"
 - "Configuring the message system > Working with message blocks > Description of the system blocks"
 - "Display of messages in Runtime"

Connecting WinCC script with a message

The online help has been extended and describes the configuration of message calls via a C script or VB script in Runtime.

To this purpose assign a function to the message and configure the function parameters.

The function is triggered in Runtime in the message window.

More information

- "Working with WinCC > Setting up a message system > Configuring the message system > Working with messages > How to connect a WinCC script with a message"

Migrated projects: Updating system messages

If you open a WinCC project that was created with a previous version, the system messages are automatically updated during the implicit migration.

The new system messages are also applied at the same time.

You no longer have to perform the update yourself after the migration.

More information

- "First steps > Migration (Page 203)"

2.11 Extended functionality with options for Process Control

Lifebeat Monitoring

In the device list, you specify the connection via which the lifebeat objects are monitored.

In the case of WinCC stations you configure a direct connection from WinCC to the monitored WinCC station using the computer name in WinCC V8.1.

This means the WinCC station is monitored via internal WinCC mechanisms. The OPC DA channel is no longer required.

More information

- "Options > Options for process control > Lifebeat monitoring":
 - "The lifebeat monitoring device list"
 - "How to configure lifebeat monitoring"

Multi VGA: Advanced screen format

For multi-VGA, for example, the layout in screen format "2560*1600" supports up to four monitors.

Higher resolutions are supported to a limited extent:

You can use two ultra-wide monitors as individually configured monitors with the following resolutions:

- 3840*1080
- 5120*1400

More information

- "Options > Options for process control > OS Project Editor > The "Layout" tab > Layout tab"

Process pictures: "Web-enabled" option selected

When running through the OS project editor, the "Web-enabled" option is immediately set for the Basic Process Control system pictures.

You can use the system pictures for WebUX and WebNavigator without any further adaptation.

OS Project Editor

Palette colors

WinCC V8.1 provides additional possibilities to configure the colors.

The "BPC – General" project palette contains colors for color index 900 to 919.

You can use these colors to modify the colors in the basic data pictures.

More information

- "Options > Options for process control > OS Project Editor > The "Basic data" tab"

New process control message

A system message has been added in WinCC V8.1:

System message	Use
1013012	Electronic signature: Operator text

More information

- "Options > Options for Process Control > OS Project Editor > Overview of the Process Control Messages"

2.12 Extended functionality for WinCC/WebNavigator / WinCC/DataMonitor

"WebNavigator Runtime" application can be disabled

Similar to other WinCC Runtime components, you can now also enable and disable WebNavigator Runtime via the startup list.

If WinCC/WebNavigator or WinCC/DataMonitor are installed on the PC, the "WebNavigator Runtime" application is enabled in the computer properties of the web server.

To prevent the service from starting when WinCC Runtime is enabled and thus speed up the Runtime start for test purposes, for example, disable the "WebNavigator Runtime" application in the "Startup" tab.

Deep links to process pictures

WinCC enables access to process pictures via a deep link.

Copy the URL for this via the shortcut menu of the published process pictures in WinCC Explorer.

Requirements:

- You have created a default web site with the Web Configurator.
- The WinCC process pictures were published using the WinCC Web Publishing Wizard.

More information

- "WinCC/WebNavigator > WinCC/WebNavigator Documentation > Operating the WinCC project > General properties of the WebNavigator client"

2.13 Extended functionality for WinCC/WebUX

The user interface design of WinCC/WebUX V8.1 has been revised and modernized.

WebUX server: Maximum number of WebUX clients

You can also operate a WebUX server on a PC with the Microsoft Windows 10 or Microsoft Windows 11 operating system.

In WinCC V8.1, up to 9 WebUX clients can access this WebUX server.

More information

- "Options > WinCC/WebUX – Documentation > Installing WebUX"

"WebUX Runtime" application can be disabled

Similar to other WinCC Runtime components, you can now also enable and disable WebUX Runtime via the startup list.

If WinCC/WebUX is installed on the PC, the "WebUX Runtime" application is activated in the computer properties of the WebUX server.

To prevent the service from starting when WinCC Runtime is enabled and thus speed up the Runtime start for test purposes, for example, disable the "WebUX Runtime" application in the "Startup" tab.

More information

- "Options > WinCC/WebUX > Configuring a WinCC project for WebUX"

Basic Process Control

WebUX supports the "Basic Process Control" (BPC) WinCC option and the "Advanced Process Control" (APC) option as of WinCC V8.1.

You can use the functions which are also supported by WinCC/WebNavigator.

The constraints compared with WinCC Runtime are listed in the online help.

More information

- "Options > WinCC/WebUX – Documentation > Functions supported in WebUX"
- "Working with WinCC > Options > Basic Process Control"

WebUX client – Runtime

The behavior on the WebUX client has been improved in Runtime:

- WinCC controls:
 - Export of Runtime data is supported.
- The print function is supported for the following WinCC controls:
 - WinCC Alarm Web Control
 - WinCC OnlineTable Web Control
 - WinCC OnlineTrend Web Control
 - WinCC FunctionTrend Web Control
 - WinCC Ruler Web Control
- WinCC UserArchiveControl
 - The behavior and performance of the WinCC UserArchiveControl corresponds to the behavior in WinCC Runtime.
 - The control supports the print function.
- WinCC FunctionTrend Web Control
 - The display of user archive data in the control is supported.
- WinCC FunctionTrend Web Control / WinCC UserArchiveControl
 - Access to user archive data via scripts is supported.

More information

- "Options > WinCC/WebUX – Documentation > Configuring a WinCC project for WebUX"

Graphics objects and dynamization

As of WinCC V8.1, further constraints no longer apply.

The following functions are now supported:

- Smart objects:
 - Group display
 - DataSet object

More information

- "Options > WinCC/WebUX – Documentation > Functions supported in WebUX"

Deep links to process pictures

On a WebUX client, you can call up process pictures directly via a deep link.

Requirement:

- The process picture is "web-enabled".

More information

- "Options > WinCC/WebUX – Documentation > How to use WebUX"

Trend selection in controls

WinCC OnlineTrend Web Control, WinCC FunctionTrend Web Control and WinCC OnlineTable Web Control now support trend selection.

2.14 Other Innovations

WinCC Explorer and WinCC editors in new design

The user interface design of WinCC V8.1 has been revised and modernized.

The color scheme and icons in WinCC Explorer and in the editors of WinCC Configuration Studio have been updated.

The new symbols and colors support the flexible display with different devices and background settings.

WinCC home page with additional functions

As of WinCC V8.1 the WinCC explorer starts with a Welcome screen, in which you call the most important functions:

- Create a new project
- Open / close a project
- Activate / deactivate a project
- Advanced search
- First steps
- Display the online help "WinCC Information System"
- Display the installed software
- License analysis
- Settings
- Close WinCC Explorer

If a WinCC project was opened when terminating WinCC, the WinCC Explorer opens with the editor view which you know from previous versions.

In the editor view of the WinCC explorer you switch to the new home page by using this symbol:



More information

- "Working with WinCC > Working with projects":
 - "Open a WinCC project"
 - "Creating and editing projects > How to create a project"
 - "Activating a project"
 - "Browsing a project"

Comprehensive search in the WinCC project

Extended search function

With WinCC V8.1 a comprehensive search function supports you in managing and working in your WinCC projects.

WinCC allows you to search for texts that are used in different objects in the WinCC project, for example in process pictures, tag names, or in the Online Help.

To call up the search editor in the navigation area of WinCC Explorer, click the search icon on the home page or in the menu bar:



To search for a specific text in the open project, enter a character string as a search expression in the search field:

- The search expression may consist of one word, multiple words, or parts of words.
- Boolean operators are supported.
- Spaces and underscores are considered as word boundaries.
- You can limit the search to specific areas and objects.
- No differentiation is made between upper and lowercase letters.

The search results are displayed as a list in the search editor:

- The objects that contain the text you searched for are listed along with the location where they were found.
- Double-click on a search result in the list to open the location or object in the respective editor.

Filter function in the data window of the WinCC Explorer

You can filter the displayed objects using the input field at the top of the data window.

For example, if your project contains many VBS scripts, you can easily search for specific actions or modules in the list.

Use the "*" wildcard to replace any character at the beginning, end, or in the middle of the filter text.

More information

- "Working with WinCC > Working with projects"
 - "Browsing a project"
 - "The WinCC Explorer > Windows of the WinCC Explorer"
 - "The WinCC Configuration Studio > Working in the data area > Searching / replacing in the data area"

New system messages

The following system messages have been added in WinCC V8.1:

System message	Use
1000212, 1000213	Connection status (enabled/disabled)
1008011, 1008012	Locking/unlocking users after failed login attempts
1008013	RFID card reader accessibility
1012622, 1012623, 1012624, 1012625, 1012626	SIMATIC Process Historian: Audit Trail status (enabled/disabled)
1900025, 1900026, 1900027, 1900028, 1900029	WinCC/Audit: Status of database segments (created/closed/saved)

More information

- "Working with WinCC > Setting up a Message System > Configuring the Message System > Working with System Messages > Description of WinCC System Messages"

Report Designer: Multi-page reports

WinCC V8.1 supports the configuration of multi-page reports which can contain several different reports, logs, or layouts.

In the Report Designer, you can use the "Embedded layout" dynamic object to insert layouts into other layouts and output them together.

More information

- "Working with WinCC > Documentation of configuration and Runtime data > How to configure multi-page reports".

WinCC Documentation

3.1 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
- Web-based Help via "My Documentation Manager"

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 190)

Direct Help ("What's This?") in WinCC (Page 191)

WinCC Information System (Page 193)

Navigation in the WinCC Information System (Page 196)

Search in WinCC Information System (Page 199)

Documentation in the Internet (Page 201)

3.2 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 189)

Direct Help ("What's This?") in WinCC (Page 191)

WinCC Information System (Page 193)

Navigation in the WinCC Information System (Page 196)

Search in WinCC Information System (Page 199)

3.3 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.

A tooltip window opens after you call the Direct Help. From this window, you may request additional help from the WinCC Information System via links.

Show complete text

A standard size for the tooltip window is defined for each component.

Long texts may not be shown in full in the open window.

To read the full text, click in the window. Drag the text with the mouse or move the text down or to the right using the arrow keys.



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 the <TAB> key.

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

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.

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

See also

WinCC Documentation (Page 189)

Tooltips and Status Bar (Page 190)

WinCC Information System (Page 193)

Navigation in the WinCC Information System (Page 196)

Search in WinCC Information System (Page 199)

3.4 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 WinCC "What's This?" help.

From Windows Explorer

In the "Siemens" program group, select the entry "Documentation" and then the folder "Manuals".

A folder that contains a link to the respective WinCC Information System exists for each installation language.

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.

External window

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 codes indicate the different types of information. Sections of the same information type have the same color code.

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

Color code
Basics and background information
Instructions
Examples

Dropdown texts

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

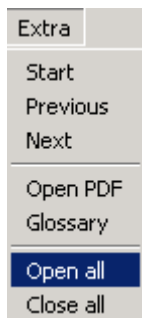
The additional information consists of text, tables, etc.

To hide the drop-down text, click it again.

The following notation is used in the online help:

Icon	Meaning
<u>Expandable text</u>	Heading with this form indicate expandable text in the online help.

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



Print versions of the WinCC Information System

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

1. On the Additional Content DVD, open the "Documents" path.
A folder has been created for each installation language.
2. Open the desired PDF file in the language folder.
The main sections of the WinCC Information System are summarized in PDF files with the title "WinCC_<Title>_<LanguageIdentification>.pdf."

PDF reader

To open the printable files, you 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>)

See also

Tooltips and Status Bar (Page 190)

WinCC Documentation (Page 189)

Direct Help ("What's This?") in WinCC (Page 191)

Navigation in the WinCC Information System (Page 196)

Search in WinCC Information System (Page 199)

Documentation in the Internet (Page 201)

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

3.5 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.

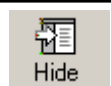
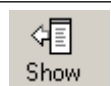
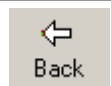

Navigation Area Tabs

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

Tab	Meaning
"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"	If this tab is displayed, you can store topics that you need frequently here. These topics 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:

Icon	Meaning
 Hide	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.
 Show	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.
 Back	Click this button to return to the previous page.
 Forward	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:

Icon	Meaning
	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.

Shortcut menu in the table of contents

You can open all the hierarchical levels in the table of contents at the click of a mouse via the shortcut menu with "Open all". Select "Close all" to close all the hierarchical levels again.

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.

Entry	Meaning
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.
History	Offers links to topics opened earlier. A maximum of ten topics are saved in the History.
Tools > Open	Opens all closed dropdown texts and dropdown images.
Tools > Close	Closes all open dropdown texts and dropdown images.
Tools > Start	Jumps back to the first page opened.
Tools > Previous / Next	Navigates back and forward between the topics opened earlier.

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 keys	Navigating in the table of contents.
<Enter key>	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 189)

Tooltips and Status Bar (Page 190)

Direct Help ("What's This?") in WinCC (Page 191)

WinCC Information System (Page 193)

Search in WinCC Information System (Page 199)

3.6 Search in WinCC Information System

Full text search on the "Search" tab

The "Search" tab offers various options for configuring your search for maximum effectiveness.

Alternative search options: Search editor on the WinCC home page

To search the WinCC project for texts in different objects, use the search editor on the WinCC Explorer home page.

Here you can search through process pictures, scripts, or the Online Help, for example.

More information: "Working with WinCC > Working with Projects > Searching a Project"

Advanced 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:

- With the search term "*messages", for example, the following words are found: "Messages", "System operator input messages", "Process control messages", "Process messages"

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"

Search for 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 part of another word, it is possible that the term is not marked. Use the keyboard shortcut <Ctrl+F> to activate the search within the page.

See also

WinCC Documentation (Page 189)

Tooltips and Status Bar (Page 190)

Direct Help ("What's This?") in WinCC (Page 191)

WinCC Information System (Page 193)

Navigation in the WinCC Information System (Page 196)

3.7 Documentation in the Internet

Overview

You can search for WinCC documentation in the Internet.

The search results will be displayed in "My Documentation Manager". There, you compile your own documents which you can then output in the formats PDF, RTF or XML.

Searching for WinCC Help topics in the Internet

1. Click [support.automation.siemens.com \(http://support.automation.siemens.com/WW/view/en/10805583/133000\)](http://support.automation.siemens.com/WW/view/en/10805583/133000) to search in the WinCC documentation.
2. Select "Manual" as the entry type in the filter settings.
3. If required, enter additional key words and click the magnifier icon.
4. Click one of the results, e.g. "WinCC V7.5: Working with WinCC".
The drop-down list on the right can be used to sort the results list.
5. Click on the link "Displaying and configuring" in the open page.
The page "My Documentation Manager" opens and the topics of the manual will be displayed. Alternatively, you can open and save the manual as a PDF file via "Download".

Direct call of "My Documentation Manager"

If you have already displayed or compiled documents in "My Documentation Manager", use My Documentation Manager (<https://support.industry.siemens.com/My/ww/en/documentation>) to directly open these compilations.

On the start page you will find a detailed description of the functions and operation of "My Documentation Manager".

Registration

If you want to use all the functions without any restrictions, you have to register for "My Documentation Manager".

The registration link can be found at the top right in "My Documentation Manager".

After registration, you can download the PDF version of the manual via "My Library".

Searching for Help topics in "My Documentation Manager"

In "My Documentation Manager" you can restrict the search within a manual to a specific topic type, such as action or example.

1. Go to the "Search" tab.
2. Enter a search term, for example, "WinCC message system".
3. Select the type of help page as the topic type, for example, "Action".
4. Click "Search".
The search results are displayed below.

3.7 Documentation in the Internet

5. Click on one of the search results.
The topic of the WinCC Information System is displayed on the right.
6. If you click on the "Last visited" tab, you will see the topic embedded in the structure of the manual.
7. You can also search for search terms using the index.
Right-click on one of the chapters of the manual.
The index of the document is displayed via the "Show index" menu.

Compiling Online Help documents for more processing

If you want to print parts of the Online Help or reuse them in other programs, you have to collect and generate the documents in a library.

You must have registered and be logged in.

You can read how to create a generated document, as a PDF, for example, in the description of "My Documentation Manager".

The generated document can then be saved in a freely selectable location.

Language support in "My Documentation Manager"

The majority of WinCC documents are available in all languages supported by WinCC.

To set the language for a document in "My Documentation Manager", right-click on the title of the document.

Select the required language.

See also

WinCC Information System (Page 193)

My Documentation Manager (<https://support.industry.siemens.com/My/ww/en/documentation>)

support.automation.siemens.com (<http://support.automation.siemens.com/WW/view/en/10805583/133000>)

Migration

4.1 Introduction

Introduction

This section contains information on the migration of WinCC projects created before WinCC V7.4 SP1.

Upgrading of versions > V7.4 SP1

No migration is required for projects created with WinCC as of V7.4 SP1. You only have to convert the project data.

To convert the project data select the menu command "Tools > Convert Project Data" in the WinCC Explorer.

After a conversion follow the instructions from the following section which apply for your WinCC project:

- "Additional steps during migration (Page 219)"

Upgrading of versions < V7.4 SP1

When you open a project of the predecessor version with the current WinCC version, you are prompted to migrate the project. Alternatively, migrate several WinCC projects in a single step with the WinCC Project Migrator.

We know from experience that some projects cannot be upgraded with version jumps.

Migrate from version to version: V6 > V7.0 > V7.2 > V7.4 SP1 > V7.5 > V8.1

More information on migration of WinCC versions V4 or higher is available under the following URL (entry ID=44029132):

- SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/de/en/view/44029132>)

Backing up a project

Prior to migration or conversion of the project data, it is recommended to make a backup copy of the original version of the project.

More information:

- "Working with WinCC > Working with Projects > Copying and duplicating a project"

Multi-user Projects

When you are working with a multi-user project that was created in the previous version, 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 can be found in the chapter "Upgrading a Redundant System in Normal Operation (Page 222)".

NOTICE
Migrating redundant systems without extended interruption
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.

Behavior during migration of ServiceMode projects

At the start of migration, the Migrator checks whether or not the project on hand is a ServiceMode project.

The following is also verified in the case of a ServiceMode project:

- If a service user has been entered
- If the service user is available
- If the service user is a member of the "SIMATIC HMI" group
- If the service user is able to log on

An error message is output and the migration process is aborted if one of these criteria is not met.

The central archive server WinCC/CAS is migrated to Process Historian

With WinCC V7.2 and later, the data of the WinCC/CAS is migrated to SIMATIC Process Historian.

Important information on migration can be found in the Process Historian documentation.

Migration of chip cards when using the "Chip card reader" option

With WinCC V7.3 and later, the user information on the chip card is saved with an improved hash function for passwords.

After upgrading, you must re-assign the passwords for all WinCC users in all projects, which means server projects and client projects.

This means that you have to write all chip cards in use once again with the corresponding users in the User Administrator.

Afterwards, only the new user information specified as of WinCC V7.3 exists in the projects and on the chip cards.

Converting project data

You may also import selected project data and files from projects created in a previous version for use in a new WinCC project.

To do this, you need to adapt pictures and script files, for example, to the current version of WinCC and convert them to the current format.

- It is not possible to convert an individual picture or library object.
- System pictures that you set as invisible in the computer properties are not converted. Check the "Use prefix" and "Prefix" settings under "Graphics" in the "Computer properties" area of the "Computer" editor.

NOTICE
Conversion is irrevocable
Conversion of data cannot be undone.
The conversion starts immediately, as soon as you confirmed the dialog with "OK".

Note

Duration of conversion

Conversion of pictures and libraries may take some time.

Basic Process Control: Running the OS Project Editor

When migrating to a new product version, you must start the OS Project Editor in the project.

You must make project-specific changes to the basic data in the OS Project Editor.

Procedure

1. Select the "Tools > Convert project data" menu command in WinCC Explorer.
2. Select the project data to be converted:
 - Pictures and faceplates
 - Global libraries
 - Project libraries
 - Page layouts and line layouts
 - C and VB project functions and actions
 - C and VB standard functions
 - Data for Basic Process Control

4.1 Introduction

3. Select the configuration language of the WinCC project from which the project data originated.
4. Confirm with "OK".
The selected data is converted to the current version of WinCC.

WinCC projects that were created with versions prior to WinCC V7.0

Migrated WinCC projects with SQL Server 2000 databases

WinCC projects that were created with versions prior to WinCC V6.2 SP2 include database settings of the SQL Server 2000.

To access these databases with WinCC V7.4 and higher, you must adapt the compatibility settings.

You can find more information under "How to migrate SQL Server 2000 databases (Page 212)".

Note

No migration of a WinCC V6.2 SP3 project if a WinCC editor has never been opened before

If you have never opened an editor, for example, Alarm Logging or Text Library, in a WinCC V6.2 SP3 project, you cannot migrate the project.

See also

Important differences compared to previous versions (Page 207)

Conditions for Migration (Page 211)

How to migrate SQL Server 2000 databases (Page 212)

Additional steps during migration (Page 219)

Upgrading a Redundant System in Normal Operation (Page 222)

Upgrading WinCC (Page 52)

SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/de/en/view/44029132>)

4.2 Important differences compared to previous versions

Introduction

WinCC version V8.1 offers new and enhanced functions compared to the previous version. You can find an overview of the new features in the section "What's new in WinCC V8.1?".

Documentation of previous versions

As of WinCC V7, several WinCC controls have been replaced by new WinCC controls. You can still use these controls in migrated projects.

You can find the documentation on the replaced WinCC controls after the description of the current WinCC controls.

Changeover to Microsoft SQL Server 2022 in WinCC V8.1

As of WinCC V8.1, Microsoft SQL Server 2022 64-bit is used.

If you are working with WinCC projects that were created with versions prior to WinCC V6.2 SP2, read the notes under "How to migrate SQL Server 2000 databases (Page 212)".

WinCC-OPC-XML-DA Client and WinCC-OPC-XML-DA Server from WinCC V8.0 or higher

From WinCC V8.0 onwards, WinCC-OPC-XML-DA client and WinCC-OPC-XML-DA server will not be supported any more.

If you are working with WinCC projects that were created with versions prior to WinCC V8.0, read the notes for WinCC-OPC-XML-DA client under "Additional steps during migration (Page 219)".

WinCC Configuration Studio as configuration interface WinCC V7.3 and higher

WinCC Configuration Studio provides a simple and efficient means of configuring bulk data for WinCC projects.

The following editors have been integrated in WinCC Configuration Studio:

- Tag Management
- Menus and toolbars
- Text and graphic lists
- Alarm Logging
- Tag Logging
- Text Library
- User Administrator
- User Archive
- Horn

4.2 Important differences compared to previous versions

- Picture Tree
- Tag simulation

The WinCC Configuration Studio replaces the functionality of WinCC ConfigurationTool and WinCC Archive ConfigurationTool.

Conversion to Unicode in WinCC V7.2

Starting from WinCC V7.2, WinCC is Unicode-capable.

- The Asian version contains all functionalities of the European version.
- Projects created in the Asian version can be executed on a European version and vice versa. A "License Key USB Hardlock" is a prerequisite for running projects in Asian languages.
- An WinCC project may contain several languages. The languages do not need to have the same code page.
 - The text library may contain text in languages with different code pages. A text column is generated accordingly for each language. For this purpose, set a font that contains all necessary characters.
 - You may add different Runtime languages to a WinCC project, regardless of the code page of these languages. All languages listed in the text library are available in Runtime.
 - Process tag names may contain both Chinese and German characters, for example.
- Setup contains a project library for all languages.

NOTICE
<p>The source language of a project cannot be set more than once in the migrator</p> <p>You cannot rectify an incorrect setting of the source language, because a project can be migrated only once to the new version.</p> <p>Backup the projects and project libraries before you launch migration.</p>

The following must be installed for migration of Asian projects on a European operating system:

- Asian language support
- The code page for the respective language

The source language of the project must be known and set up for migration.

Exceptions

- Scripting components
VB scripts may contain texts in a specific language.
The C compiler does not support Unicode. This means you can save C scripts in Unicode, for example, but the compiler still converts them into multi-byte character strings (MBCS).
- Older Active X elements
- Channels, to ensure compatibility with the Channel Development Kit (CDK) and data types within the PLC.

Communication channels

WinCC "OPC UA" channel: Changed configuration as of WinCC V7.4 SP1

As of WinCC V7.4 SP1, you fully configure the OPC-UA channel in the WinCC Configuration Studio.

In Tag Management, the OPC UA connections are created parallel to the OPC channel.

When you use OPC UA in a WinCC project that was created with WinCC prior to V7.4, the connections and tags are automatically migrated with the project.

Adhere to the following sequence if you have exported WinCC OPC UA tags:

1. Import the exported WinCC OPC UA tags.
2. Migrate the WinCC project.

Controller SINUMERIK S7-300: Process communication via "SinumerikNC"

As of WinCC V8.1 you configure the process communication to a PLC "SINUMERIK S7-300" via the channel "SinumerikNC" instead of via "SIMATIC S7 Protocol Suite".

After migrating to V8.1, you will find "SINUMERIK S7-300" type PLCs configured in older versions under the "SinumerikNC" communication channel.

You still configure the process communication to a S7-300 control without SINUMERIK in the communication channel "SIMATIC S7 Protocol Suite".

Channels no longer supported

The following communication channels are no longer supported:

- WinCC V7.0 or higher:
 - Windows DDE
 - SIMATIC S5 Ethernet TF
- WinCC V7.5 or higher:
 - PROFIBUS FMS

If necessary, remove the connection prior to migration.

Alarm Logging

User text block "Comment"

For messages that are created with WinCC V7.5 SP2 or higher, the behavior of the message block has changed:

- In WinCC AlarmControl you can add several comments to a message.
- You cannot subsequently change a comment you have entered.
- All comments on a message are retained until a total of 4000 characters has been reached. The comment entered first always remains saved. The following comments are successively deleted when you add new comments.

4.2 Important differences compared to previous versions

For migrated messages, the user text block "Comment" behaves as in the previous versions:

- You can only enter one comment.
- The user who entered the comment can change the comment afterwards.
- The "Comment required" and "Signature required" properties have no effect on migrated messages.

Chip card reader

Chip card readers are supported as of WinCC V7.5 SP1 if they fulfill the following requirements:

- PC/SC v1.0 Specification
- ISO 7816 Standard

Only the following chip card readers were supported up to WinCC V7.5:

- Omnikey "CardMan Desktop serial 3111"
- Omnikey "CardMan Desktop USB 3121"
- Omnikey "B1 CardMan 9010/9011"
- Siemens Nixdorf "ifc B1"
- Smart Solutions "CT B1 Snuggle"

See also

[Conditions for Migration \(Page 211\)](#)

[How to migrate SQL Server 2000 databases \(Page 212\)](#)

4.3 Conditions for Migration

Introduction

You can migrate a WinCC project on any computer on which WinCC has been installed. The WinCC Project Migrator is included in the standard installation scope of WinCC.

Use Project Duplicator to copy the configuration data of the project to the migration computer. For information on copying projects, refer to the "Working with projects" > "Copying and duplicating projects" section in the WinCC Information System.

The code page settings of projects that you want to migrate in a single step must be uniform.

Requirements

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

	Requirement
Operating system	The requirements are specified in the "Hardware requirements" and "Software requirements" section of the installation instructions.
CPU	
RAM	
Free storage space on the hard disk	In addition, at least the size of the overall project. Migration increases the size of the projects.
User Rights	User must be a member of the "SIMATIC HMI" group
WinCC version installed	WinCC V8.1
WinCC version project data	WinCC V8.0, V7.5 (SP1/SP2) or V7.4 SP1 Make sure that the latest WinCC updates for the respective WinCC version have been installed.
Licenses	V8.1 RC license or RT license for PowerTags
System status	WinCC closed: <ul style="list-style-type: none"> • Runtime deactivated • WinCC Editors closed • WinCC Explorer closed

See also

Important differences compared to previous versions (Page 207)

Hardware requirements for installing WinCC (Page 19)

Software requirements for installing WinCC (Page 21)

WinCC Installation Requirements (Page 18)

Quick Reference Instructions: Upgrading Redundant Systems in Normal Operation (Page 223)

How to migrate SQL Server 2000 databases (Page 212)

Upgrading a Redundant System in Normal Operation (Page 222)

4.4 How to migrate SQL Server 2000 databases

WinCC projects that were created with versions prior to WinCC V6.2 SP2 include database settings of the SQL Server 2000.

To access databases with the current SQL Server that were created with versions prior to SQL Server 2005, you must change the compatibility setting.

To do so, use the SQL Server Management Studio up to maximum SQL Server 2008. You connect the database using the *.MDF file, change the settings and remove the database once again.

Edit all databases that are part of your WinCC project:

- Databases in the local WinCC project
- Distributed systems: Databases on all PCs of the WinCC system
- Databases on the file server
- Databases on an archive server
- Swapped-out databases

Requirement

- You have created backup copies of the databases in the WinCC system. Back up the associated *.LDF file for each *.MDF file.
- The SQL Server up to version SQL Server 2008 is installed on the PC.

Procedure

1. Open the SQL Server Management Studio.
2. Connect to the WinCC instance. Enter the following path in the "Server name" field:
 - <Computer name>\WINCC
3. Select the entry "Append" in the shortcut menu of "Databases". The "Append databases" dialog opens.
4. Click "Add". The "Search database files" dialog opens.
5. Select the project database and confirm with "OK".
6. Select the item "Properties" in the shortcut menu of the database. The "Database Properties" dialog opens. In the "Options" view, the field "Degree of compatibility" has the entry "SQL Server 2000 (80)".
7. In the "Degree of compatibility" drop down list under "Options" select the entry "SQL Server 2008 (100)". Confirm your entries with "OK".
8. Select the item "Tasks > Disconnect" in the shortcut menu of the database. The "Disconnect database" dialog opens.
9. Confirm your entries with "OK". The connection to the database was disconnected.
10. Repeat steps 3 to 9 for each database that is part of the WinCC project.

Result

The WinCC project can be migrated.

See also

Conditions for Migration (Page 211)

4.5 How to migrate the WinCC data

Introduction

This chapter describes the migration of WinCC projects via the "WinCC Project Migrator".

Make sure that the latest WinCC updates for the respective WinCC version have been installed.

With the WinCC Project Migrator you migrate one or more projects simultaneously.

The following possibilities are available to start the Project Migrator:

- The Project Migrator opens automatically when the WinCC project to be migrated is opened.
- Start the WinCC Migrator via the Windows Start menu.

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

Note

Upgrading of versions > V7.4 SP1

Migration is not required for WinCC projects from WinCC V7.4 SP1.

Instead convert the project data via "Tools > Convert Project Data".

Duration of the migration

The time it takes to migrate a project depends on the project size and computer performance.

The time it takes to migrate the runtime data varies depending on the number of messages and tags. The operation may take several hours.

Note

Creating a backup

Generate a backup copy of the project prior to migration.

You can rely on this copy of the original project to retrieve your data if migration fails.

Upgrading of versions < V7.2

- WinCC projects before V7.2 are migrated to UNICODE.
Tables that do not originate from WinCC are excluded from migration.
- If you have used a DDE connection in WinCC prior to V7.0, you must remove this connection prior to migration.
DDE is no longer supported as of WinCC V7.0.
- We know from experience that some customer projects cannot be upgraded with version jumps.
If appropriate, migrate from version to version: V6 > V7.0 > V7.2 > V7.4 SP1 > V7.5 > V8.1

More information on migration of WinCC versions V4 or higher is available under the following URL (entry ID=44029132):

- SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/de/en/view/44029132>)
-

Using WinCC Project Migrator to migrate the WinCC projects

1. In the "Siemens Automation" Windows program group, select the entry "Project Migrator". Project Migrator opens with the "CCMigrator - Step 1 of 2" start window.
2. Select the project directory in which the WinCC project is located by clicking the button "...". If migrating several projects, select the corresponding paths of the directories that contain the WinCC projects.
3. Set the language of the computer on which you have created the project or projects. The language version that was set in the OS language options for non-Unicode programs or in the system locale is set by default.
4. Click "Migrate".
The "CCMigrator - Step 2 of 2" window opens. Project Migrator displays the migration steps. Wait for successful completion of the migration.
The migration of a project may take several hours.
5. If migration was successfully completed, the Project Migrator sends the following message: "WinCC project migrated successfully".
6. Click "Finish".

See also

How to Perform an Upgrade Installation (Page 53)

SiePortal: FAQ Migration V4 > V7 (<https://support.industry.siemens.com/cs/de/en/view/44029132>)

4.6 How to migrate S7 projects

Introduction

You have three options for migrating S7 projects < WinCC V7.4 SP1:

- Migration of the configuration data and Runtime data of an S7 project when opening the old project
- Using SIMATIC Manager to migrate an S7 multi-project
- Using WinCC Migrator to migrate several WinCC projects in a single step
This last option includes the WinCC projects, but not the S7 project.
The OM database is migrated the next time you open the S7 project.

Note

Creating a backup

Generate a backup copy of the project prior to migration.

You can rely on this copy of the original project to retrieve your data if migration fails.

Migrating an S7 project

1. Open the S7 project.
You are prompted to start migration.
2. Click "Yes".
The WinCC Migrator opens.
The project path is set by default. You cannot select or enter a different path.
3. Set the language of the computer on which the project was created.
The language version that was set in the OS language options for non-Unicode programs or in the system locale is set by default.
4. Click "Migrate".
Wait for successful completion of the migration.
5. Acknowledge the prompt to wait for completion of the migration.
Migration is completed and the S7 project opens.

Migrating an S7 multi-project

1. Open the S7 multi-project.
 - Proceed to step 2 if none of the project partitions is opened automatically.
 - Otherwise, the project is migrated as specified in chapter "Migrating an S7 project".

Wait for completion of the migration. Then proceed as follows:

You may also open one project partition after the other and migrate them separately.

2. Select the "Migrate OS projects" command in the "Tools" menu of SIMATIC Manager.
The WinCC Project Migrator opens. You cannot select or enter a different path.

3. Set the language of the computer on which the project was created.
The language version that was set in the OS language options for non-Unicode programs or in the system locale is set by default.
4. Click "Migrate".
Wait for successful completion of the migration.
5. Confirm the final prompt.
Migration is complete.

Using WinCC Migrator to migrate all integrated WinCC projects

You may also use WinCC Migrator to migrate all integrated WinCC projects. The procedure corresponds with the description in "How to migrate WinCC data".

You are prompted to start migration if you now open an S7 project.

Click "Yes" to open WinCC Migrator.

You are informed of the updated state of the project as soon as you click "Migrate".

Note

Migrating all components of an S7 project

You must first migrate all components of an S7 project before you can work on this project.

Operation of a partially migrated project may result in inconsistencies.

4.7 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. You can rely on this copy of the original project to retrieve your data if migration fails.

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 on the WinCC clients in the new WinCC version either. 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 all necessary data to clients which do not run their own project.

Multi-user System with Several Servers

If clients which run their own project were used in your original project, migrate each client project separately. 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 Project Duplicator for the configuration data. 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.

4.8 Additional steps during migration

Introduction

You still have to modify some project settings after a migration or conversion.

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.

You must convert these tags to adapt their assignment, for example, in Controls.

For this purpose, open the "Properties" dialog of the archive tag once and then close it again without making any changes.

If you are not using the "Compile OS" function, you can continue using the process-controlled archive tags in their original structure in the new WinCC version.

Multi-user projects Loading packages

After migration of a multi-user project, create the packages on the server and downloaded these to the clients.

For more information, refer to "Configuration > Distributed systems > Server configuration" or "Client configuration" in the WinCC Information System.

Tags of the WinCC-OPC-XML-DA client will be converted

The WinCC-OPC-XML-DA client is not available any more after the migration.

During the migration of WinCC-OPC XML DA client, a group with the name of the OPC connection is created under "Internal Tags" in the Tag Management.

The tags of the WinCC-OPC XML DA clients are converted into internal tags. Additional parameters, for example addresses, are converted into comments.

Activate OPC-DA server, OPC-A&E server or OPC-HDA server

If you are using OPC-DA server, OPC-A&E server or OPC-HDA server, activate the application "OPC-DA server, OPC-A&E server, OPC-HDA server".

You can activate the application in the Editor "Computer" of the WinCC Configuration Studio in the "Processes when starting WinCC Runtime" tab.

For security reasons, these servers are deactivated by default.

Customized ActiveX controls: Check Redistributable version

Microsoft Redistributable Packages for Visual Studio C++ 2015 are installed along with WinCC.

For example, if you are using ActiveX controls or Visual Basic projects created with versions prior to Visual Studio 2015, you must install the corresponding package.

The installation files for redistributables < Visual Studio 2015 are included in the WinCC scope of delivery:

- "Additional Content" DVD:
"VCRedist" folder

Select the setup for the required version:

- 2005x86 / 2005x64
- 2008x86 / 2008x64
- 2010x86 / 2010x64
- 2012x86 / 2012x64

WinCC/WebUX: Converting project data

Converting process pictures and faceplates

To use process pictures and faceplate types that were created with a previous version in WebUX, convert the pictures:

1. In the data area of the "Graphics Designer" editor in WinCC Explorer, sort the files by the column "Type".
2. Open the pictures marked as "web-enabled" in the Graphics Designer.
3. Save and close the pictures.

Alternatively, convert the pictures in the WinCC Explorer.

However, all process pictures and faceplates are converted with "Tools > Convert project data". Depending on the project size, this conversion can take some time.

WinCC projects prior to WinCC V7.4

Project data created with an earlier version must be adjusted for use in WinCC/WebUX as of WinCC V7.4:

- If you have already used WinCC/WebUX V7.3, convert the process pictures and project functions (Visual Basic Script).
- If you want to use process pictures with migrated VB project functions in WebUX as of V7.4, convert the project functions.

Procedure:

1. In the WinCC Explorer, select the menu command "Tools > Convert project data".
2. Select the project data to be converted and confirm with "OK".
 - Pictures and faceplates
 - C and VB project functions and actions
3. Confirm with "OK".
The selected data is converted to the current version of WinCC.

WinCC/WebNavigator / WinCC/DataMonitor: WinCC Web Publishing Wizard

As of WinCC V7.5 SP2, unchanged files that have already been published cannot be republished.

In the WinCC Web View Publishing Wizard, these files are displayed in gray.

To use this function for migrated projects, publish the corresponding files after migration once with the WinCC Web Publishing Wizard.

You open the WinCC Web Publishing Wizard in Windows via "PublishingWizard" or in the WinCC Explorer in the "Web Navigator" shortcut menu via "Web View Publisher".

See also

[Introduction \(Page 203\)](#)

[Migration Diagnostics \(Page 234\)](#)

4.9 Upgrading a Redundant System in Normal Operation

4.9.1 Upgrading a Redundant System in Normal Operation

Introduction

You update a redundant system to the new WinCC version in steps. This will not interfere with plant operation.

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

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

An upgrade in WinCC ServiceMode is not possible in logged off state.

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

See also

Quick Reference Instructions: Upgrading Redundant Systems in Normal Operation (Page 223)

4.9.2 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

Note

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: Install new WinCC version
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: Install new WinCC version

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: Install new WinCC version

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

Result

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 your redundant system to the new WinCC version is complete.

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.

See also

Phase 1: Upgrading the Standby Server (Page 225)

Conditions for Migration (Page 211)

4.9.3 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.

You system will only run on one server while you complete the phase 1 steps.

NOTICE**Procedure**

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

Complete the steps in phases 1 to 4 without any longer interruption.

Note

Create a backup copy before upgrading the server.

Initial Situation Prior to Phase 1

- Server1 is the configured default master server.
(Server1 is synonym for any master server of a redundant pair of servers.)
- Server2 is the standby.
(Server2 is synonym for any standby server of a redundant pair of servers.)
- WinCC Client1 is connected to Server1.
The package of the master server is loaded onto WinCC Client1.
- (WinCC Client1 is synonym for all WinCC clients that were originally connected to Server1 and which have to be reconnected with Server1 after migration.) WinCC-Client2 is connected to Server2 because this is its configured preferred server.
The master server package is loaded on WinCC Client2.
(WinCC-Client2 is synonym for all WinCC clients that were originally connected to Server2 and which have to be reconnected with Server2 after 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 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: Install new WinCC version

The WinCC server with the new WinCC version runs only under the system conditions described in the "Installation Notes" of the WinCC Information System.

Install the new WinCC version with all necessary options or run an update. Information on installation is available in the WinCC Information System under "Installation Notes".

7. Server2: Migrate project

Migrate the WinCC data of Server2.

Modify the project for the new WinCC after the migration. Observe the corresponding notes in the chapter "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 project.
- The WinCC Client1 remains connected to Server1.
- The WinCC Client2 remains connected to Server1.

Wait for completion of any active redundancy synchronization before you go to the next step. 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.

See also

Phase 2: Upgrade WinCC clients (Page 228)

Conditions for Migration (Page 211)

Additional steps during migration (Page 219)

4.9.4 Phase 2: Upgrade WinCC clients

Introduction

In phase 2, you upgrade all WinCC clients to the new WinCC version.

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 in advance of phase 2

- Server1 is the master server with the previous WinCC version.
- Upgraded Server2 is the standby server in the migrated project with the new WinCC version.
- WinCC Client1 is connected to Server1.
- WinCC Client2 is connected to Server1.

Phase 2 procedure

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: Install new WinCC version

A WinCC client with the new WinCC version runs only under the system conditions 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 the new WinCC version with all necessary options or perform an update. Information on installation is available in the WinCC Information System under "Installation Notes".

13. WinCC Client2: Migrate project

Migrate the WinCC data of the WinCC client.

Modify the project for the new WinCC version after the migration. Observe the corresponding notes in the chapter "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 the master server with the previous WinCC version.
- Upgraded Server2 is the standby server in the migrated project with the new WinCC version.

See also

Phase 3: Upgrading Master Server (Page 230)

Additional steps during migration (Page 219)

4.9.5 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 the master server with the previous WinCC version.
- Upgraded Server2 is the standby server in the migrated project with the new WinCC version.
- 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: Install new WinCC version

A server with the new WinCC version runs only under the system conditions described in the "Installation Notes" of the WinCC Information System. First, save the WinCC data on the server if necessary.

Install the new WinCC version with all necessary options or perform an update. Information on installation is available in the WinCC Information System under "Installation Notes".

20. Server1: Migrate project

Migrate the WinCC data of the server. Modify the project for the new WinCC version after the migration. Observe the corresponding notes in the chapter "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.

See also

Phase 4: Defining Master Server and Completing Upgrade (Page 232)

Additional steps during migration (Page 219)

4.9.6 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 instructions in step 25. This step concludes the upgrading procedure of your redundant system to the new WinCC version.

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 your redundant system to the new WinCC version is complete.

4.10 Migration Diagnostics

Introduction

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

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.

Check the list of migrated components after migration. Double-click the list entries that contain errors or warnings to view the error in a ".txt" file.

Cancelation of Migration

You may restart an aborted migration after having eliminated all errors. Use a backup copy instead of the project containing the migration errors.

Migration after elimination of errors

You can migrate the individual components after having eliminated the respective errors. The computer name and the name of the local computer must match.

Select "Tools > Convert project data" in WinCC Explorer. Select the components that you want to migrate.

Diagnostics file

The Project Migrator saves the "MigratorLog.txt" diagnostics file to the directory of the migrated project. You can view this file in any text editor.

The file contains the following general information:

- Project name
- Project type
- Type of migrated data
- Start and end of migration

If an error occurs during migration, the Project Migrator writes an error message in the file.

4.11 Appendix

4.11.1 Picture modules

4.11.1.1 Picture modules

Documentation of Functions of Predecessor Versions

The wizards for the picture-in-picture technology are only included for compatibility reasons.

Note

Limitations

These wizards are only available if the project was not edited with the OS Project Editor.

The picture module technology on which the wizards are based is not supported by the WinCC/WebNavigator and WinCC/WebUX options.

Create picture module as type - V 1.14

This wizard is used to configure the assignment between the object properties of the picture and the structural components of a structured data type.

- Supply output value of an I/O field every second with .actual value
- Provide data to the process connection of a bar graph at intervals of two seconds.
Temperature

Here .actual value and .temperature are components of a structured data type

The original picture has become a type picture.

Create instance(s) in the process picture - V 1.14

With this wizard you can create a picture window in a parent picture and then call a type picture in this picture window.

When doing so, you specify which tag of a structured data type the picture window works with and at which position the picture window is placed.

The instance wizard enables the positioning of picture windows in several ways:

- as a fixed component in the picture
- as a displayable component which can be called using a button
- as several displayable components which can each be called using a button
- as a fixed component with a selectable name .he name of the component can be pre-assigned with a tag.

See also

- Picture-in-picture method (Page 236)
- Configuring picture modules (Page 240)

4.11.1.2 Picture-in-picture method

Motivation

The picture module technology allows the reduction of configuration and maintenance costs: Process objects of the same type often appear several times in process pictures, e.g. motors, pumps, valves or controllers. To minimize the configuration effort, standardize the display and operation of these objects.

Create a picture module, which you then copy, rename and use multiple times. Each call of the picture module works with its own data.

Use structure tags for the dynamization.

For information on how to use the Dynamic Wizard to configure the picture-in-picture technology, see:

- "Configuring picture modules (Page 240)"

Use of picture windows

In process pictures, you can insert picture windows in which additional process pictures are displayed.

The picture-in-picture technology inserts the same process picture into several picture windows of a parent picture.

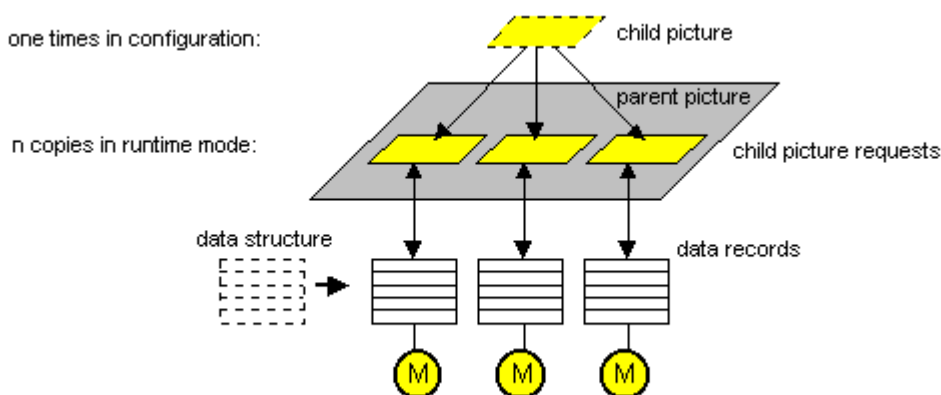
In Runtime, each of the picture windows displays a copy of the same process picture that was created and configured only once.

Every picture window works with its own data in Runtime.

This enables you to centrally change picture parts that are required several times in the same form.

Central configuration/Changing process object displays

Each Runtime copy that is called as instance of a type picture, works with its own structured data set:



WinCC offers the opportunity to define structured data types yourself and to create tags of exactly this structured data type afterwards.

Creating picture modules

To create a picture module using picture-in-picture technology, create a process picture in the Graphics Designer.

Create the graphical layout and internal processing, such as direct connections between object properties. However, do not configure a connection to the process and do not use process tags.

Configure the process connection to the structure tags that are used in the picture module instances.

Dynamic Wizard

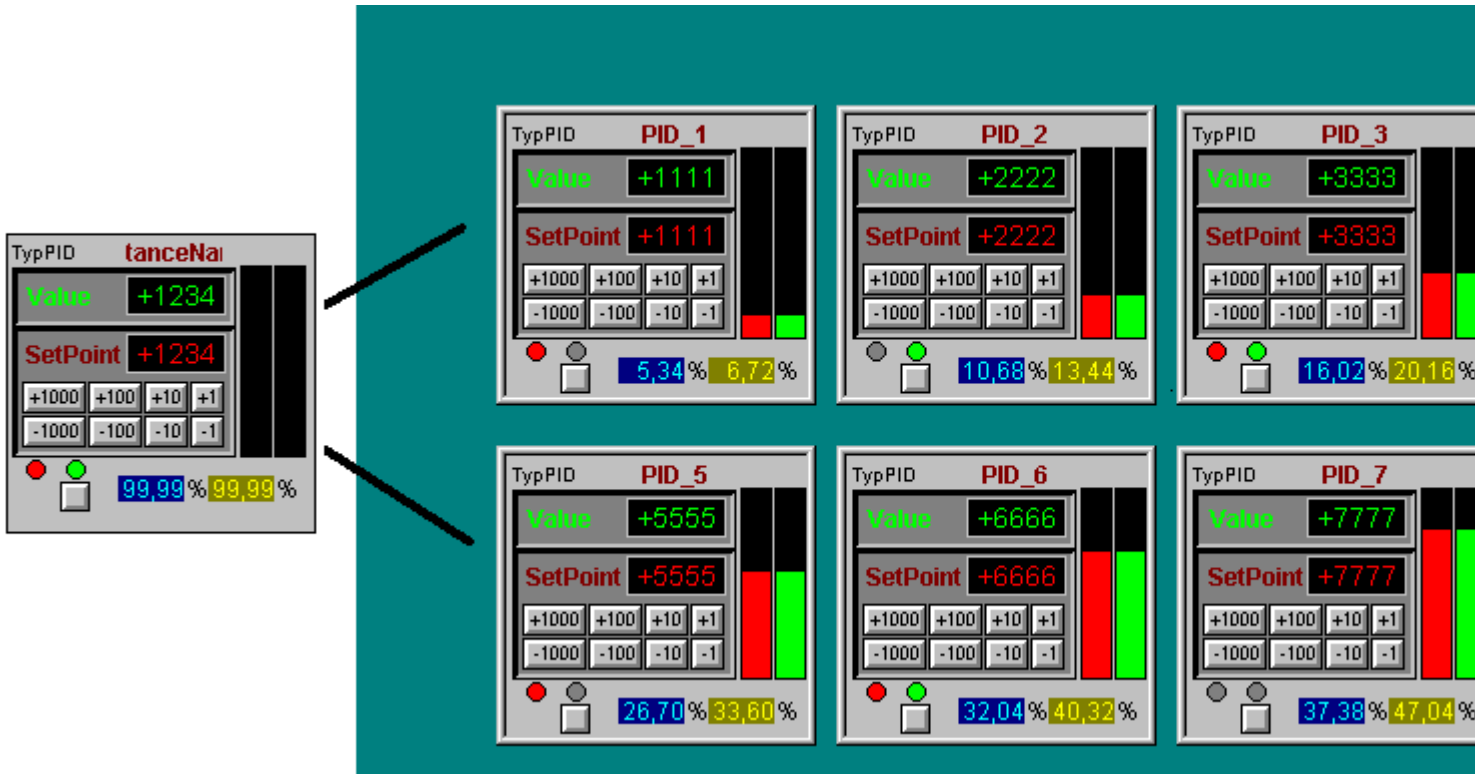
With the Dynamic Wizard "Picture-Module template" you create the assignment between an object property and structure tags.

After the Dynamic Wizard has run, the object is dynamized with the structure type. The process picture became a type picture.

Creating instances

With the Dynamic Wizard "Picture-Module instances" you create the picture window in the parent picture in which the type picture is called.

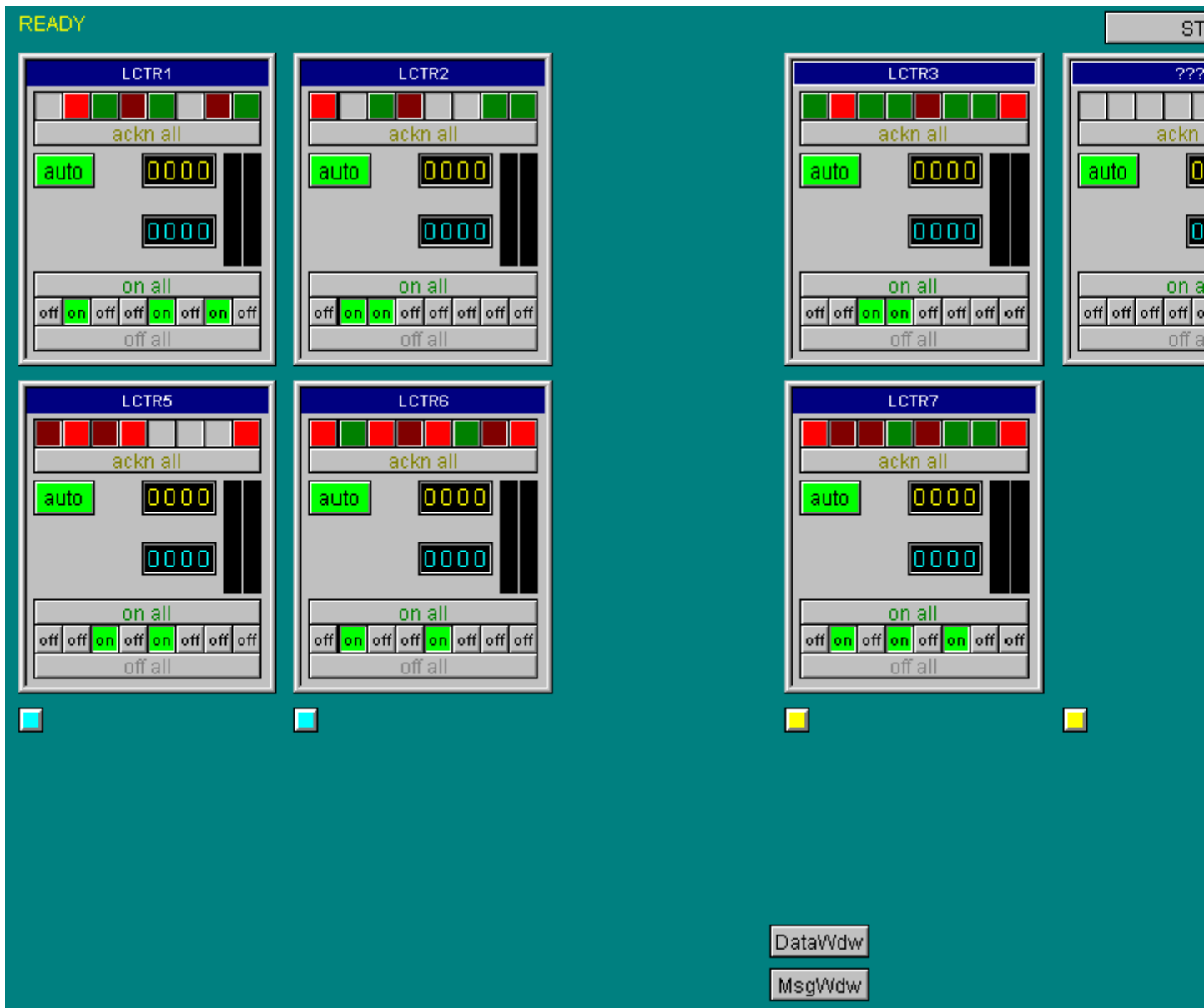
You specify which tags of the structured data type are used by a picture window and where the picture window is placed.



Integrating picture module instances

The picture shows the four options for picture window calls that you can select in the Dynamic Wizard:

Example picture	Description
Top left	The picture windows are displayed in the parent picture. The type picture in the picture window is supplied with data when the parent picture is opened. The data connection cannot be changed in Runtime.
Top right	The picture windows are displayed in the parent picture. During the open picture of the parent picture, the type picture in the picture window is either supplied with data from a default object or is not supplied with any data. You can change the name of the displayed process object in Runtime.
Bottom left	One or more buttons are placed in the picture. The associated picture windows are hidden when the parent picture is opened. Each button toggles the visibility of its assigned picture window. When the type picture is displayed, it is filled with the corresponding data.
Bottom right	One or more buttons are placed in the picture. All buttons toggle a common picture window that is hidden when the parent picture is opened. The last button pressed determines the data with which the displayed type picture is supplied.



See also

- Picture modules (Page 235)
- Configuring picture modules (Page 240)

4.11.1.3 Configuring picture modules

Picture-in-picture method

The configuration consists of two steps:

- Creating a picture module as "type picture"
- Inserting a picture module instance in the process picture

For information on using the picture module technology, see:

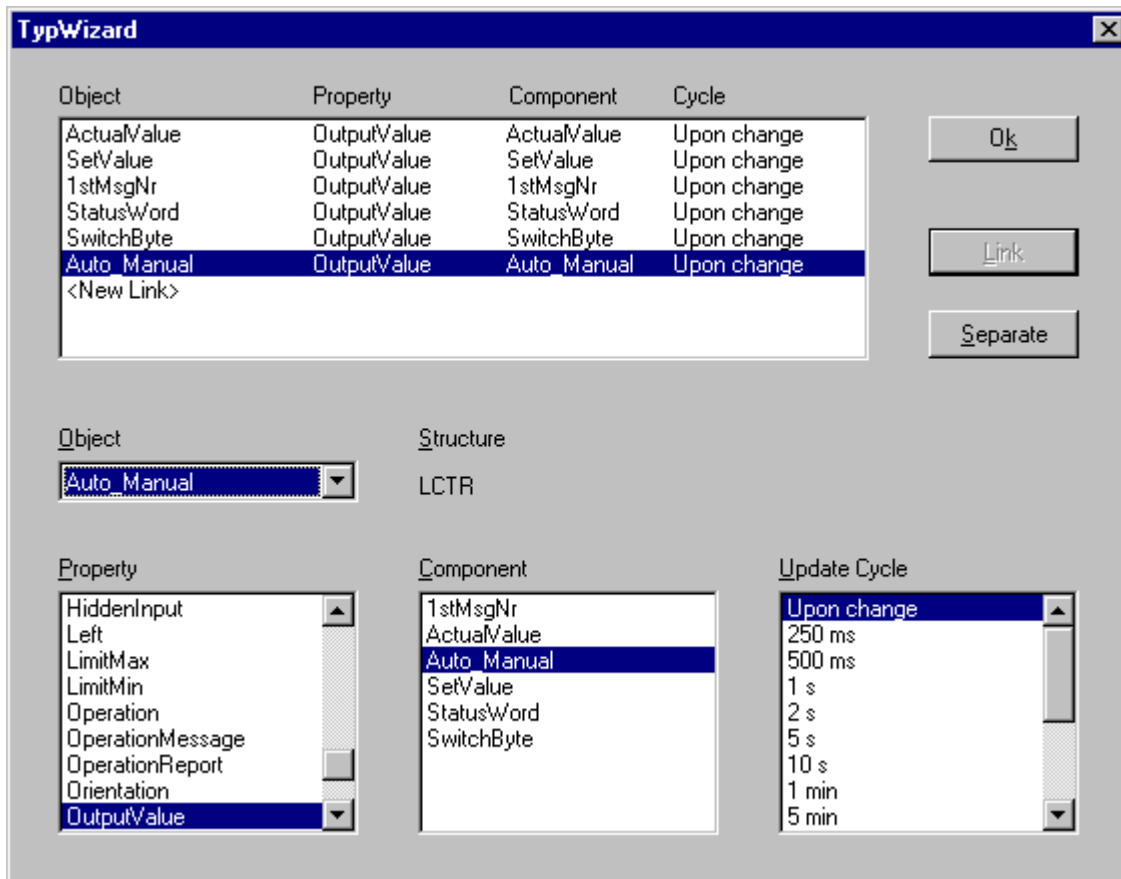
- "Picture-in-picture method (Page 236)"

Creating a picture module as "type picture"

Procedure

1. Create a structure type and the associated structure tag elements under "Structure tags" in the Tag Management.
2. Create a process picture and reduce the width and height, e.g. to 150x170 pixels.
3. Place several WinCC objects and give them unique names.
4. Start the Dynamic Wizard "Picture-Module template".
The wizard displays the available structure types.
5. Select a structure type.
6. In the "Object" drop-down list, select one of the objects in the process picture.
7. Select an object property, a structure type element under "Component", and the update cycle.

- Click "New Link" and "Link".
The object property is dynamized with the selected structure tags.



- Confirm your selection with "OK" and exit the wizard with "Finish".

Result

A picture module is generated as "Type picture" from the process picture.

The type picture is saved under the following name: "@TYPE_<PictureName>.PDL"

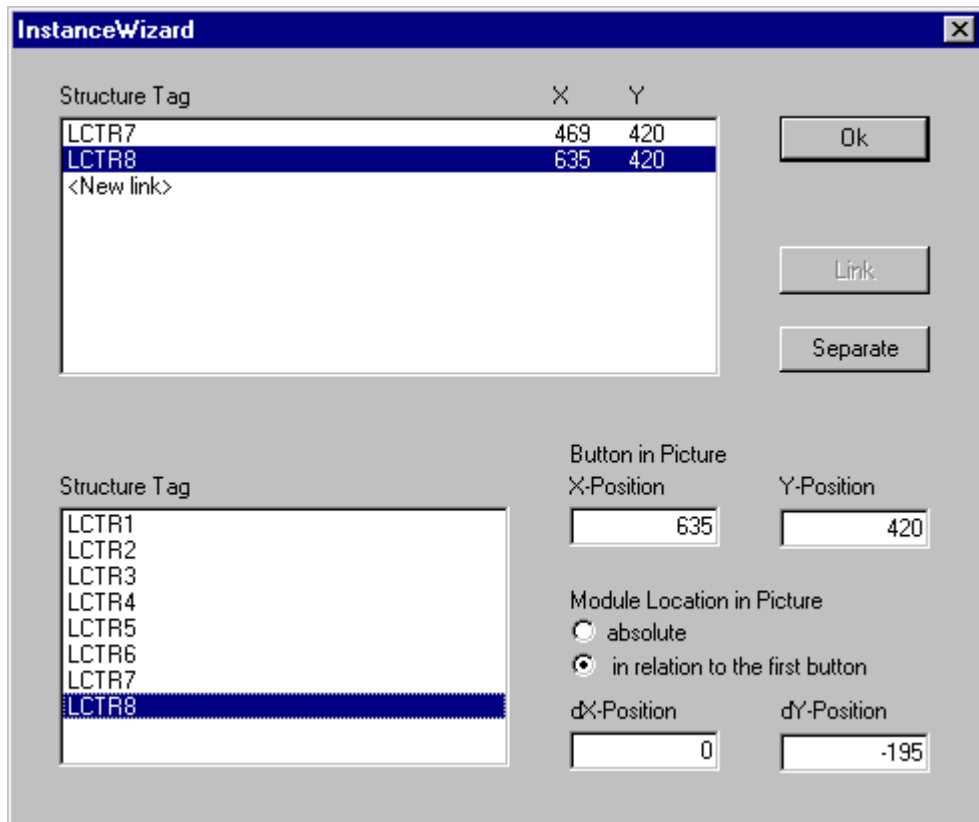
An I/O field "InstanceName" is inserted at the top edge of the picture, which displays the respective name of the picture module instance in Runtime.

If you change the contents of the picture module, call the wizard again. This transfers the changes to the instances.

Inserting a picture module instance in the process picture

- To insert an instance into a process picture, open a new process picture and start the Dynamic Wizard "Picture-Module instances".
- Select the type picture.
- Select how the picture module instance is inserted and click "Next".
- Select the structure tag with which the structure type elements are linked and the position of the picture module in the process picture.

5. Click "New Link" and "Link".



6. Confirm your selection with "OK" and exit the wizard with "Finish".

Result

The faceplate instances are inserted as picture windows in the process picture.

You can then change the position and size of the picture window.

See also

Picture modules (Page 235)

Picture-in-picture method (Page 236)

Licensing

5.1 Software Has a Value

Usage Authorization

With the purchase of the WinCC software you obtain an unrestricted right to usage of the software. You are entitled to our warranty, our support and service.

The software is protected against unlawful use. The programs protected in such a manner can run only in an unrestricted manner when a valid license for the software package has been transferred to the hard disk of the corresponding computer.

Each installed software requires a valid license for unrestricted operation. Without a valid license, WinCC software can only be used in Demo mode.

See also

Basic license types and license types in WinCC (Page 249)

Overview of the licensing (Page 244)

5.2 Overview of the licensing

Introduction

When you purchase the WinCC Basic software package or a WinCC option you obtain license keys in the following form:

- As storage medium with license keys
- Via the internet (online software delivery)

During the installation of the licenses, the required license keys are copied to the hard disk of the PC.

The installed software is released for unrestricted use.

WinCC ASIA version

The same conditions apply when you use a WinCC ASIA version. You need a "License Key USB Hardlock" (dongle).

For more information, refer to the WinCC installation notes under "Activating and testing ASIA licenses".

Management of the license keys

Automation License Manager (ALM)

The supplied program "Automation License Manager" is used to manage the license keys.

It allows you to transfer a license key at a later time.

You can also install the Automation License Manager on a PC without WinCC, e.g. on a license server. To do this select "User-defined installation" and the entry "Automation License Manager" in the "Options" area.

Note

ALM installation without WinCC: Firewall

If you install the Automation License Manager as license server without WinCC, you also need to customize the firewall settings.

At least "File and Printer Release" must be enabled in the firewall.

Storage path

During first transfer of a license key, the Automation License Manager creates a folder "AX NF ZZ" on the hard disk.

The folder has the "system" and "hidden" properties and is automatically deleted when the last license key is removed.

NOTICE**Do not change names and properties of the "AX NF ZZ" folder**

You may change neither the name nor the properties of the "AX NF ZZ" folder because the transferred license keys can be irretrievably lost.

While transferring a WinCC license to the hard disk, a cluster is marked as "defective". Do not attempt to restore this cluster.

Hence you must remove the license keys before each backup or exclude them from the backup.

Copy protection

Copy protection prevents copying of license keys to a license data storage medium or hard disk.

Encryption technology and manipulation of the physical file structure prevent a license key for a protected program from being copied "functionally".

RT and RC licenses

WinCC differentiates between RT licenses (Runtime) and RC licenses (Runtime and Configuration) as well as the number of tags.

- RT licenses permit the operation of WinCC in Runtime 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 for an unlimited period of time and during configuration.
You can use RC licenses locally or remotely:
 - If an RC license is located on another PC, it is only valid for the configuration.
 - If you want to use Runtime, the RC license must be available locally or you need an additional RT license.
- The number of external tags and archive tags permitted for configuration is indicated by the number in brackets.
Example "WinCC RC (65536)": With this license, you can use up to 64*1024 external tags and up to 512 archive tags in Runtime.
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 were no licenses at all.

Note**WinCC client**

On a WinCC client, the maximum number of external tags and archive tags is always permitted with an existing RT/RC license because the number of tags is only checked on a server.

Client licensing for "RT Client" and "RC Client"

You can use these licenses both for WinCC clients without their own project as well as for WinCC clients with their own project.

Constraints:

- Microsoft SQL Express must be installed.
If the SQL Standard Server is installed, the "RT Client" license causes display of a license message that requires acknowledgment.
- The database on the client is limited to a maximum of 2 GB due to the use of Microsoft SQL Express.
- The SIMATIC Information Server requires the SQL Standard Server.
This means the Information Server cannot be installed on the RT Client PC.
- The Client Upgrade package contains either only the RT Client upgrade or only the RC Client upgrade.
SIMATIC NET and other options, for example WinCC/WebNavigator, are not included in this Client Upgrade package.

More information: SiePortal: FAQ 7336024 (<https://support.industry.siemens.com/cs/ww/en/view/7336024>)

Powerpack

The number of external tags (PowerTags) for a WinCC software configuration can be upgraded with Powerpack:

- Upgrade license for PowerTags (process tags)

For the Powerpack of the PowerTags, we offer the "WinCC RT (...) Powerpack" and "WinCC RC (...) Powerpack" packs.

If the permissible number of PowerTags is exceeded in Runtime, WinCC switches to demo mode.

Note

Use Powerpack only for license upgrade

By using Powerpack, you only increase the number of licensed tags (PowerTags).

The Powerpack cannot be used to operate the WinCC software.

Powerpack installation is possible only once

You can use the Powerpack only once to upgrade the system.

Archive licenses

Archive licenses belong to the basic "Floating" type; however, they always need to be transferred locally to the PC.

You can cumulate archive licenses:

- If you transfer several single archive licenses locally to a PC, the permitted configuration limits for Runtime are derived from the sum of the individual archive licenses.

The following applies for the counting of the licenses for the archive:

- The tags for the process value archives are counted individually. The number of tags is checked in Runtime.
- The tags for the compressed archives are not included in the license count.
- WinCC User Archive requires a license only for Runtime.
- A license to use 512 archive tags is included in the RT and RC licenses. If you want to use more than 512 archive tags in Runtime, you have to upgrade the system with archive licenses. The 512 archive tags are not cumulated.
- To upgrade archive licenses, you must install additional archive tags. You do not need Powerpack for archive licenses.

Example: Cumulation of archive licenses

The table shows an example for gradual expansion of archive tags.

Installed licenses	Additionally purchased licenses	Licensed archive tags	Comment
WinCC RC (...)	-	512	Basic licenses included 512 ArchiveTags
WinCC RC (...)	WinCC Archive (1500 Tags)	1500	The installed archive license includes the 512 ArchiveTags of the basic license
WinCC RC (...) WinCC Archive (1500 Tags)	WinCC Archive (5000 Tags)	6500	With an additional archive license, the 1500 ArchiveTags are upgraded to 6500 ArchiveTags.

Avoiding errors when handling licenses

Remove all license keys on the hard drive before performing any of these actions:

- Use hard disk optimization program for moving fixed blocks
- Format, compress, or restore hard disk
- Installing a new operating system on the PC

It is not possible to use compressed hard disks or disk drives.

If a backup contains copies of the license keys, you run the risk that the existing valid license keys are overwritten and therefore destroyed when you restore the backup files on the hard disk.

If you lose a license key, you can try to restore this license again. More information: "Restore license key (Page 260)"

See also

Basic license types and license types in WinCC (Page 249)

Restore license key (Page 260)

Licenses and Licensing (Page 12)

Scope of delivery (Page 9)

SiePortal: FAQ 7336024 (<https://support.industry.siemens.com/cs/ww/en/view/7336024>)

5.3 Basic license types and license types in WinCC

Introduction

Each valid license key for WinCC is provided with a 20-digit license number. This number is also transferred by the license medium to the PC when the license key is transferred.

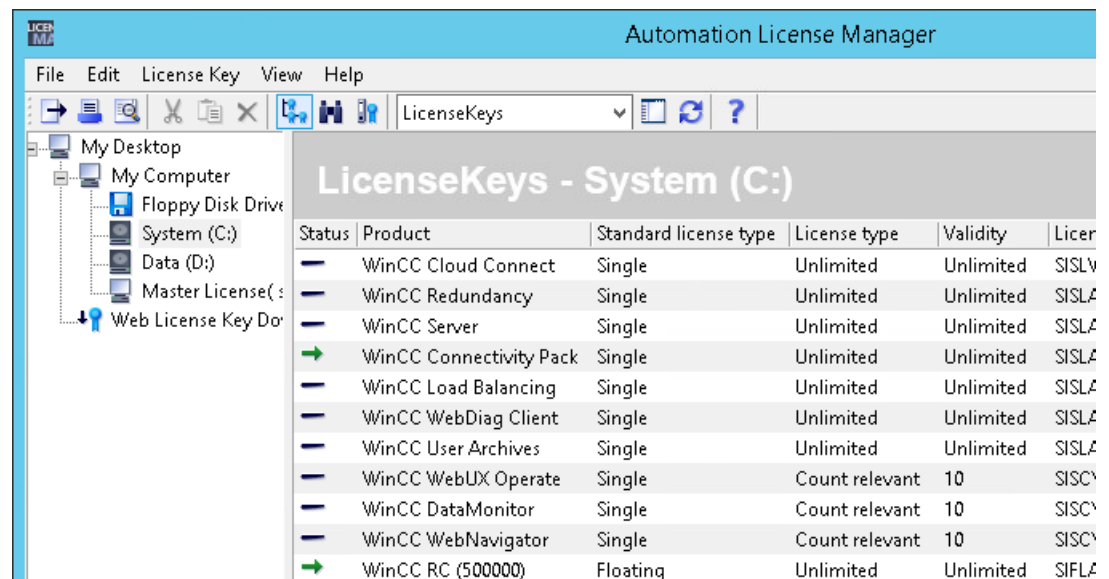
You can have the license numbers with the associated basic license types and license types displayed with the "Automation License Manager" program.

Additional information is available in the online help of the "Automation License Manager".

Automation License Manager

The license keys are displayed in the "Manage" view.

The column display depends on the selected view.



Status	Product	Standard license type	License type	Validity	Licer
—	WinCC Cloud Connect	Single	Unlimited	Unlimited	SISLV
—	WinCC Redundancy	Single	Unlimited	Unlimited	SISLÆ
—	WinCC Server	Single	Unlimited	Unlimited	SISLÆ
→	WinCC Connectivity Pack	Single	Unlimited	Unlimited	SISLÆ
—	WinCC Load Balancing	Single	Unlimited	Unlimited	SISLÆ
—	WinCC WebDiag Client	Single	Unlimited	Unlimited	SISLÆ
—	WinCC User Archives	Single	Unlimited	Unlimited	SISLÆ
—	WinCC WebUX Operate	Single	Count relevant	10	SISC\
—	WinCC DataMonitor	Single	Count relevant	10	SISC\
—	WinCC WebNavigator	Single	Count relevant	10	SISC\
→	WinCC RC (500000)	Floating	Unlimited	Unlimited	SIFLÆ

Basic license types and license types

WinCC licenses are available as different basic license types and license types.

The software behaves differently for different types.

More information:

- SiePortal - Product catalog: SIMATIC WinCC V7/V8 (<https://mall.industry.siemens.com/mall/en/www/Catalog/Products/10042373?tree=CatalogTree&SiepCountryCode=WW>)

5.3 Basic license types and license types in WinCC

Basic license types	Description
Single	<p>Standard license with no time restrictions; you can transfer it to any computer and only use it locally there.</p> <p>The type of use is determined from the Certificate of License (CoL).</p> <p>Licenses of the type "Single" can be upgraded and identified with "SISL" in the license key.</p>
Floating	<p>License with no time restrictions; you can transfer it to any computer and use it there.</p> <p>You can also obtain the license from a license server over the network.</p> <p>If a WinCC RC license is present locally and remotely, WinCC always uses the local license.</p> <p>Read the installation notes of the Information Server to learn about particular features related to the archive licenses for the SIMATIC Information Server.</p> <p>If the "Floating" license is purchased via the network, the following applies:</p> <ul style="list-style-type: none"> • The Automation License Manager must be installed on the license server. • The license can only be used for configuration. • A WinCC RT or RC license must be available locally on the PC for Runtime. • After disconnection, the program is restarted only after 3 hours in demo mode. • The first free license on the license server is assigned. <p>Ensure that a sufficient number of licenses of the "Floating" type are available on the license server. The Floating licenses must license at least the tag number required in the project.</p> <p>If there are insufficient licenses, the requesting PC switches to the demo mode.</p> <p>Licenses of the "Floating" type can be upgraded and identified with "SIFL" in the license key.</p>
PowerPack Upgrade	<p>This license is used to increase the number of PowerTags.</p> <p>Licenses of the "PowerPack Upgrade" type are identified with "SIPP" in the license key.</p>
Upgrade	<p>This license is used to convert the current software version to a more recent version.</p> <p>Depending on the upgrade package, you can also upgrade several licenses.</p> <p>Licenses of the "Upgrade" type are identified with "SIUP" in the license key.</p>

License Types	Description
Count relevant	<p>With this license, the use of the software is limited to the number of tags or clients specified in the agreement.</p> <p>In case of several licenses of the "Count Relevant" type, the objects listed under "Validity" are added together.</p> <p>Read the installation notes of the Information Server to learn about particular features related to the archive licenses for the SIMATIC Information Server.</p> <p>The Count Relevant License is identified by "SIFC" or "SISC".</p>
Unlimited	<p>The number of tags or clients is not limited:</p> <ul style="list-style-type: none"> • You can use any number of tags in Runtime or during the configuration. • You can connect any number of web clients or WebUX clients <p>The maximum number of tags and clients depends on the system limits and the configuration of your system.</p>

License Types	Description
Trial	With these licenses, software utilization is limited to the WinCC Trial installation. The use is limited to 21 days from the first day of use. The software may only be used for purposes of testing and validation. The Trial License is identified by "SITT".
Master License Key	With this license, the software may be used without restriction. The Master License Key is identified by "SIEL".

See also

WinCC in the Demo Mode (Page 252)

Overview of the licensing (Page 244)

SiePortal - Product catalog: SIMATIC WinCC V7/V8 (<https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10042373?tree=CatalogTree&SiepCountryCode=WW>)

5.4 WinCC in the Demo Mode

Reaction to missing license

If a license is missing, WinCC runs in demo mode.

This allows you to operate WinCC for testing and presentation purposes or for local configuration modifications if only one WinCC RT license is available.

To exit WinCC demo mode, install the required licenses.

Note

When you subsequently transfer a license in the demo mode, it first takes effect when you restart WinCC.

Even without a license, process mode is fully functional without loss of data for archiving or alarm logging.

Missing WinCC RC licenses

If WinCC RC licenses are missing, the WinCC Explorer and the editors are terminated after one hour in demo mode.

You can use the editors and save the changes until demo mode expires.

Missing WinCC RT licenses

If WinCC RT licenses are missing, a message which prompts you to acquire a valid license and has to be acknowledged is displayed when you start Runtime.

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.

Missing licenses for WinCC options

If the license keys for WinCC options in use are missing, WinCC switches to demo mode, regardless of whether or not other license keys are available.

WebUX demo license

Missing licenses of WinCC/WebUX do not cause activation of demo mode.

With WinCC/WebUX you receive a demo license for accessing the WebUX server.

This allows a maximum of one user without a valid WebUX license or WebNavigator license to have read access to the project.

If another user without a WebUX license tries to log in, the login will be rejected.

See also

Licenses and Licensing (Page 12)

5.5 How to manage licenses

Introduction

You can manage the WinCC licenses with the Automation License Manager.

You can transfer licenses with the Automation License Manager:

- To use licenses on a computer with WinCC.
- To remove licenses from one computer so that the licenses can, for example, be used on another computer.
- To collect licenses on a drive so that the licenses of a WinCC software configuration can be transferred collectively.

More information:

- Online help of the "Automation License Manager"
- SiePortal: Managing authorizations and licenses for SIMATIC products (ID 114358) (<https://support.industry.siemens.com/cs/ww/en/view/114358>)

NOTICE
Write access to the license data storage medium
A write operation to the license data storage medium is performed each time you transfer or remove a WinCC license.
This means the license data storage medium must not be write-protected.

Note

Installing licenses before WinCC starts

Install all required licenses before you start WinCC.

If one of the required licenses is missing, WinCC switches to demo mode when the program starts.

Note**Multiple license variants are installed**

If multiple licenses are present, WinCC uses the license it finds first. In many cases, this license is not the most powerful license.

Make sure that only one RT license or RC license, not multiple licenses, are transferred.

Example

The following licenses are available on the PC:

- WinCC RC (65536)
- WinCC RC (128)

If the Automation License Manager uses the smaller license, only 128 tags are licensed. The license for 65 536 tags is not taken into consideration in this case.

To use all licensed tags, remove the "WinCC RC (128)" license.

Requirement

- Automation License Manager is installed.
- WinCC licenses or the license keys of other SIMATIC software can only be transferred using USB flash drives or uncompressed hard disk drives.
- You cannot transfer licenses to RAM drives, disks, compressed hard disk drives, etc.

Transferring licenses

1. Connect the WinCC license data storage medium with the computer.
2. Open the Automation License Manager in the "Siemens Automation" program group.
3. Select the drive in the navigation window. The WinCC licenses on the license data storage medium are displayed.
4. Select a license from the table. You can select more than one license for transfer.
5. In the shortcut menu of the license, select the "Transfer..." entry or drag-and-drop the licenses. The "Transfer license key" dialog opens.
6. Select the destination drive and confirm your selection with "OK".
7. The desired license is transferred and written to the destination drive.
8. If necessary, repeat the transfer of licenses from other license data storage media.

Removing licenses

1. Connect the WinCC license data storage medium with the computer.
2. Open the Automation License Manager in the "Siemens Automation" program group.
3. In the navigation window, select the drive where the license to be deleted is located. The WinCC licenses on the drive are displayed.
4. Select the required license in the table. You can also select multiple licenses for removal.

5. In the shortcut menu of this license select the entry "Transfer..." or drag-and-drop the licenses. The "Transfer license key" dialog opens.
6. Select the license data storage medium as the destination drive and confirm your selection with "OK".
7. The desired license is transferred and written to the destination drive.

See also

How to Upgrade Licenses (Page 257)

SiePortal: Managing authorizations and licenses for SIMATIC products (ID 114358) (<https://support.industry.siemens.com/cs/ww/en/view/114358>)

5.6 How to Upgrade Licenses

Introduction

Install a Powerpack with the Automation License Manager to upgrade the permitted number of external tags (PowerTags).

Note**Powerpack installation is possible only once**

You can use a Powerpack only once to upgrade the system.

Upgrading archive tags

If you want to expand the number of available archive tags, install an additional archive license. The procedure is as described under "How to manage licenses (Page 254)".

Requirement

- Automation License Manager is installed.
- Licenses to be upgraded are available on the computer
- PowerPack license key on a license data storage medium:

Procedure

1. Connect the license data storage medium with the computer.
 2. Open the Automation License Manager in the "Siemens Automation" program group.
 3. In the navigation window, select the drive where the license to be upgraded is located.
 4. Select this license from the table.
 5. In the shortcut menu of the license, select the entry "License Key > Upgrade...". The upgrade process is started.
 6. The upgrade process concludes with the transfer of the upgraded license to the local drive.
- Additional information is available in the online help of the "Automation License Manager".

See also

How to manage licenses (Page 254)

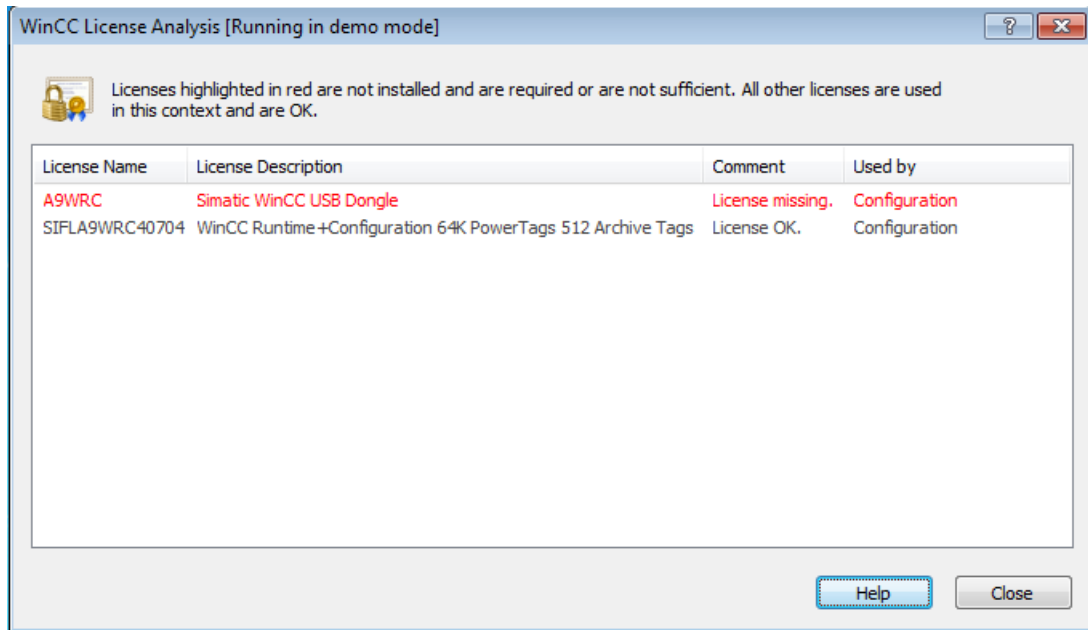
5.7 Diagnostics of Licensing Problems

License Check

If WinCC continues to switch to demo mode even though the licenses have been transferred, WinCC and the Automation License Manager offer a diagnostic function to check the licenses.

How to check the licenses using WinCC License Analysis

1. In the "Siemens Automation" Windows program group, select the entry "License Analysis". WinCC License Analysis opens.



2. The window displays the installed licenses and the required licenses. Required licenses that are not installed or not adequately dimensioned are highlighted in red.

Alternatively, open the license analysis in the Taskbar Notification Area from the shortcut menu of the "SIMATIC WinCC" icon.

How to check the licenses using the Automation License Manager

1. Open the Automation License Manager in the "Siemens Automation" program group.
2. Select the "Management" view in the Automation License Manager.
3. Select the storage location of the license key in the navigation window. The available license keys are displayed.
4. Select the license key to be checked in the table.
5. Select the "Check" option from the shortcut menu. The license is checked and the result of the check is indicated in the table by means of a status icon.

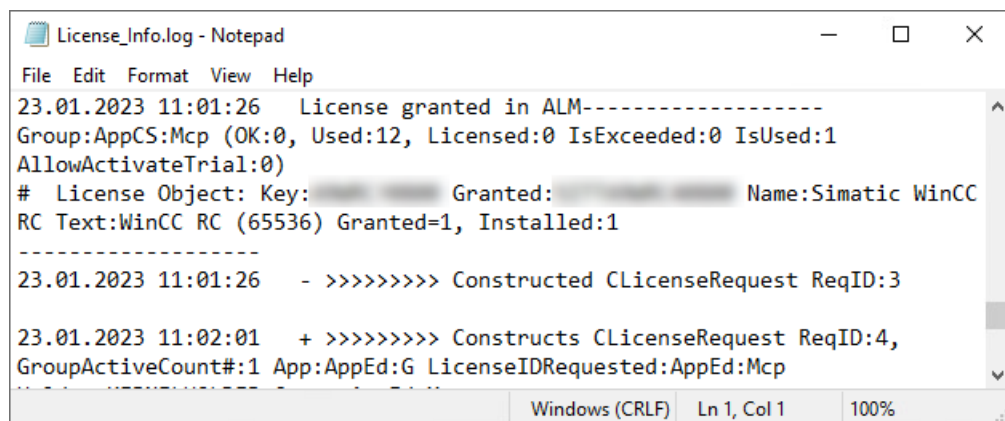
License diagnostics files

The diagnostics files record the licenses called by WinCC:

- License_Info.log
- LicenseLog.xml
- LicenseLog.xsl

If a license is missing, a corresponding entry is shown.

The files are located in the WinCC installation path in the "diagnose" folder. The folder is automatically created when opening WinCC for the first time.



```

License_Info.log - Notepad
File Edit Format View Help
23.01.2023 11:01:26 License granted in ALM-----
Group:AppCS:Mcp (OK:0, Used:12, Licensed:0 IsExceeded:0 IsUsed:1
AllowActivateTrial:0)
# License Object: Key: [REDACTED] Granted: [REDACTED] Name:Simatic WinCC
RC Text:WinCC RC (65536) Granted=1, Installed:1
-----
23.01.2023 11:01:26 - >>>>>>>> Constructed CLicenseRequest ReqID:3

23.01.2023 11:02:01 + >>>>>>>> Constructs CLicenseRequest ReqID:4,
GroupActiveCount#:1 App:AppEd:G LicenseIDRequested:AppEd:Mcp
-----
Windows (CRLF) Ln 1, Col 1 100%

```

Note

Demo mode

If the license for a WinCC option in use is missing, WinCC switches to demo mode.

See also

WinCC in the Demo Mode (Page 252)

5.8 Restore license key

Introduction

A license key is defective if:

- The license on the hard disk can no longer be accessed.
- The key can no longer be found during the transfer to the license data storage medium.

Restore

The license key can be restored through the "Support for License Management".

To contact your local agent for "Automation & Drives", search our contact database on the Internet under:

- <http://www.automation.siemens.com/partner/index.asp> (<http://www.automation.siemens.com/partner/index.asp>)

Required information

If you contact "Support for License Management", have the following information ready:

- Company data (Name, Address, Country, Telephone/Fax...)
- Numerical inquiry code
- With regard to the license data storage medium:
 - Article number of the product (e.g. "6AV...")
 - Product designation in plain text
 - Serial number (license number).

You can find this information on the "Certificate of License" (CoL).

See also

Basic license types and license types in WinCC (Page 249)

Internet: Contact person database (<http://www.automation.siemens.com/partner/index.asp>)

Performance Data

6.1 Performance Data

Contents

This section provides important technical specifications and performance limits for WinCC V8.1.

6.2 Configurations

Quantity structure in a multi-user system

The performance of the WinCC system depends on the employed hardware and the volume of process data.

The following configurations were tested as typical scenarios:

	Quantity	Comment
Server or redundant server pairs	18 servers	WinCC client with its own project: Access to a maximum of 18 WinCC servers or redundant server pairs The mixed configuration of WinCC servers which access other WinCC servers as clients has not been approved.
WinCC clients without their own project	32 Clients ^{1) 2)}	Maximum of 64 WinCC clients without their own project in the WinCC system
WinCC clients with their own project	32 Clients ^{1) 2)}	Maximum of 50 WinCC clients with their own project in the WinCC system
Configuration example 1	32 clients + 3 Web clients	WinCC clients with their own project
Configuration example 2	1 client + 150 Web clients	WinCC client with its own project

1) When the server is also used as an operator station, the number of clients for this server is reduced to four.

You can find additional information in the WinCC Information System under:

- "Configurations > Multi-User Systems > Typical Configurations"
- "Configurations > Multi-User Systems > Quantity Structures and Performance"

2) If multi-VGA is used, the number of WinCC clients may be reduced. In this case also note potential performance limitations caused by the number and complexity of the process pictures.

We recommend limiting the number of monitors to 60, for example, 15 WinCC clients with 4 monitors each.

User Administration

In the User Administrator, you create user groups and users and assign them joint or individual authorizations.

You use predefined standard authorizations and system authorizations and can create your own authorizations.

Object	Maximum number
Authorizations	999
Users	128

Object	Maximum number
User groups	128
Ranges	256

6.3 Graphics System

Configuration

Observe the following restrictions:

- The number and complexity of the objects used affect the performance.
- PDL files larger than 100 MB are not displayed in WinCC Runtime.
- The performance data can be limited by system resources.

	Maximum
Objects per picture	No limit
Levels per picture	32
Pictures (PDL files) per project	No limit
Instances of fixed picture modules in a process picture (Dynamic Wizard)	31 instances of the same type picture
Picture size in pixels	10 000 x 10 000
Nesting levels of picture objects	20
Number of colors	Dependent on graphics card

Runtime

The performance data depends on the hardware implemented.

Process pictures with the following values were tested as typical scenario:

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)	1
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 specified values apply to data from "Tag Logging Fast".

Note

Notes on configuration for WinCC projects

Observe the notes on "Configurations > Multi-User Systems > Quantity Structures and Performance"

6.4 Message system

Configuration

	Maximum
Configurable messages per server/single-user station	150 000
Process tags per message line	10
User text blocks per message line	10
Message classes (incl. system message classes)	18
Message types per message class	16
Message priorities	17 (0...16)

Runtime

The performance data can be limited by system resources.

	Maximum
Messages per message archive	No limit
Messages per short-term archive list	1 000
Messages per long-term archive list	1 000 ¹⁾
Messages per message window	5 000 ²⁾
Continuous message load without loss (single-user station/server)	10/sec
Message surge (single-user station/server)	2 000/10 sec every 5 min ³⁾

1) On single-user station or server or on client, per server or per redundant server pair, if "LongTimeArchiveConsistency" is set to "no". On single-user station, server, client or redundant server pair, if "LongTimeArchiveConsistency" is set to "yes".

2) On single-user station or server or on client, per server or per redundant server pair.

3) If the interval to the next message surge is under five minutes, messages may be lost.

Note

The message overload and continuous message surge can be created simultaneously on a single-user station or server.

Further information can be found in the WinCC Information System under "Working with WinCC > Setting up a Message System > Message Archiving > Message archiving in WinCC".

6.5 Archiving system

Configuration

The following maximum values are recommended for the display of archive values:

	Recommended
Trend window or diagram window per picture	25
Configurable trends per trend window	80
Bar diagrams per diagram 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 station/server ¹⁾	80 000

1) Dependent on number of licensed archive tags (ArchivTags).

Note

In cases of a combination of the maximum values, high picture selection times can occur.

Runtime

The archiving performance is influenced by multiple factors, for example:

- Number of values that are archived with Tag Logging Fast and Tag Logging Slow. *)
If necessary, reduce the archived values of the databases.
- Signing of data
The archive signing, segment sizes as well as frequent segment changes can impact the performance.
- Data sources used, which means the type and number of controllers / CPUs, OPC servers, etc.
If necessary, check the performance of the data sources.
- System configuration of the servers, which means operating system, drive type, work memory, etc.

*) Tag Logging Fast: Archive tags with archiving cycles < 1 minute; Tag Logging Slow: Archive tags with archiving cycles > 1 minute.

Example configurations

The following configurations were tested as typical scenarios:

Mean value: Archive tags / second ^{1) 2)}		Archiving cycle: Distribution of archive tags		
		500 ms	1 s	2 s
Small configuration: Single station system	2500	500	1000	1000
Medium configuration: Server-client system	15000	2500	5000	10000
Large configuration: Distributed system with redundant server	30000	5000	10000	20000

1) The performance tag "@PRF_TLGR_T_AVERAGE_TAGS_PER_SECOND" provides the average number of archived tags/second.

2) System load through process picture display: Approximately 5% - 10% of the archive values are displayed in WinCC OnlineTrendControls and WinCC OnlineTableControls.

Hardware used

The following hardware was used in the example configurations:

Configuration	Server / single-user PC ¹⁾	IPC	Data source
Small	Standard PC: Intel i5, 8 GB, standard HDD	IPC347E	1 controller, e.g. CPU S7-1516
Medium	Small server: Intel i7, 16 GB, SSD	IPC847D, IPC547G	2 to 10 controllers, e.g. CPU S7-1516, S7-1517
Large	Large server: Intel Xeon, 32 GB, Raid system, SSD	IPC847D	More than 10 controllers, e.g. CPU S7-1517, S7-1518

1) A major factor is the performance and write speed of the hard disk.

Performance tags

The "@PRF_..." system tags provide values regarding the performance when reading, writing and archiving tags.

You can find additional information in the WinCC Information System under "Working with WinCC > Working with Projects > Making Settings for Runtime > System Diagnostics with Performance Tags"

6.6 User archives

Configuration

The performance data can be limited by system resources.

The fields of the user archives are mapped as columns in the WinCC Configuration Studio.

	Maximum
Total archives	No limit
User archive fields ¹⁾	500
Data records per user archive	10 000
User archive views	No limit

1) Maximum 1 000 000 fields total.

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

Configuration of the user archives in the WinCC project used:

- One WinCC tag per field
- 1 000 000 entries each:
 - 100 fields with 10 000 data records.
 - 500 fields with 2 000 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 (Report Designer)

Configuration

The performance data can be limited by system resources.

	Maximum
Configurable reports	No limit
Report lines per group	66
Tags per report ¹⁾	300

1) The number of tags per report is dependent on the performance of the process communication.

Runtime

	Maximum
Simultaneously running message sequence reports per server/client	1
Simultaneously running message archive reports	3

6.8 Scripting with VBS and ANSI-C

Runtime

The performance data can also be influenced by the following factors:

- Hardware used
- Type of configuration
- Running processes, for example, Tag Logging or Alarm Logging

The following measured values indicate the difference between VB scripting and C scripting based on the comparison of orientation values.

The following configuration was tested as typical scenario:

Typical configuration

For example: Windows 7 (64-bit), Intel Core i7-2600 (3.4 GHz), 8 GB RAM

The measured values are specified in milliseconds.

	VBS	ANSI-C
Set color of 1 000 rectangles	220	1 900
Set output value of 200 I/O fields	60	170
Select a picture with 1 000 static texts which determine the object name and issue it as 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

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;
}
```

6.9 Process Communication

Introduction

The following table provides information on the possible configurations and maximum number of connections.

Note

System configuration and performance

The limit values listed in the table are also dependent on the performance capability of your system and the configuration limits of the WinCC project (e.g. number of process values/time unit).

You use the WinCC performance tags to analyze the time behavior of the server and the communication channels.

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 S7-1200 ⁶⁾	128 ⁵⁾	---	---	---	---
SIMATIC S7-1500 ⁶⁾	128 ⁵⁾	---	---	---	---
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

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 505 Serial					
• NTP / 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 DP (V0-Master)					
• DP 1	---	---	122	---	---
• DP 2	---	---	122	---	---
• DP 3	---	---	122	---	---
• DP 4	---	---	122	---	---
Allen Bradley - Ethernet IP					
• CAMP ⁷⁾	--- ⁵⁾	---	---	---	---
Mitsubishi Ethernet					
• MELSEC Communication Protocol (MC protocol)	--- ⁵⁾	---	---	---	---
Modbus TCP/IP					
• Modbus TCP/IP	--- ⁵⁾	---	---	---	---
OPC					
• Data Access	--- ⁵⁾	---	---	---	---
• XML-DA	--- ⁵⁾	---	---	---	---
OPC Unified Architecture					
• Data Access	--- ⁵⁾	---	---	---	---
SIMOTION					
• CP1613	---	---	---	---	60
• CP1623	---	---	---	---	120
• CP1628	---	---	---	---	510
• Standard Ethernet connection	---	---	---	120/510 ⁸⁾	---

Remarks

1) In principle, all communication channels can be combined with each other. However, the subordinate communication drivers can lead to constraints.

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 takes place via the standard Ethernet port of the computer or corresponding Siemens communications processors.

The maximum possible number of connections is limited by the available system resources and their performance data, particularly CPU, RAM, Ethernet connection.

6) Note the maximum number of WinCC systems (see table: "SIMATIC S7-1200, S7-1500 Channel" channel).

7) CAMP = Common ASCII Message Protocol

8) The SIMOTION channel for WinCC V7.x/V8.x supports five channel units for configuring connections to SIMOTION or SINAMICS controllers via SIMATIC NET:

- SIMOTION:
TCP/IP via Soft-Net
- SIMOTION CP1, SIMOTION CP2, SIMOTION CP3, SIMOTION CP4:
TCP/IP via CP1613, CP1623 or CP1628

The channel does not limit the number of connections via the individual channel units.

However, the following limitations apply when SIMATIC NET is used:

- Soft-Net S7: max. 120 connections
- Soft-Net S7 Advanced: max. 510 connections
- CP1613: max. 60 connections per CP
- CP1623: max. 120 connections per CP
- CP1628: max. 510 connections per CP

If multiple connections are configured to the same IP address, these only count as one single connection (exception: CP1613).

The limitation affects the sum of connections via SIMATIC NET Soft-Net or a CP.

All connections of the following channel DLLs via Soft-Net or the same CP count here:

- Simotion
- Simatic S7 Protocol Suite
- Simatic S7-1200, S7-1500 Channel
- Simatic S5 Ethernet Layer 4
- Simatic TI Ethernet Layer 4

"SIMATIC S7-1200, S7-1500 Channel" channel

Maximum number of WinCC systems per CPU:

CPU "S7-12xx"	Number	CPU "S7-15xx"	Number
S7-12xx V2.2	1	S7-1511	15
S7-12xx V3	3	S7-1513	23
S7-12xx V4	4	S7-1515	29
-	-	S7-1516	36
-	-	S7-1517	105
-	-	S7-1518	126

Maximum number of tags in Runtime

The maximum number of tags that are simultaneously being used in the connection must not be exceeded permanently.

You can read off the number of tags used in Runtime in the WinCC Channel Diagnosis under "Plc Attributes (free/max)". If several HMI devices access a controller, this value applies to all HMI devices together.

Diagnostics

7.1 Overview: Diagnostics in WinCC

SIMATIC WinCC V8 supports you in many ways in the monitoring and diagnosing of your systems and plants.

This overview lists the different diagnostics possibilities and references the corresponding documentation in SiePortal on the internet or in the WinCC Information System.

Local storage: WinCC diagnostics files

On WinCC systems, most diagnostics files and log files are located in the following path:

- <Installation path>\WinCC\diagnose
Example: "C:\Program Files (x86)\Siemens\WinCC\diagnose"

If applicable, the corresponding documentation contains information on additional storage paths.

Application examples and FAQs

The following examples from the SiePortal support you with your system configuration and diagnostics:

- SiePortal: Requirements in a Windows network for operating SIMATIC WinCC (entry ID: 868014) (<https://support.industry.siemens.com/cs/ww/en/view/868014>)
- SiePortal: Installation and operation of WinCC in a Microsoft domain environment (entry ID: 78346833) (<https://support.industry.siemens.com/cs/ww/en/view/78346833>)
- SiePortal: Diagnostics of WinCC V7 (entry ID: 109757865) (<https://support.industry.siemens.com/cs/ww/en/view/109757865>)
- SiePortal: Redundancy in WinCC V7.x and WinCC Professional (entry ID: 109772627) (<https://support.industry.siemens.com/cs/ww/en/view/109772627>)
- SiePortal: Configuration of a client-server system with WinCC V7.5 (entry ID: 109771695) (<https://support.industry.siemens.com/cs/ww/en/view/109771695>)

Plant monitoring

- **SIMATIC ProDiag (S7-1500)**
Process diagnostics and system diagnostics in the TIA Portal for S7-1500 controllers
 - Diagnostics > ProDiag – Plant monitoring in WinCC (Page 311)
 - SiePortal: ProDiag for SIMATIC STEP 7 Basic/Professional – Documentation (<https://sieportal.siemens.com/en-ww/search?scope=knowledgebase&SearchTerm=prodiag%20SIMATIC%20STEP%207&SortingOption=CreationDateDesc&EntryTypes=Manual&Page=0&PageSize=20&ProductNodePath=%2F13613%2F24841%2F14666%2F14667%2F14672%2F>)
- **SIMATIC WinCC/ProAgent (S7-300 / S7-400)**
Plant-specific process diagnostics for detecting and eliminating errors
 - Diagnostics > WinCC/ProAgent (available if this option is installed)
 - SiePortal: SIMATIC WinCC/ProAgent – Documentation (<https://sieportal.siemens.com/en-ww/search?scope=knowledgebase&SearchTerm=wincc%20proagent&SortingOption=DefaultRankingDesc&EntryTypes=Manual&Page=0&PageSize=20&ProductNodePath=%2F13613%2F14729%2F14855%2F14866%2F14867%2F>)
- **Diagnostic support in integrated projects**
Network entry jump and entry jump into hardware diagnostics in STEP 7 Runtime
 - Working with WinCC > Integration of WinCC into SIMATIC Manager > Diagnostic support

System and project monitoring

- **Simatic Shell: Project status and connection status**
 - Working with WinCC > Working with projects > Annex > WinCC status and control in the tray area
 - Configurations > Distributed systems > Remote configuration
 - Configurations > Redundant Systems > Configuring the redundant system > How to configure redundant servers
- **Lifebeat monitoring**
Monitoring of server and client computers as well as connected automation devices
 - Options > Options for Process Control > Lifebeat Monitoring
- **Status analysis of time synchronization**
 - Options > Options for Process Control > Time Synchronization > System tags for status analysis of time synchronization
- **Configuring the network card**
 - Configurations > Distributed systems > System behavior in Runtime > Special features of communication using a server with multiple network cards

Creating and managing WinCC projects

- **Support in migrating projects**
 - Migration > Migration diagnostics
- **Recommendations for improving performance in Runtime:**
 - Working with WinCC > Configuration recommendations > Configuration recommendations
- **Diagnosing load online changes**
 - Working with WinCC > Working with projects > Creating and editing a project > Load online changes
- **Diagnostics during import in WinCC Configuration Studio**
 - Working with WinCC > Working with projects > WinCC Configuration Studio > Importing data records

Scripting (VBS, ANSI-C, VBA)

- **VBScript**

GSC diagnostics and diagnostics with the script debugger

 - Working with WinCC > VBS for Creating Procedures and Actions:
 - Diagnostics
 - VBS reference > Appendix > Error messages from the database area
 - VBS reference > Properties > E > ErrorDescription property
- **Global Script / ANSI-C**

GSC diagnostics with printf instructions and analysis via diagnostic tags

 - Working with WinCC > ANSI-C for Creating Functions and Actions:
 - Runtime behavior of actions > GSC diagnostics
 - ANSI-C function descriptions > Internal functions > WinCC > FillDiagnoseInTags
- **VBA: Script Analysis**

Check the syntax of C scripts or VB scripts using the CheckSyntax method

 - Working with WinCC > VBA for automated configuration > VBA reference > Object model of the Graphics Designer > Methods > A-C > CheckSyntax method
- **Runtime monitoring of actions with APDiag**
 - Diagnostics > Diagnostics of WinCC with APDiag (Page 283)

WinCC Runtime

- **System tags for performance analysis**
 - Working with WinCC > Working with Projects > Making Settings for Runtime:
 - System diagnostics with performance tags
 - Overview of performance tags
- **Additional system tags for monitoring WinCC functions**
 - Working with WinCC > Working with tags > Basics of tag management > Tags > System tags

- **Displaying information on the tag status in Runtime**
 - Working with WinCC > Working with tags > Basics of tag management > Displaying status information in Runtime
- **WinCC system events**
 - Working with WinCC > Setting up a message system > Configuring the alarm system > Working with system events > Description of WinCC system events
 - Options > Options for process control > OS Project Editor > Overview of process control messages
- **License status and licensing information**
 - Licensing > Diagnostics for licensing problems
 - Licensing > WinCC in demo mode
 - Working with WinCC > Working with projects > Appendix > WinCC diagnostics window and licensing information
 - WinCC/WebNavigator documentation > Operating a WinCC project > Diagnosing connections with "Status.html"

Communication

- **Performance tags and status tags for monitoring connections and process tags**
 - Communication > Communication diagnostics > Channel diagnostics:
 - Checking the connection with performance tags
 - How to check a channel using the "Status Logical Connections" function
- **Status of the server and client connections**
 - Working with WinCC > Working with projects > The WinCC Explorer > Menu bar of the WinCC Explorer
- **"Channel diagnostics" for diagnosing channels**
 - Communication > Communication diagnostics > Channel diagnostics > Diagnosing channels with channel diagnostics

- **Individual WinCC communication channels diagnostics and protocols:**
 - System Info
 - SIMATIC S7-1200/S7-1500
 - SIMATIC S7 Protocol Suite
 - SIMATIC S5 Profibus FDL
 - OPC client
 - OPC Server
 - OPC UA: Trace functions
 - Cloud connection
 - WinCC REST service
- More information:
 - Communication > Communication diagnostics
 - Interfaces > OPC - Open Connectivity > Diagnostics
 - Interfaces > WinCC/Cloud Connector > Cloud connection diagnostics
 - Interfaces > REST interface in WinCC
- **WinCC Controls for communication monitoring and analysis in process pictures**
 - Working with WinCC > Creating process pictures > Working with controls > ActiveX controls:
 - WinCC Channel Diagnosis
 - WinCC SysDiagControl

Redundant systems

- **WinCC Redundancy system tags**
 - Configurations > Redundant systems > Scenarios for WinCC Redundancy > WinCC Redundancy system variables
 - **WinCC Redundancy system messages**
 - Configurations > Redundant systems > Scenarios for WinCC Redundancy > WinCC Redundancy system messages
 - **"RedundancyControl" diagnostic tool**

The "RedundancyControl" is located on WinCC systems in the following path:

 - C:\Program Files (x86)\Common Files\Siemens\lce\bin
- More information:
- SiePortal: Redundancy in WinCC V7.x and WinCC Professional (entry ID: 109772627) (<https://support.industry.siemens.com/cs/ww/en/view/109772627>)

WinCC/WebNavigator / WinCC/WebUX

- **Connection status and release of licenses**
 - WinCC/WebNavigator documentation > Operating a WinCC project > Diagnosing Connections with "Status.html"
- **Overview of possible errors and information on troubleshooting**
 - WinCC/WebNavigator documentation > Appendix > Troubleshooting
- **Script diagnostics with "PdIPad"**
 - Configuring WinCC/WebNavigator documentation > Configuring WebNavigator system > Configuring the WinCC project > Publishing WinCC process pictures > How to publish WinCC process pictures with the WinCC Web Publishing wizard

7.2 APDiag - WinCC diagnostics

7.2.1 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 sound knowledge of the system architecture is required to understand it. 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.

7.2.2 Starting ApDiag.exe

Start ApDiag

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



apdiag.exe

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.

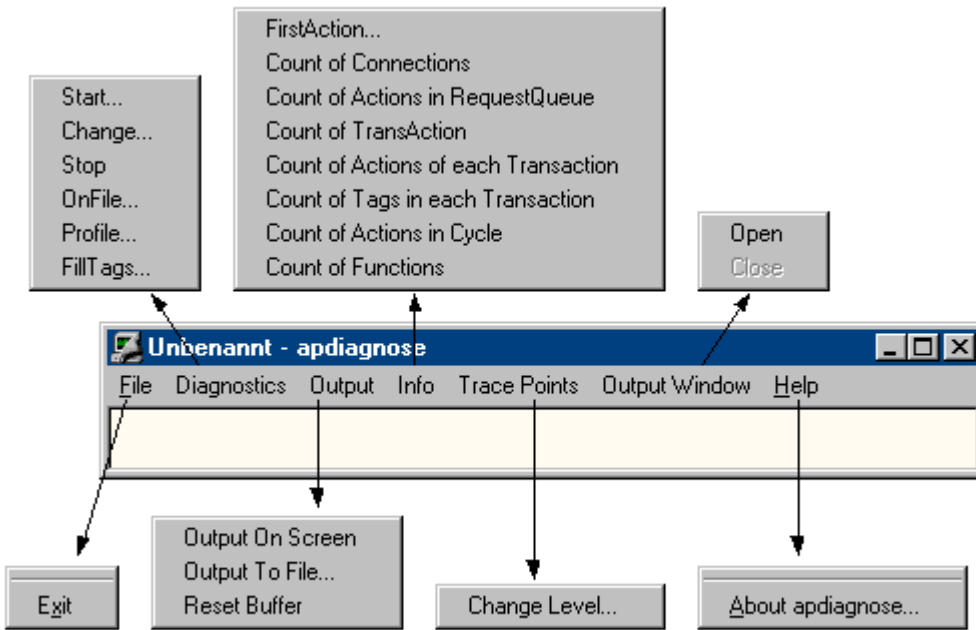
7.2.3 ApDiag Menu Commands

7.2.3.1 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.

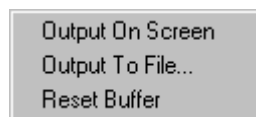
Menu command "OnFile" can be used for defining the output source for the individual types of diagnostics information.

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

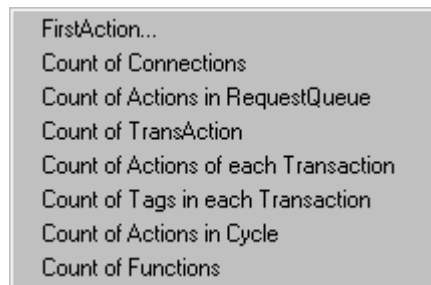
Using menu "Output", trace entries generated with diagnostics can be output to a window, stored in a file or deleted.



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.

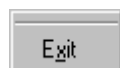


The diagnostic information is output one time when selected (not automatically). The output is done as trace (Level1) and as printf.

7.2.3.2 File - Exit

Description

Use command "Exit" to end ApDiag.

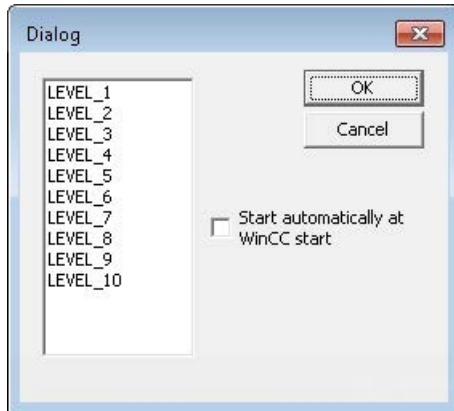


7.2.3.3 Diagnostics

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**

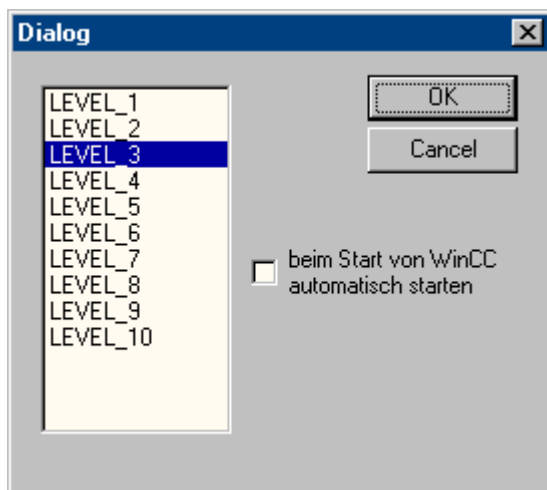
This setting is also retained after ending ApDiag.exe and after restarting the computer.

See also

Trace points and their diagnostics level (Page 306)

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.

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.

OnFile

Description

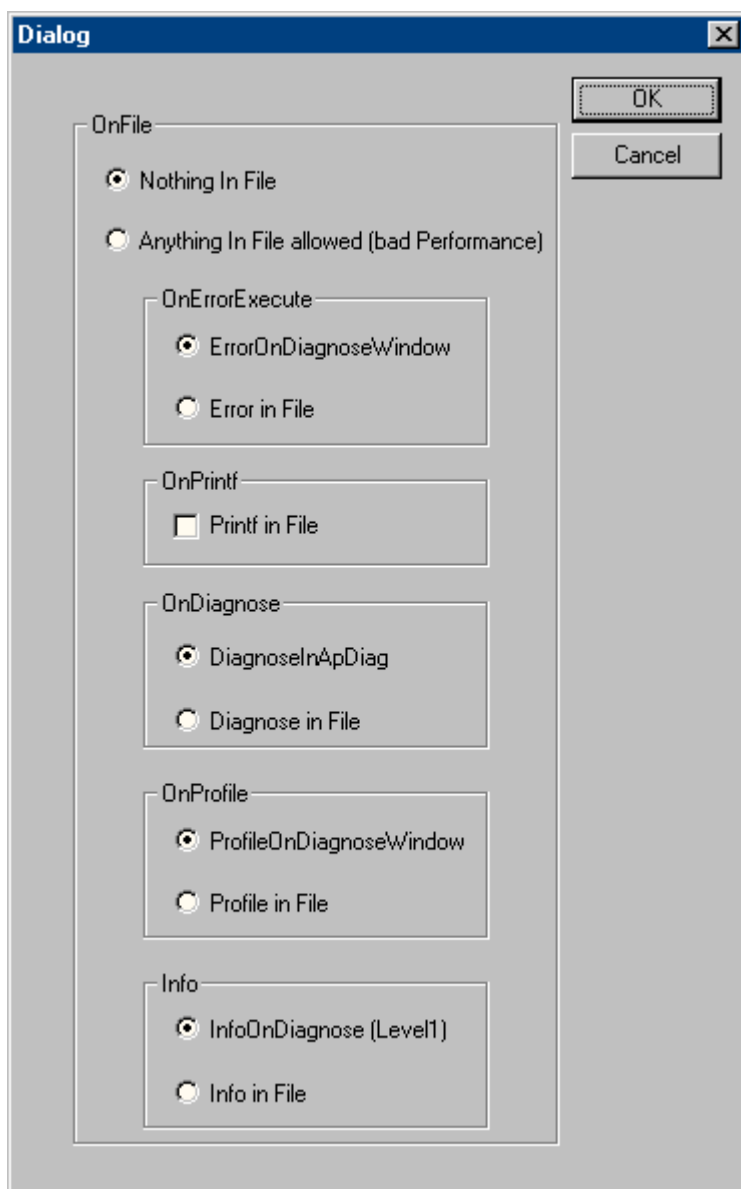
Dialog "OnFile" can be used to convert diagnostics information (e.g. OnErrorExecute, printf) into a text file. All settings are stored in the registry and are retained after a restart as well.

Number of diagnostics files

Up to ten "OnError<x>.txt" files are created by default. To create more files, change the value in the standard function "OnErrorExecute".

Prevent writing to file

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 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 OnError<x>.txt and is located in the installation directory:

- ..\Siemens\WinCC\Diagnose

Write to files

A certain number of entries is written to a file. Then the next file is begun.

It is always started with OnError0. After file OnError9, 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.

Change maximum number of files

To create more than ten "OnError<x>" files, open the standard function OnErrorExecute and change the maximum number of files in line 67:

```
if (dwFileCount > 10)
```

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 Onprintf9, it begins with Onprintf0 again. After activation, it is also started with Onprintf0 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 OnDiagnose9 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 OnDiagnose9 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 OnInfo9 it begins with OnInfo0 again. After activation, it is also started with OnInfo0 the first time the function is called.

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.

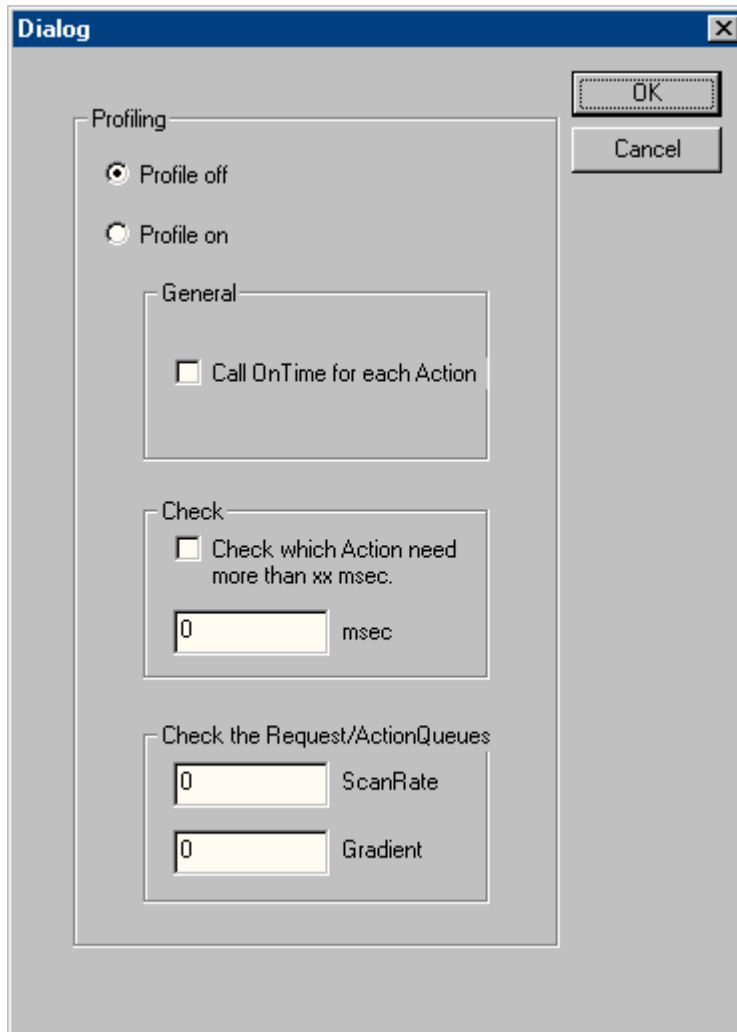
General Information on Queue Overflow

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

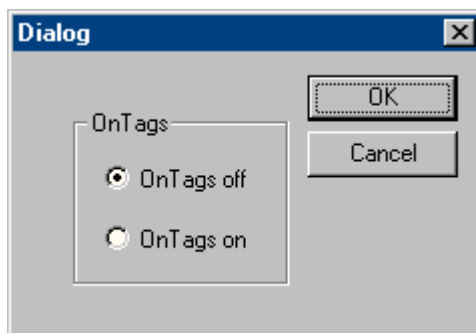
See also

FillTags (Page 294)

FillTags

Description

You can use the "FillTags" menu command to activate the storing of important diagnostic values in tags.



The diagnostic tags are created during the creation of a WinCC project. You can work with the tags as with other internal tags.

Activation and deactivation is also possible with the internal function "FillDiagnoseInTags()".
More information:

- "Working with WinCC > ANSI-C for creating functions and actions > ANSI-C function descriptions > Internal functions > WinCC > FillDiagnoseInTags"

Note

Performance restriction

Writing diagnostic values generates additional base load.

The runtime for each started action is lengthened since the diagnostics values also have to be written in the tags.

Therefore, only activate this function briefly for diagnostic purposes.

WinCC Diagnostics tags

@SCRIPT_COUNT_TAGS	This tag contains the current number of tags requested via script.
@SCRIPT_COUNT_REQUESTS_IN_QUEUES	This tag contains the current number of scripts waiting for processing in the queue. A maximum of 10 000 entries can be pending in the queue.
@SCRIPT_COUNT_ACTIONS_IN_QUEUES	This tag contains the current number of actions waiting for processing in the queue. When Runtime is deactivated, the tag retains the last saved value. After reactivating Runtime, this tag value is displayed as the start value. The tag value is only reset when the WinCC project is closed. A maximum of 10 000 entries can be pending in the queue.

See also

Profile (Page 291)

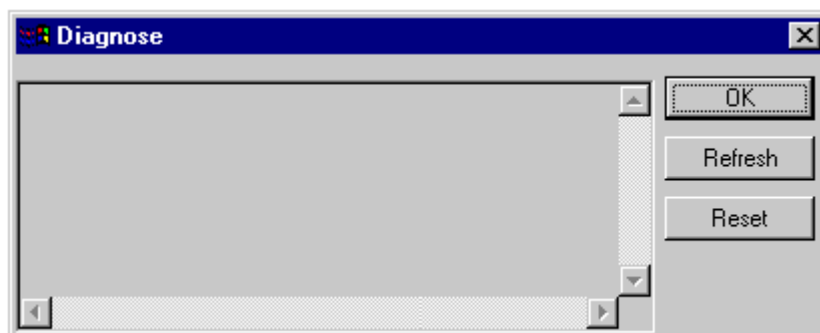
7.2.3.4 Output

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.

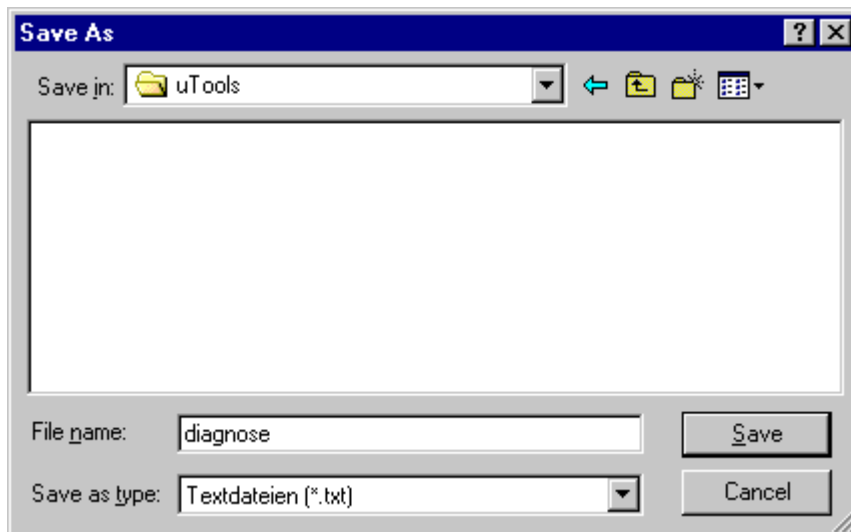


Note**Sequence in the Diagnostics Buffer**

The diagnostics buffer is a circulating buffer. The lowest entry is therefore not necessarily the oldest entry.

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.

**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.

7.2.3.5 Info

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

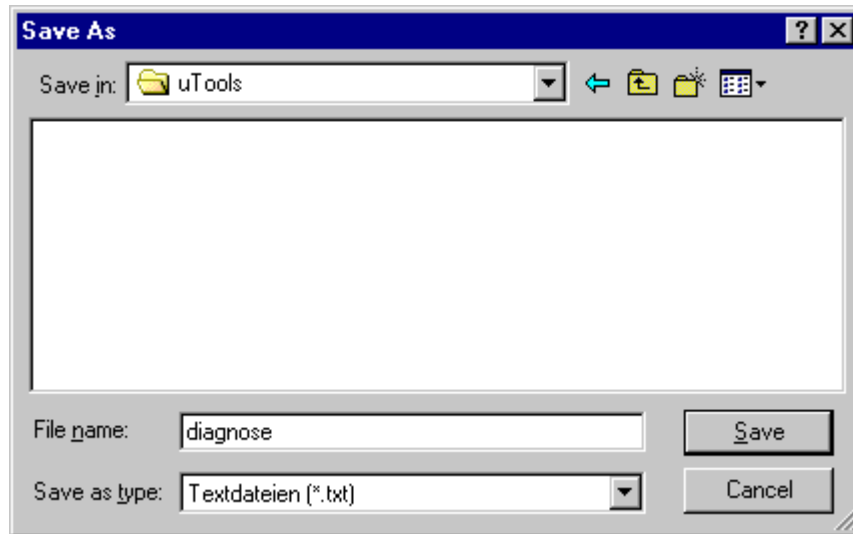
A "blocking" action can be simulated using the `MessageBox(NULL, "Welt", "Hallo", MB_OK);` function.

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()`.

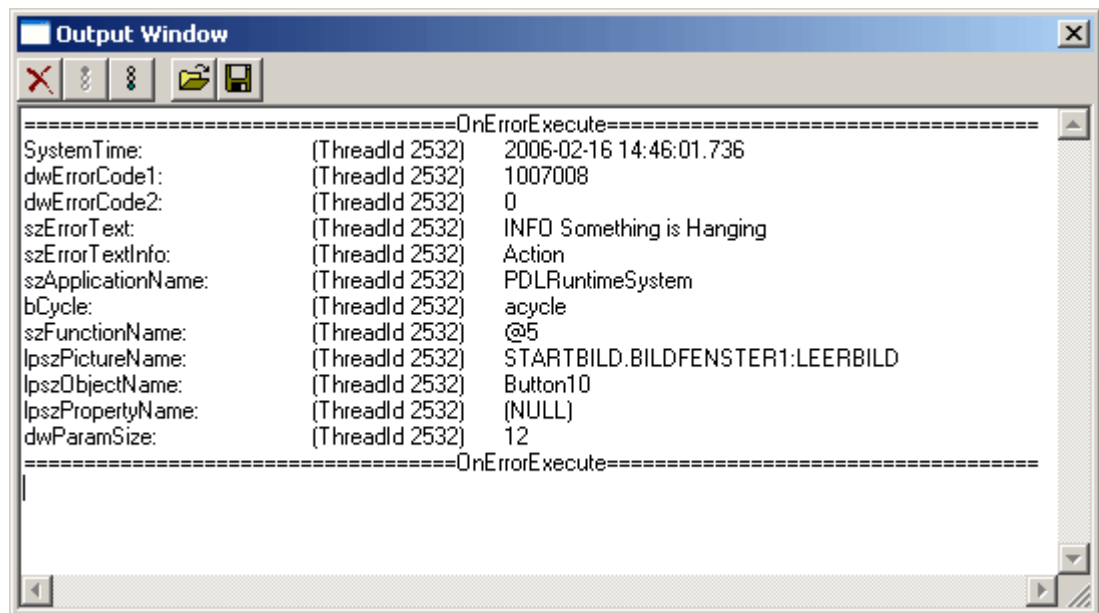


To check whether an action is blocking processing:

1. Start ...Siemens\WinCC\Tools\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:

```

stack.txt - Editor
Datei Bearbeiten Format Ansicht ?
=====Doku to Action=====
Info: The following Request is hanging.
Type of Request: Action
szApplicationName: PDLRuntimeSystem
acycle
szFunctionName: @5
szName1: STARTBILD.BILDFENSTER1:LEERBILD
szName2: Button10
szName3:
dwParamSize: 12
=====Doku to Action=====
//
// Call stack:
//-----
// Address | Frame |
//-----
// 7C94ED54 | 0312F410 | KiFastSystemCallRet+0
// 77E2F122 | 0312F438 | DefDlgProcW+5FC
// 77E41722 | 0312F6F8 | SoftModalMessageBox+6FB
// 77E41004 | 0312F848 | AppendMenuA+1F4
// 77E51A28 | 0312F8A0 | MessageBoxTimeoutW+5B
// 77E75E47 | 0312F8D4 | MessageBoxTimeoutA+A1
// 77E5DD8B | 0312F8F4 | MessageBoxExA+1B
// 77E5D923 | 0312F910 | MessageBoxA+45
// 00316860 | 0312F98C | CissDeleteModuleEx+11A0
// 0031132E | 0312FA34 | 0001:0000032E C:\Programme\Siemens\winCC\bin\CISS62.dll
// 0032C5FE | 0312FACC | CissGetLastError+199E
// 00347798 | 0312FB48 | fileno+4988
// 00323DD8 | 0312FB98 | CissExecuteFunctionEx+88
// 00313083 | 0312FBD4 | CissExecuteFunction+53
// 10002309 | 0312FE7C | 0001:00001309 C:\Programme\Siemens\winCC\bin\AKTSTEU.dll
// 10001C4B | 0312FEC0 | 0001:00000C4B C:\Programme\Siemens\winCC\bin\AKTSTEU.dll
// 10006621 | 0312FF14 | CapSteu::CApSteu+1571
// 73DC22CB | 0312FF84 | ordinal1184+15B
// 77B9B530 | 0312FFB8 | endthreadex+A3
// 7C826063 | 0312FFEC | GetModuleFileNameA+EB

```

Note**"MB_SYSTEMMODAL" parameter**

Execution of a message box function with parameter "MB_SYSTEMMODAL" ensures that the message box is displayed in the foreground. If this parameter is not specified, the message box is hidden to users and (in the background) and cannot be operated. Mouse click events outside the message box are written to a buffer and processed after you exit the message box.

Example: `MessageBox(NULL, "Welt", "Hallo", MB_SYSTEMMODAL | MB_OK);`

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
=====
```

Count of Actions in RequestQueue

Description

Menu command "Count of Actions in RequestQueue" outputs the current number of actions that are queued for processing.

Jobs from Global Script, cycle jobs from pictures, and event-controlled jobs from pictures are differentiated.

A maximum of 10 000 entries can be pending in the queue.

Example

```
=====
Applikation: GSC_RT cycle Count of Requests 0
Applikation: PDLRuntimeSystem cycle Count of Requests 0
Applikation: PDLRuntimeSystem acycle Count of Requests 1
=====
```

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
=====
```

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 Transaktionen: 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 Transaktionen: Count of Action in Transaction 40

=====

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 Transaktionen: 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 Transaktionen: Count of Tags in Transaction 8

=====

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

=====

Count of Functions

Description

Menu command "Count of Functions" provides the number of standard functions and project functions and lists the functions by name.

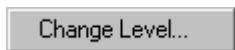
Example

```
=====
Count of Functions 112
FunctionName UTC PathName \
\SERVER1\WinCC50_Project_GSLasttest\library\UTC.Fct
FunctionName WriteNow PathName \
\SERVER1\WinCC50_Project_GSLasttest\library\WriteNow.Fct
=====
```

7.2.3.6 Trace Points - Change Level

Description

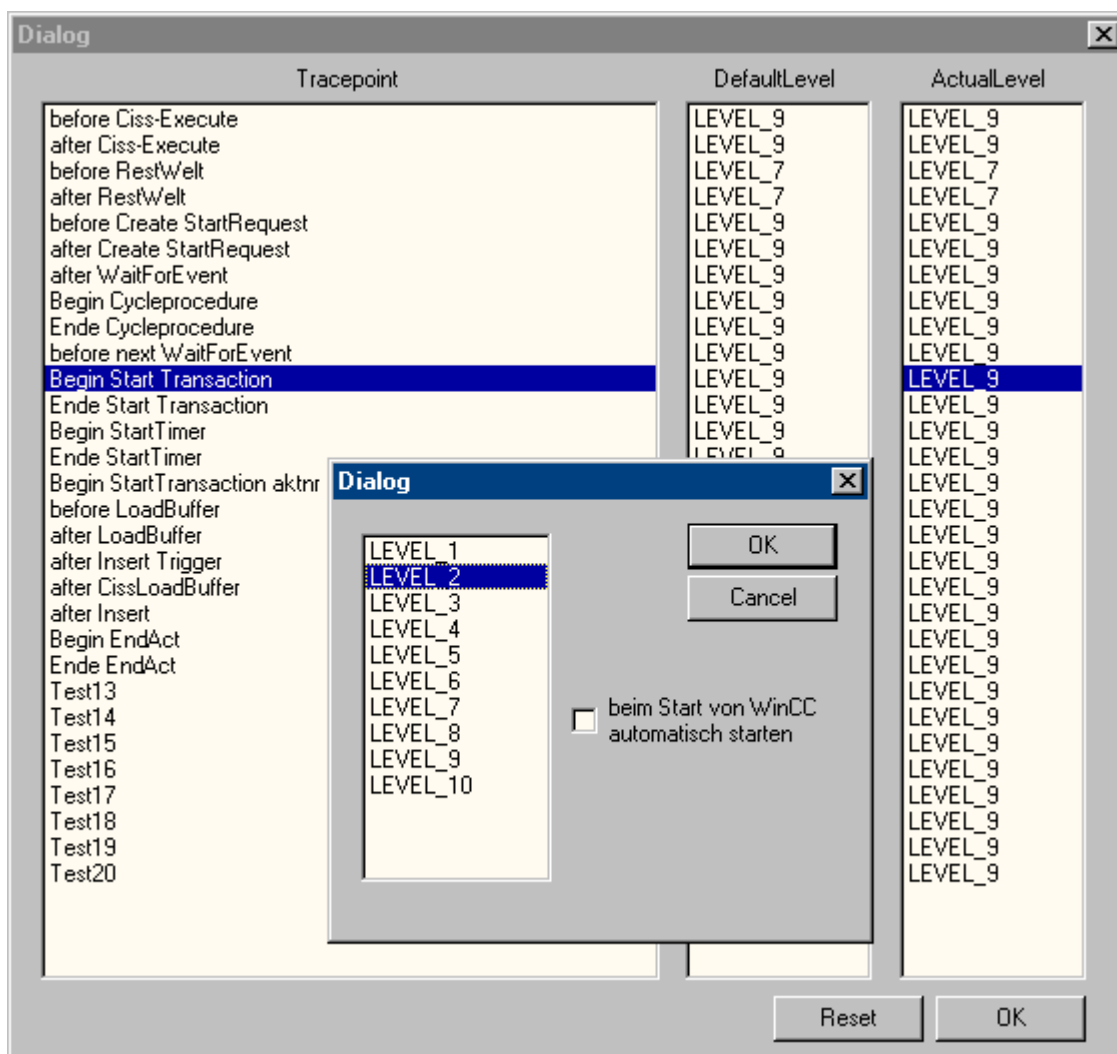
The levels of certain trace points can be changed with this menu command.



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.



7.2.3.7 Output Window - Open / Close

Description

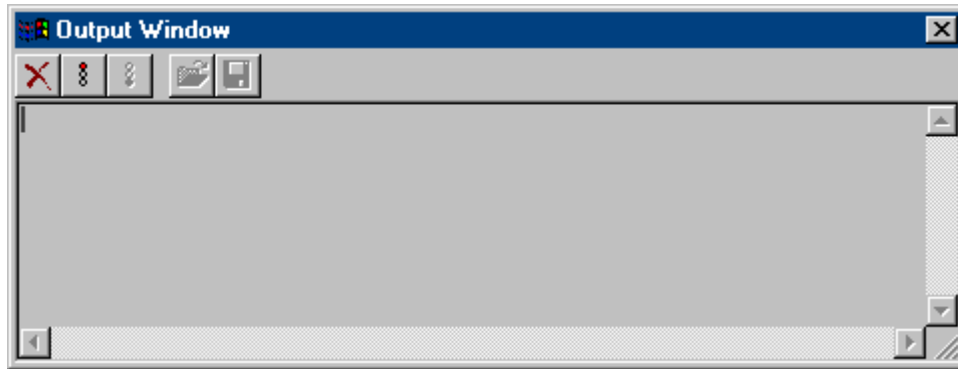
Opens or closes the output window.



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.



7.2.4 Appendix

7.2.4.1 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
m_szIncludepathProj:	6	Project path for a compiler include

Trace point	Level	Description
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.

See also

Start (Page 286)

7.2.4.2 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	Overflow	ActionOverflow: more than 10000 Actions to work	Overflow, more than 10000 actions in the queue.
1007001	3	Action error	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	Action error	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	Overflow	DM_queue overflow	Overflow of an internal list.

Number	Type	Short description in Alarm Logging	Text in diagnosis	Description
1007003	2	Connection error	no connection to server %s (Servername)	The connection to the server is broken. Measure: Start server again.
1007004	3	Action error 1	Function %s (Functionsname) unknown	Unknown function.
1007004	3	Action error 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	Action error 2	no PCode	A Global Script action or a function contains no executable code (P-Code). Measures: Compile action or function.
1007005	3	Action error 2	Error in FunctionName	The function name is incorrect.
1007005	3	Action error 2	wrong Return Type	The Return value type is invalid.
1007005	3	Action error 2	Fault in LoadAction	Compiler error when loading the action.
1007005	3	Action error 2	Fault in OpenFunktion %s (Dateiname der Funktion)	A function could not be loaded.
1007005	3	Action error 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	Action error 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	Action error 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	Tag error	Variable %s not exist	Requested tag does not exist.
1007006	3	Tag error	Variable %s timeout	Tag request was not answered within a certain amount of time.
1007006	2	Tag error	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.

Number	Type	Short description in Alarm Logging	Text in diagnosis	Description
1007007	1	Info	Alles vorbei INVALID_HAN-DLE_VALUE GetLastError() %d	The second access attempt failed. The SCRIPTFACT directory and the functions and header files contained within are not available. Possible causes: Network is faulty, no current Service-Pack 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	Action error 2	Deactivation : Action was stopped by script	An action was still running 50 s after ending runtime and was deactivated.
1007008	3	Action error 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	Error in thread	Thread said good-bye	A job thread has ended unexpectedly.
1007009	3	Error in thread	APDMConnect-Thread said good-bye	The thread that prepares the connection between the script control, tag management and other applications was ended unexpectedly.

7.3 ProDiag - Plant monitoring in WinCC

7.3.1 Basics of supervision with ProDiag

Introduction

ProDiag is used to monitor and identify errors that occur in the plant or machine. You can use ProDiag to show the type of error, the cause of the error and the location of the error on the HMI device.

Use

You use ProDiag functions to monitor your plant and visualize it in Runtime. The main objective of ProDiag is to reduce downtimes and production failures after an error occurs and to prevent errors through early warnings. Diagnostics and display objects supply targeted information for the operator during troubleshooting.

Principle

In STEP 7, you create operand supervisions and configure the settings according to your requirements. When an error occurs, a supervision alarm is generated based on the criteria you have configured. The configured supervision instances are stored in the preset ProDiag function block. You can use the automatically generated ProDiag FBs or create and configure your own ProDiag FBs.

With WinCC, you visualize the ProDiag functions for display on an HMI device. You configure the screen objects which provide an overview of the current status of the plant and display the affected code or the step sequence when an error occurs.

7.3.2 Controls for monitoring with ProDiag

A distinction is made between two types of diagnostics:

- System diagnostics (< 5% of all error cases)
Detection, signaling and evaluation of errors within the automation system (e.g. wire break, module failure, program error, etc.)
- Process diagnostics (> 95% of all error cases)
The purpose of process diagnostics is to gather information on the type, location and cause of an error and to provide information on troubleshooting (e.g. motion disturbed, interlock not fulfilled, pressure too high, end position exited impermissibly, etc.).

Main goal of system diagnostics and process diagnostics:

- Reduction of downtimes and production outages after an error occurs, or prevention through early warnings and notices.
- Facilitation of troubleshooting or maintenance work through targeted instructions for the machine operator.

You can find a detailed description of the configuration of monitoring in the STEP 7 documentation.

You can find more information in the "SIMATIC STEP 7 Basic/Professional V18 and SIMATIC WinCC V18" documentation:

- SiePortal: "STEP 7 and WinCC Engineering V18 > Programming PLC > Monitoring machines and systems with ProDiag" (<https://support.industry.siemens.com/cs/ww/en/view/109815056/159080042635>)

ProDiag Controls

The Graphics Designer offers the following ProDiag controls when creating pictures:

ProDiag overview (WinCC ProDiagOverviewControl)	Overview of the monitoring at Runtime and gathering of diagnostic information if an error occurs.
ProDiag overview (WinCC ProDiagOverviewControl)	Shows the current program status for executed steps of the GRAPH sequencer. Errors during execution of a program are shown directly in the corresponding step.
PLC code view (WinCC PlcCodeViewerControl)	Shows the GRAPH sequence with "Status" of the steps and the assignment list of the utilized operands.
PLC code view (WinCC PlcCodeViewerControl)	Shows the operands in the user program that contain errors and have triggered a selected alarm. In addition to the alarm, the list of operands with errors is shown in the same picture.

You can find the ProDiag Controls in the "Controls" palette > "Controls" selection window > "Prodiag Controls" node.

General procedure in runtime

1. The ProDiag overview (WinCC ProDiagOverviewControl) and GRAPH overview (WinCC GraphOverviewControl) controls call attention to errors in the sequence.
2. Click the alarm button to jump to the message in the alarm view.
3. To see details on an error, display the PLC code view control (WinCC PlcCodeViewerControl).
4. The Criteria analysis control (WinCC CriteriaAnalysisControl) allows you to analyze errors in the PLC user program.

See also

SiePortal: "STEP 7 and WinCC Engineering V18 > Programming PLC > Monitoring machines and systems with ProDiag" (<https://support.industry.siemens.com/cs/ww/en/view/109815056/159080042635>)

7.3.3 Configuring supervisions

Introduction

In WinCC, you configure ProDiag supervisions in your user program in STEP 7 and the visualization for the HMI devices in WinCC.

Requirements

- A connection to an S7-1500 controller has been configured in Tag Management of WinCC. The configuration of a STEP 7 project is imported using a TIA export file in zip format.
 - More information:
"Communication > SIMATIC S7-1200, S7-1500 Channel > Configuring the channel > How to download AS symbols offline"
- There is at least one Boolean tag, either in a data block, the tag table, or a block interface.
- A WinCC project is open.
- A picture has been created in Graphics Designer.

Procedure for configuration of supervisions with ProDiag

In STEP 7


1. Create ProDiag function block for the supervisions.
2. Define settings on the ProDiag function block.
3. Define ProDiag supervision settings:
 - Define supervision type.
 - Set the delay time.
 - Select the conditions under which a supervision alarm is triggered.
 - Define the categories and subcategories.
4. Add supervision for a Boolean tag.
You create either global or a local supervision for a Boolean tag.
5. Call the ProDiag function block.
6. Compile and download the project.

In WinCC

1. Insert the "ProDiag overview" control ("ProDiagOverviewControl") into the picture.
2. Specify connection to the PLC and status tag.
3. Configure the display and the representation of the object.
4. Configure the jump to the message view.

In addition, you can have the program flow displayed in the control "GRAPH overview" ("GraphOverviewControl") and the current program status in the control "PLC Code Viewer" ("PlcCodeViewer").

Assignment of icons in the ProDiag overview




ProDiag DB-Name							?
Cat:	E	W	I	C4	C5	C6	
Type:	O	I	R	A	P	M	

The "State" status tag of PLC data type "SV_FB_State" of the ProDiag function block contains the group error bits for the supervision types and categories that you visualize using the ProDiag overview.

You can visualize two types of group error bits in the "ProDiag overview" object:

- Group error bit for supervisions (All, O, I, R, A, P, Merr, Mtxt)
- Group error bit for the categories (C1 ... C6)

The following table shows the assignment of the group error bits of the "State" status tag to the icons in the ProDiag overview.

ProDiag overview	Elements in ProDiag FB	Description
Icons		
	All	Group error bit for all supervision types, excluding message text If value of All = TRUE, at least one supervision was triggered and the icon is visually highlighted in the ProDiag overview.
	SV_Types	Byte for all group error bits of the supervision types
	Mtxt (message text)	Group error bit for all alarms
	-	Tooltip with information on this ProDiag overview
Categories		
E (Error)	C1 (Category)	Error
W (Warning)	C2 (Category)	Warning
	Categories	Group error byte for all categories.
I (Info)	C3 (Category)	Information
C4 ... C6	C4 ... C6 (Category)	Additional categories
Supervision types		
O	O (Operand)	Group error bit for operand supervisions
I	I (Interlock)	Group error bit for interlock supervisions
A	A (Action)	Group error bit for action supervisions
R	R (Reaction)	Group error bit for reaction supervisions
P	P (Position)	Group error bit for position supervisions
M	Merr (Message error)	Group error bit for error texts

7.3.4 Configuring the ProDiag overview

Introduction

The "ProDiag overview" ("ProDiagOverviewControl") is used to supervise a machine or system during Runtime and to gather diagnostic information for occurring errors.

Once you have set the status tag in the object and the connection to a ProDiag FB has been established, the status of the "State" status tag of the corresponding PLC data type is queried. In Runtime, the states of the monitored operands are represented as icons in the ProDiag overview, similar to the signal colors of a traffic light.

You configure the display and representation of the categories and supervision types that are shown in the "ProDiag overview" control in WinCC, independent of the supervision settings in STEP 7.

Requirements

- At least one S7-1500 controller has been created.
- At least one supervision instance has been configured.
- A ProDiag function block and ProDiag data block exist.
- A PC station or an HMI device that supports the ProDiag functionality has been created.
- A connection between the PLC and HMI device has been configured.
- A picture has been created and opened in Graphics Designer.
- A "ProDiag Overview" control has been inserted into the picture.

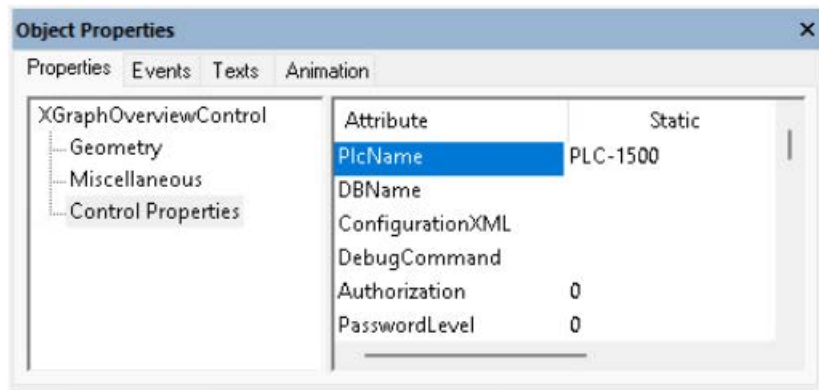
Procedure in Tag Management

1. Select the connection in the navigation area of the Tag Management.
2. Enter the name of the PLC under "Properties > Connection > Miscellaneous > PLC name".

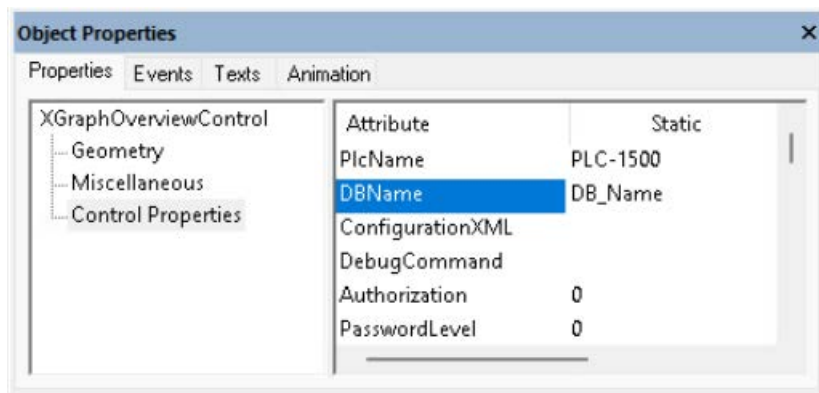
Procedure in Graphics Designer

1. Select the "ProDiag overview" control.
2. In the "Object Properties > Properties" window, click "Control Properties".

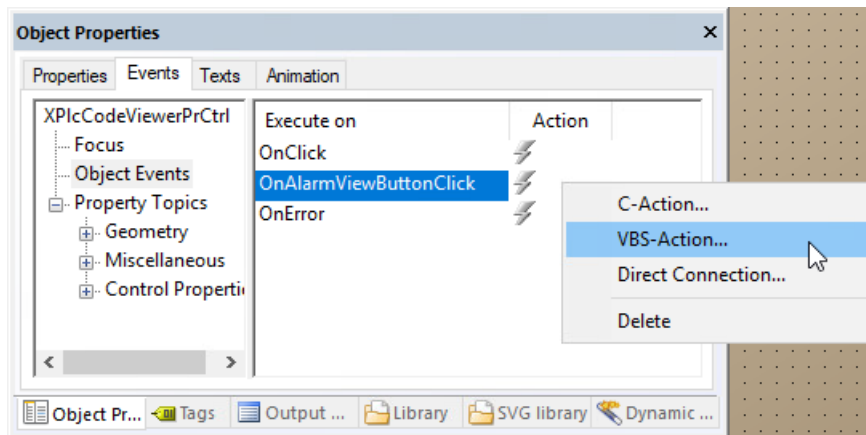
- Enter the name of the PLC that you specified in Tag Management under "PLCName".



- Enter the name of the ProDiag instance data block under "DBName".



- Define the names and colors for the supervision categories.
- Define the names and colors for the supervision types.
- Specify which symbols and buttons are displayed in the control in runtime.
- In a multi-client system, enter the "Server prefix" under "ServerPrefixName".
- You can configure a direct connection or a script at the "Alarm view button click" event (OnAlarmViewButtonClick) under "Object Properties > Events" to jump from the ProDiag overview to the alarm view in Runtime.



Result

The ProDiag overview is inserted in the screen. The current states of monitored events are displayed in Runtime.

See also

Configuring the display of criteria analysis (Page 339)

Configuring a GRAPH overview (Page 321)

7.3.5 Configuring jump to the alarm view

Introduction

After an error has occurred, you have the option in runtime to jump directly from the ProDiag overview or GRAPH overview to an alarm view or a picture with an alarm view.

Typically, the alarm view is configured as "not visible" in error-free operation. The alarm view is displayed by calling it from a ProDiag control.

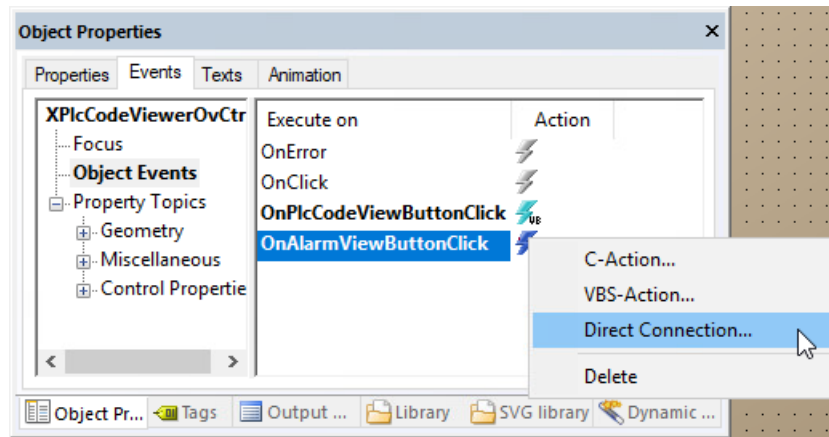
Requirement

- A picture has been created.
- An alarm view has been created.
- The "ProDiag overview" control and/or the "GRAPH overview" control has been configured.

Configuring the jump to the alarm view

1. Select the control.
2. In the "Object Properties" window, click on the "Events" tab.

3. Open the shortcut menu of the "Action" under "Object Events" > "OnAlarmViewButtonClick"



4. Display the picture window with the configured alarm view as follows:
 - Direct Connection: Specify the name of the picture window containing the configured alarm view.
 - VBS script: `ScreenItems("ctrlAlarm"), visible true`

Result

If you press the "Alarm view" button in the configured ProDiag overview in runtime, the picture window with the corresponding alarm view is displayed.

See also

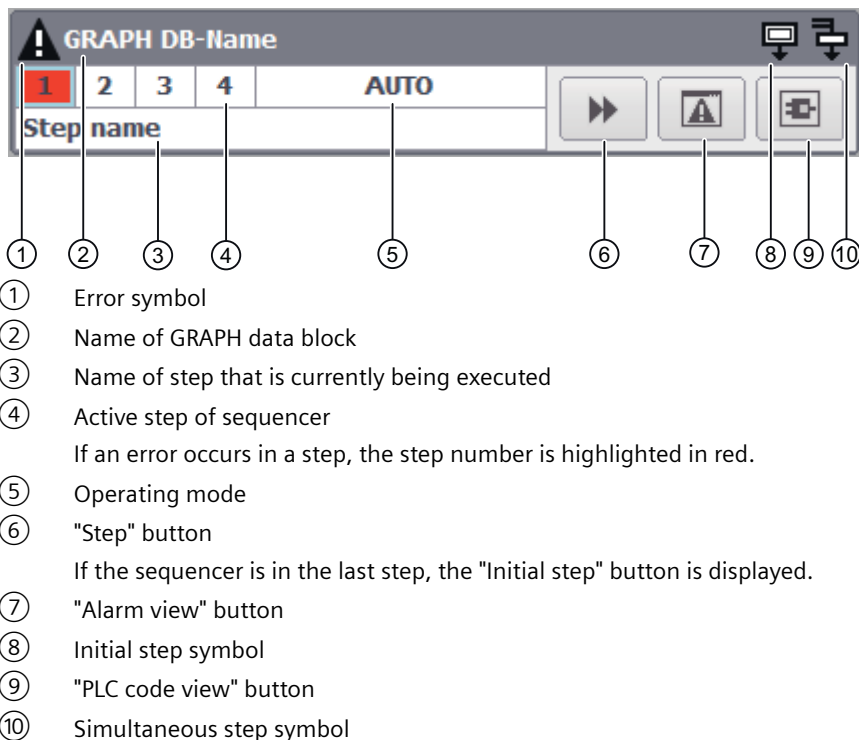
Configuring a GRAPH overview (Page 321)

7.3.6 Configuring the GRAPH overview

7.3.6.1 Displaying the status of the GRAPH sequencer

Introduction

The status of the GRAPH sequencer is visualized via the "GRAPH overview" control.



Displaying the status of the GRAPH sequencer

You connect the GRAPH overview to the PLC via the GRAPH DB tag. After the connection to the control was established, the control shows the active step number of the GRAPH sequencer. The name of the active step is output in the sequencer. If there are additional simultaneous steps besides the currently executed step, the simultaneous step symbol lights up in the GRAPH overview.

Depending on the application, switch between the four operating modes of the sequencer. The currently selected mode is displayed in the GRAPH overview.

If an error occurs during execution of a step, the step in which the error occurs and the error symbol are highlighted visually.

If an error occurs, you have the possibility to jump to the message in the configured alarm view or view the affected program in the PLC code view.

Single-line mode

You have the option of displaying the GRAPH overview in the standard view or in single-line mode. You can, for example, configure several GRAPH overviews in the single-line mode in a picture. This provides you with the overview of the current status of multiple production areas, whose supervisions are summarized in the corresponding GRAPH FBs.

Display of steps and criteria analysis

In extended mode, you activate the additional lines for display of the previous and next step as well as the first operand of the criteria analysis with errors.

GRAPH DB-Name					
200	25	AUTO		▶▶	⚠
S 001	Previous step				
S 002	Current step				
S 021	Next step				
	Name; %Address; Comment				

7.3.6.2 Show step history

Introduction

In the GRAPH overview you can have the previous and next step of the GRAPH sequencer displayed in addition to the current step. For this, the active steps are internally recorded after a screen with a GRAPH overview is called. If an error occurs in a step, you see the actions that were executed before and after the step with an error.

You specify the multilingual step names displayed in the GRAPH overview in a multilingual text list in the user program beforehand.

GRAPH DB-Name					
200	25	AUTO		▶▶	⚠
S 001	Previous step				
S 002	Current step				
S 021	Next step				
	Name; %Address; Comment				

Marking of the steps

The GRAPH sequencer is evaluated from left to right. The step numbers in the GRAPH overview are additionally identified when there is a simultaneous or an alternative branch directly after or before this step. This enables you to see the following information about the program flow at a glance:

- Plus sign
 - Previous step: A simultaneous branch is present before the active step. Multiple steps were active simultaneously.
 - Next step: a simultaneous branch is present after the active step. More than one step will be activated.
- Question mark
 - Previous step: A step different than the first (left) step of the sequencer could have been active before the active step.
 - Next step: an alternative branch is present after the active step. This means that a step different than the first (left) step of the sequencer can also be activated.
- No character: The previous or next step is unambiguous.

Note

Limitations affecting step determination

During the initial call of the GRAPH overview the previous and next steps from the GRAPH block are determined in the sequence of the programmed sequencer.

When calling the GRAPH overview for the first time and after a picture change no record of the active steps exists and a unique determination of the previous step is thus not possible.

The GRAPH overview updates the view at regular intervals. If the sequencer runs rapidly or if you switch often manually between the steps, it is possible that a step other than the active step of the sequencer is determined.

7.3.6.3 Configuring a GRAPH overview

Introduction

You can use the GRAPH overview to view the current program status for the executed steps of a GRAPH sequencer.

Requirement

- A PLC with a GRAPH data block has been created.
- The GRAPH data block contains at least one tag that is visible on the HMI device and is accessible from the HMI device.

Note**Process tag on the HMI device**

The process tag you use for the GRAPH overview must be visible on the HMI device and accessible from the HMI device.

To identify the tags of the GRAPH data block as visible and accessible for an HMI device, open the GRAPH function block, select the block in the work area and select "Edit > Internal parameters visible/accessible from HMI" in the menu bar.

Then compile the program blocks.

- An HMI device has been created.
- A picture has been created.
- The "Object Properties" window is displayed.

Procedure

1. Use drag-and-drop to move the "GRAPH overview" control (WinCC GraphOverviewControl) from the palette "Controls" > "Controls" selection window > "ProDiag Controls" node into the configured picture.
2. Select the "GRAPH overview" control.
3. In the "Object Properties" window, click on "Properties > Control Properties".
4. Enter the name of the connection under "PlcName".
5. Enter the name of the instance of the sequencer under "DBName".
Example: `SeqData.autoMaschine`
6. Specify which icons are to be displayed in the GRAPH overview.
To display the GRAPH overview in compatibility mode without toolbar buttons and operating mode display, enable the "Single-line mode" property (SingleLineMode).
7. Specify the buttons to be displayed in the object.
8. In a multi-client system, enter the "Server prefix" under ServerPrefixName.

9. You can dynamize the properties in the "GRAPH overview" control with tags and color-code states.

More information:

- "Working with WinCC > VBA for Automated Configuration > VBA in the Graphics Designer > Creating Dynamics with VBA"

10. In order to jump to the alarm view and PLC code view in Runtime, you can assign system functions to the buttons in the GRAPH overview under "Object Properties > Events".

More information:

- "Configuring jump to the alarm view (Page 317)"
- "Configuring the jump to the PLC code view (Page 325)"

Displaying the result of the criteria analysis

You have the option of displaying the result of the criteria analysis in the GRAPH overview when an error is present.

The following information is then displayed in the last line of the GRAPH overview:

- Symbol name
- Absolute address
- Value of the first operand with errors
- Comment

To display the criteria analysis, select the "ShowPLCCodeViewerButton" option under "Object Properties > Control Properties".

Note

No information in the GRAPH overview

No information for the criteria analysis is output in the GRAPH overview in the following cases:

- The initial value acquisition was not activated in the block properties or the initial values were not acquired.
 - There is no error in the active step.
-

Displaying the previous and next steps

To display the previous and next steps in the GRAPH overview, select the "ShowPreviousAndNextStep" option under "Object Properties > Control Properties".

Result

The GRAPH overview is inserted in the picture.

The current state of the GRAPH sequencer is displayed in Runtime.

See also

Configuring jump to the alarm view (Page 317)

Configuring the jump to the PLC code view (Page 325)

Configuring the display of criteria analysis (Page 339)

Configuring the ProDiag overview (Page 315)

7.3.6.4 Configuring the operating mode**Introduction**

Four different operating modes are available for executing the GRAPH overview (WinCC GraphOverviewControl):

Auto (default setting)	Automatically switches to the next step when the transition is fulfilled.
TAP	Switches to the next step when the transition is fulfilled and there is an edge change from "0" to "1" at parameter T_PUSH.
TOP	Switches to the next step when the transition is fulfilled or there is an edge change from "0" to "1" at parameter T_PUSH.
Manual	The next step is not enabled automatically when the transition is fulfilled. The steps can be selected and deselected manually.

Note

You set the operating mode by modifying the interface parameters of the GRAPH block in your user program.

Note

The name of the operating mode is language dependent and can be translated for the required Runtime languages.

In runtime, you have the option of renaming the operating mode that is displayed in the GRAPH overview.

Configuring labels for the operating modes

A picture with the configured GRAPH overview is open.

1. In the "Object Properties" window, click on "Properties > Control Properties".
2. Configure the labels for the four operating modes:
 - OperationMode AUTO
 - OperationMode TOP
 - OperationMode TAP
 - OperationMode MAN

7.3.6.5 Configuring the jump to the PLC code view

Introduction

After an error has occurred, you have the option to jump directly from the GRAPH overview to the PLC code view.

Requirement

- A picture has been created.
- The "GRAPH overview" control has been configured.

Configuring the jump to the PLC code view

1. Select the "PLC code view" control.
2. In the "Object Properties" window, click on the "Events" tab.
3. Open the shortcut menu of the action under "Object Events" > "OnPlcCodeViewButtonClick"
4. Display the PLC code view using the function `ShowPLCCCodeViewFromAlarm`:
You can find the function in the "Global Script" editor under "C-Editor > Standard functions > ProDiag".
Parameters:
 - `AlarmScreenName`: Name of the picture that contains the AlarmControl.
 - `AlarmViewName`: Name of the alarm view.
 - `BaseScreenName`: The current picture or the picture in which the "GRAPH overview" control is located.
 - `ScreenWindowName`: Picture window in which the `PLCCCodeViewScreen` picture is displayed.
 - `PLCCCodeViewScreenName`: Name of the picture with the PLC code view.
 - `PLCCCodeViewName`: Name of the PLC code view.
 - `ErrorTag`: In the event of an error, the error tag is used to output information about the error that has occurred.

Example

```

void ShowPLCCodeFromAlarmInView(LPCTSTR AlarmScreenName, LPCTSTR AlarmViewName, LPCTSTR
BaseScreenName, LPCTSTR ScreenWindowName, LPCTSTR PLCCCodeViewScreenName, LPCTSTR
PLCCCodeViewName, LPCTSTR ErrorTag)
{
    BOOL bRet;
    CMN_ERROR err;
    char szError[1024]

    bRet = FALSE;
    memset(&err, 0, sizeof(err));

    bRet = ShowPLCCodeFromAlarmInView(AlarmScreenName, AlarmViewName, BaseScreenName,
ScreenWindowName, PLCCCodeViewScreenName, PLCCCodeViewName, ErrorTag, &err);
    if (FALSE == bRet)
    {
        sprintf(szError, "ShowPLCCodeFromAlarmInView(..) Failed:
0x%081x,0x%081x,0x%081x,0x%081x,0x%081x, [%s]",
        sprintf(szError, "ShowPLCCodeFromAlarmInView(..): ERROR\z\n%ld\\z\n%ld\\z\n%ld\\z\n%ld\
\z\n%ld\\z\n%ld\",
            err.dwError1, err.dwError2, err.dwError3, err.dwError4, err.dwError5,
err.szErrorText);
        if NULL != ErrorTag)
        {
            SetTagChar(ErrorTag, szError);
        }
        sprintf(szError, "ShowPLCCodeFromAlarmInView(..) failed:
0x%081x,0x%081x,0x%081x,0x%081x,0x%081x, [%s]",
            err.dwError1, err.dwError2, err.dwError3, err.dwError4, err.dwError5,
err.szErrorText);
        printf("%s\r\n", szError);
    }
}

```

Result

If you press the "Alarm view" button in the configured ProDiag overview in runtime, the PLC code view is displayed.

See also

Configuring a GRAPH overview (Page 321)

7.3.7 Configuring the PLC code view

7.3.7.1 Configuring the PLC code view

Introduction

To display the PLC program networks in the LAD, FBD and GRAPH programming languages in runtime, insert a PLC code view in your project.

The PLC code view is displayed in Runtime by clicking the "PLC code view" button.

Requirement

- A connection between the PLC and HMI device has been created.
- A picture has been created.
- The control "ProDiag overview" (WinCC ProDiagOverviewControl) and/or the control "GRAPH overview" (WinCC-GraphOverviewControl) has been created and configured in the picture.

Procedure

1. Use drag-and-drop to move the "PLC code view" control (WinCC PlcCodeViewerControl) from the palette "Controls" > "Controls" selection window > "ProDiag Controls" node into the configured picture.

Note

Best Practice

To make it easy to show and hide the view in runtime, create the control in a picture window.

2. In the "Object Properties" window, click on "Properties > Control Properties".
3. Specify additional properties of the control here.
4. In a multi-client system, enter the "Server prefix" under ServerPrefixName.
5. To display or handle errors in the configuration of the display of a network in Runtime, configure a corresponding script under "Object Properties > Events > Object Events > OnError".

Result

The PLC code view is inserted in the screen. In Runtime, PLC user programs that are programmed in the LAD, FBD or GRAPH programming languages can be displayed.

The control is displayed in Runtime if it is activated when a fault has occurred by clicking the "PLC code view" button in the "ProDiag overview" control (WinCC ProDiagOverviewControl) and/or in the "GRAPH overview control" (WinCC-GraphOverviewControl). Alternatively, the control can be activated using a separate button in the picture.

7.3.7.2 Views of the PLC code view

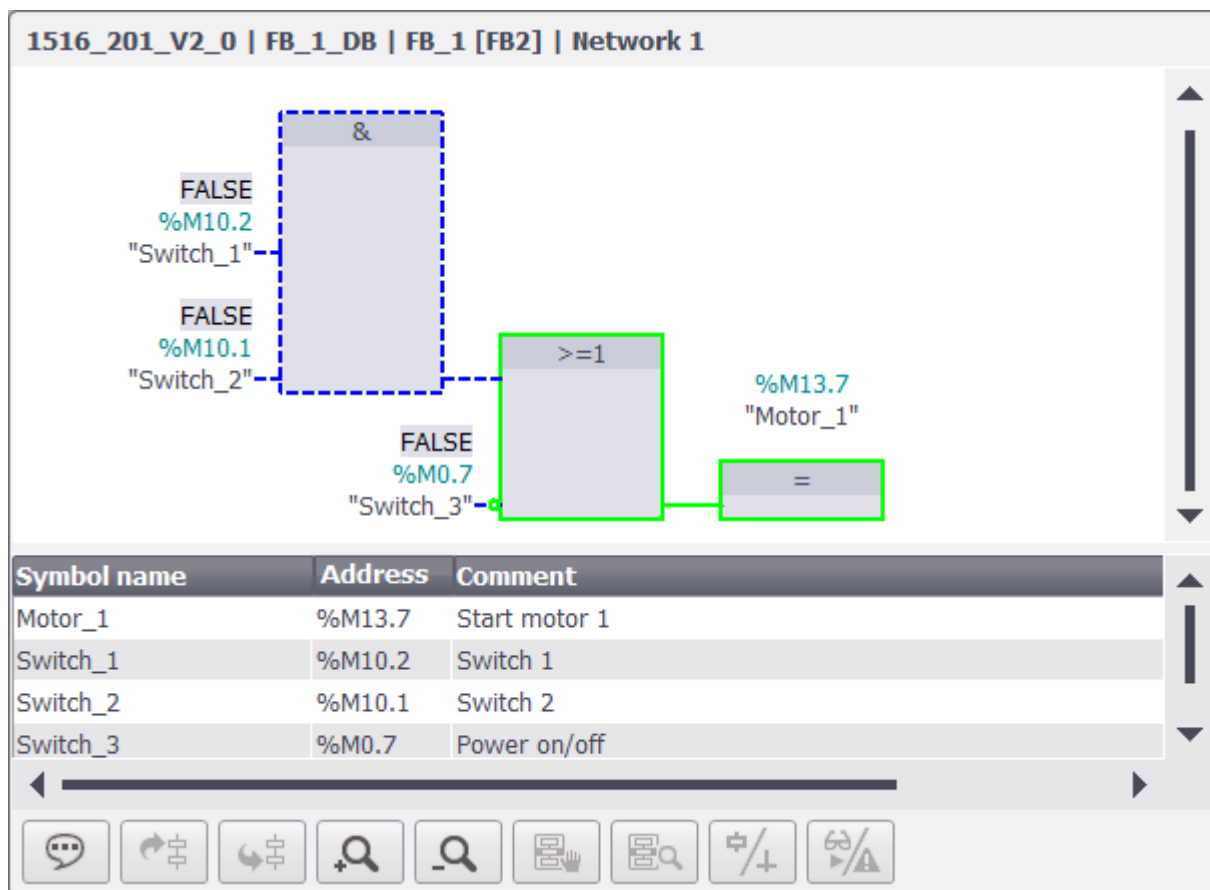
Introduction

In the PLC code view, you display various information about the user program.

- Information area
- Symbol table
- Detail view
- "Transition/Interlock view"
- Initial value/actual value view

Information area

The information area shows the LAD/FBD program code of your user program or the GRAPH sequencer of a GRAPH function block. After the connection to the PLC has been established, the network status is displayed in the information area highlighted via the program code.



Symbol table

The symbol table shows the symbols which the displayed network uses. The three columns of the symbol table display the symbol names of the tags, the absolute address and the comments. As the comments are loaded from the user program, these are displayed in the language that is stored in the PLC.

You can dynamically change the height and width of the symbol table in Runtime.

Detail view

The detail view is also available for displaying your GRAPH sequencer.

The detail view provides detailed information about the selected network and the pending errors. In the detail view you see, for example, the transition of the first active step of the GRAPH sequencer. The detail view is opened in Runtime with the "Details" button.

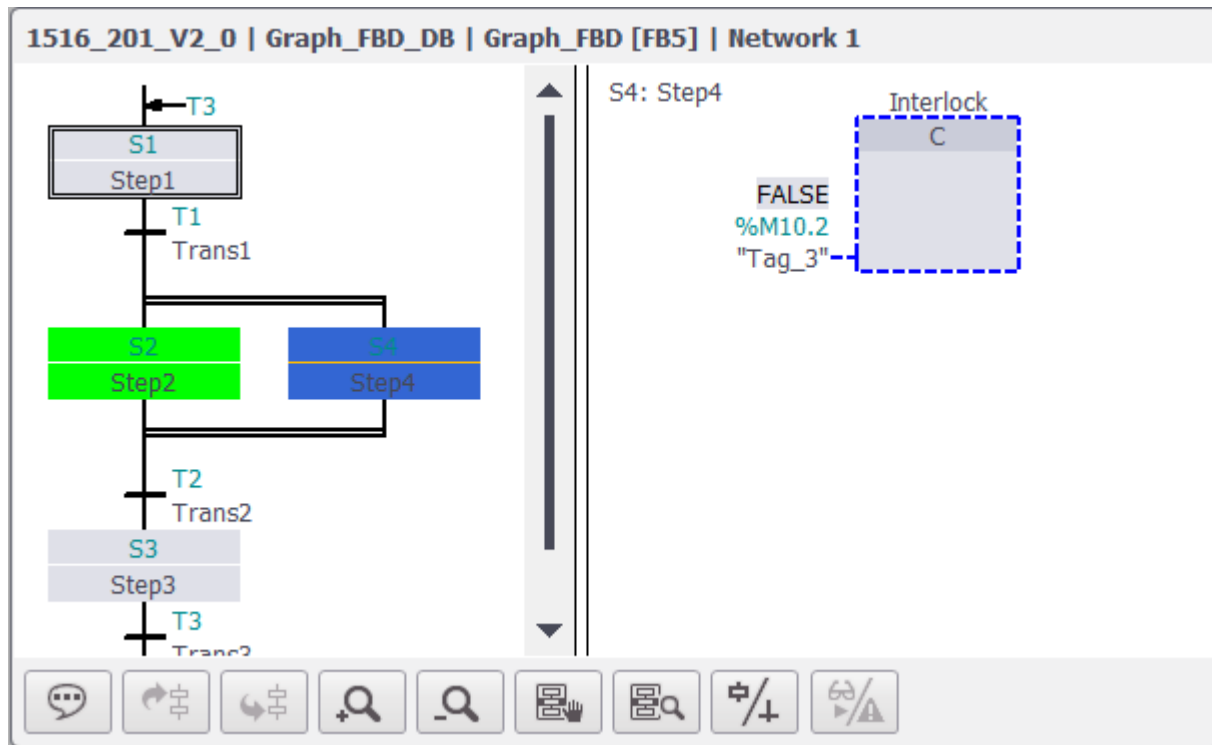
1516_201_V2_0 | Graph_DB | Graph_LAD [FB1] | Network 1

Symbol name	Address	Comment
"Graph_Data".t1		Transition 1
Tag_1	%M20.0	
"Graph_Data".switch1		additional condition

"Transition/Interlock view"

You can switch between the transition/interlock views during the display of your user program. The transition/interlock view is available when the detail view is displayed.

You switch between the transition/interlock views in Runtime by using the "Transition or Interlock" button. When the button is enabled the interlock network is displayed, when disabled the transition network.

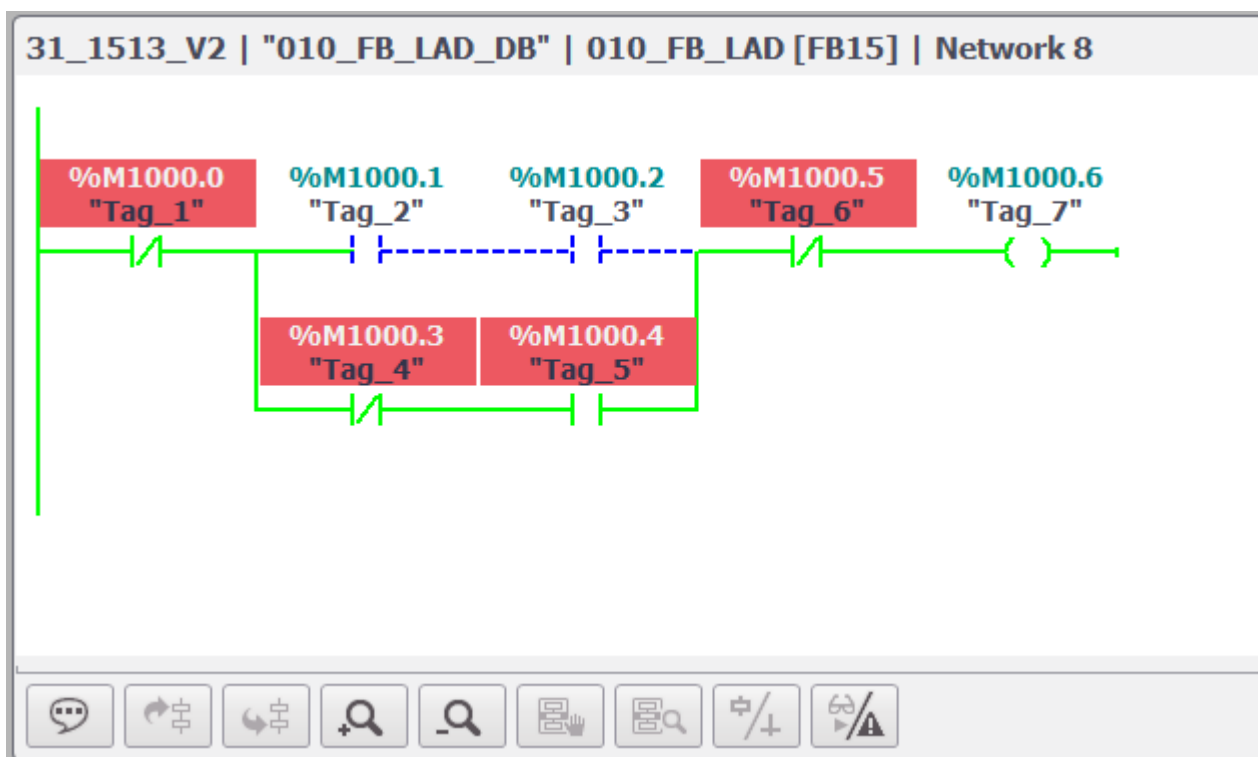


Initial value/actual value view

If you have activated the initial value recording in the user program for the corresponding function block, you can switch in the PLC code view between the initial value/actual value views. The actual value view uses the current values from the PLC and displays the current program status. The initial value view uses the values that were recorded at the time of the error and displays the operands with error and criteria. The operands with error are visually highlighted in the initial value view.








To switch between the actual values and initial values, use the "Initial values or actual values" button. When initial value acquisition is activated, the initial value view is displayed by default in the PLC code view after the jump.



If errors occur, the faulty operands are highlighted in the initial value view in Runtime.



Buttons on the toolbar

The following table shows the toolbar buttons and their meaning.

Operator control	Designation	Function
	"Symbol area"	Shows the symbol table.
	"Previous network"	Navigates to the previous network
	"Next network"	Navigates to the next network
	"Zoom in"	Enlarges the information area.
	"Zoom out"	Reduces the information area.
	"Detail"	Shows the detail view.
	"Step mode"	Switches between manual step selection and automatic selection of the active step.

Operator control	Designation	Function
	"Transition or Interlock"	Switches between the representation of transition and interlock networks,
	"Actual values or initial values"	Switches between actual value view and initial value view.

7.3.7.3 Supported instructions

Introduction


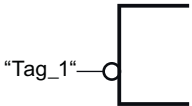

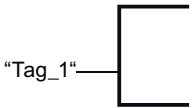
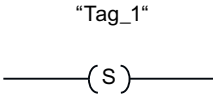

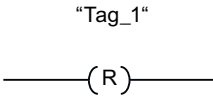
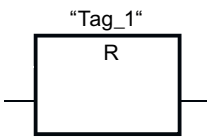
The "PLC code view" control supports instructions in the FBD and LAD programming languages.

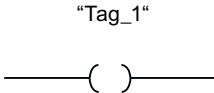
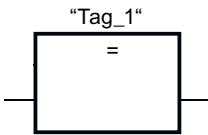
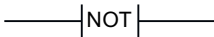

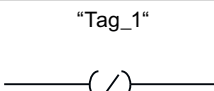
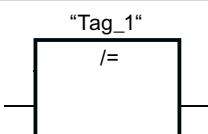
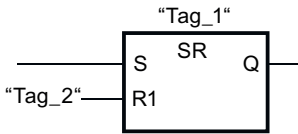
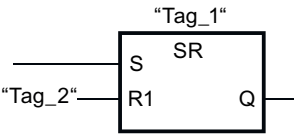
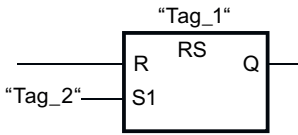
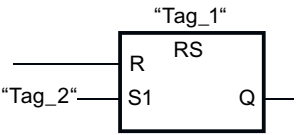
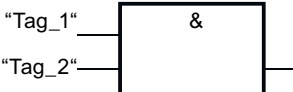
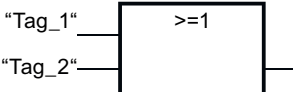
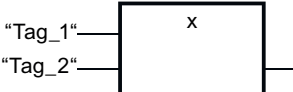
Instructions

The following instructions are supported in the PLC code view:

- Bit logic operations
- Comparator operations
- Timers
- Counters

Bit logic operations

Instruction	LAD	FBD
Normally closed contact		
Normally open contact		
Set output		
Reset output		

Instruction	LAD	FBD
Assignment		
NOT: Invert RLO		
Negated contact		
SR: Set/reset flip-flop		
RS: Reset/set flip-flop		
AND	Is implemented by the corresponding interconnection of normally closed contacts or normally open contacts.	
OR	Is implemented by the corresponding interconnection of normally closed contacts or normally open contacts.	
EXCLUSIVE OR	Is implemented by the corresponding interconnection of normally closed contacts or normally open contacts.	

You can find additional information in the documentation "SIMATIC STEP 7 Basic/ Professional V18 and SIMATIC WinCC V18":

- SiePortal: "STEP 7 and WinCC Engineering V18 > Programming PLC > Instructions" (<https://support.industry.siemens.com/cs/ww/en/view/109815056/162415423115>)

Comparator operations

Instruction	LAD	FBD
CMP ==: Equal		
CMP <>: Not equal		
CMP >=: Greater or equal		
CMP <=: Less or equal		
CMP >: Greater than		
CMP <: Less than		

Note

Comparator: Supported data types

The PLC code view supports the following data types when displaying the sequencer:

- Binary numbers
- Integers
- Floating-point numbers
- Times, exception: S5TIME

You can find additional information in the documentation "SIMATIC STEP 7 Basic/ Professional V18 and SIMATIC WinCC V18":

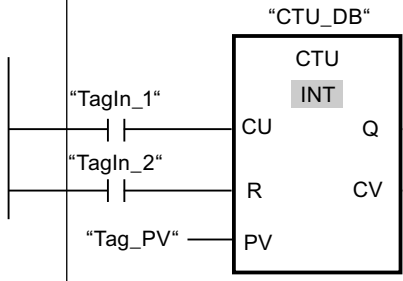
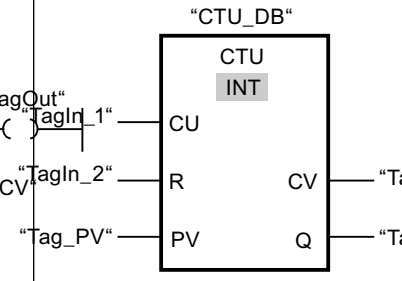
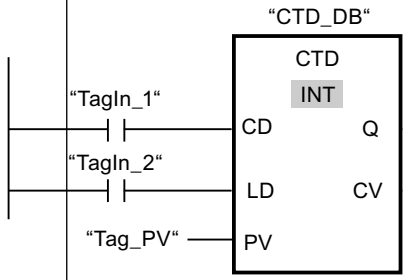
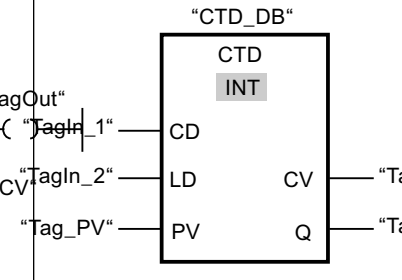
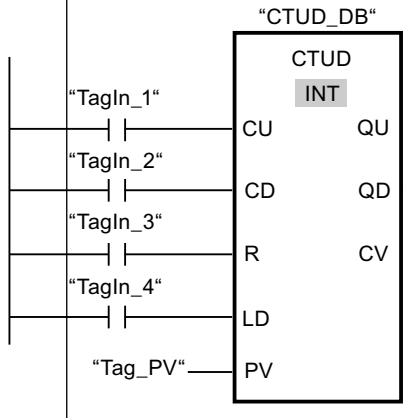
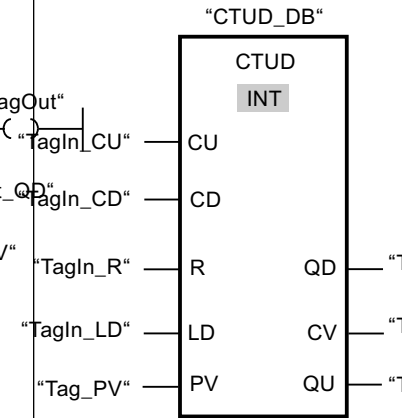
- SiePortal: "STEP 7 and WinCC Engineering V18 > Programming PLC > Instructions" (<https://support.industry.siemens.com/cs/ww/en/view/109815056/162415423115>)

Timers

Instruction	LAD	FBD
TP: Generate pulse		
TON: Generate on-delay		
TOF: Generate off-delay		
TONR: Time accumulator		

Counters *

* Counters support the integer data types.

Instruction	LAD	FBD
CTU: Count up		
CTD: Count down		
CTUD: Count up and down		

See also

Supported data types (Page 337)

SiePortal: "STEP 7 and WinCC Engineering V18 > Programming PLC > Instructions" (<https://support.industry.siemens.com/cs/ww/en/view/109815056/162415423115>)

7.3.7.4 Supported data types

Supported data types

The following table shows the data types supported in the "PLC Code View" control and their display formats:

Data type	Length	Format
Binary numbers		
BOOL *	1 bit	Bool
BYTE	8 bits	Hex
WORD	16 bits	Hex
DWORD	32 bits	Hex
LWORD	64 bits	Hex
Integers		
SINT	8 bits	Dec
USINT	8 bits	Dec
INT	16 bits	Dec
UINT	16 bits	Dec
DINT	32 bits	Dec
UDINT	32 bits	Dec
LINT	64 bits	Dec
ULINT	64 bits	Dec
Floating-point numbers		
REAL	32 bits	Floating point number
LREAL	64 bits	Floating point number
Timers		
S5TIME	16 bits	SIMATIC_Timer
TIME	32 bits	Time
LTIME	64 bits	LTime
Date and time		
DTL **	12 bytes	Date and Time
* Only for the Boolean operators		
** Complete DTL structures are not supported. Only single elements of DTL structures are supported.		

You can find additional information in the documentation "SIMATIC STEP 7 Basic/ Professional V18 and SIMATIC WinCC V18":

- SiePortal: "STEP 7 and WinCC Engineering V18 > Programming PLC > Data types" (<https://support.industry.siemens.com/cs/ww/en/view/109815056/160201843595>)

See also

Supported instructions (Page 332)

SiePortal: "STEP 7 and WinCC Engineering V18 > Programming PLC > Data types" (<https://support.industry.siemens.com/cs/ww/en/view/109815056/160201843595>)

7.3.7.5 Restrictions for the PLC code view

SCL

If you access a program network created with SCL, error code 4100 is output.

Operands and UDTs

Operands that are declared in the "#Temp" or "#InOut" area are generally not supported by the PLC code view. This applies both to elementary data types and to data types that are contained in UDTs. Data types of a UDT can be declared in the "#In" and "#Out" area and displayed in the PLC code view. The same limitations as for elementary data types apply to the data types of the UDT.

Limitation regarding the data types

Using the data types STRING, WSTRING, CHAR, WCHAR, S5TIME prevents the network from being displayed in the PLC code view.

Note

The upstream network must not contain any tags from the "#Temp" or "#InOut" areas of an FB. The following data types may not be used for tags: STRING, WSTRING, CHAR, WCHAR, S5TIME

Note

The 64-bit PLC data types LINT, ULINT and LWORD are mapped to the HMI data type LREAL in the HMI channel. There is a loss of accuracy at values of $> 2^{50}$.

Use of 64-bit data types

The use of 64-bit data types may result in a slight loss of accuracy as these data types are mapped in the HMI channel to the data type Double. It is therefore possible that integer data types are displayed with decimal places.

Addressing of tags

Please note the following restrictions when addressing tags:

- The "PLC code view" control only supports symbolic addressing of tags. If the operand is not addressed symbolically, the network with the operand cannot be displayed and an error message is generated.
- The use of array elements with a tag as index is not supported, e.g. #myArray[MyTag]. Use numerical values when addressing the array elements, for example #myArray[6].
- Slice access enables you to address specific areas within declared variables. The PLC code view only supports the access width "Bit" on the Boolean tags during the slice accesses.

Jump to the PLC code view

For the jump from a supervision alarm to the PLC code view, the instance name must conform to the following naming convention when using supported local operands in a function block: <FB-Name>_DB.

The jump to a function or an organization block is only possible if only global operands are used.

7.3.8 Configuring the display of criteria analysis

Introduction

The "Criteria analysis" control (WinCC CriteriaAnalysisControl) shows the operands in the user program that contain errors and have triggered a selected alarm. In addition to the alarm, the list of operands with errors is shown in the same picture.

Requirement

- A connection has been configured.
- A connection between the PLC and HMI device has been created.
- A picture has been created.
- An alarm control (WinCC AlarmControl) has been configured and connected to the ProDiag controls on the picture.
- More information:
 - Configuring the ProDiag overview (Page 315)
 - Configuring a GRAPH overview (Page 321)

Procedure

1. Use drag-and-drop to move the control "Criteria analysis" (WinCC CriteriaAnalysisControl) from the palette "Controls" > "Controls" selection window > "ProDiag Controls" node into the configured picture.
2. In the "Object Properties" window, click on "Properties > Control Properties".
3. Enter the name of the configured alarm view under "Control Properties > SourceControl".
4. In a multi-client system, enter the "Server prefix" under ServerPrefixName.

See also

Configuring the ProDiag overview (Page 315)

Configuring a GRAPH overview (Page 321)

7.3.9 Functions for displaying PLC code

7.3.9.1 Display in STEP 7

Basics

General information

You can use this function to switch from a screen in WinCC Runtime directly to the point of use of a process tag in the program code of STEP 7. This provides the possibility of quick and simple diagnostics of faults. To speed up the jump function, it is possible to start WinCC and open a project.

During the jump, there is first a check to determine whether the project is already open. If this is not the case, the project is started automatically. In WinCC, the corresponding editor is opened and the point of use, the assignment, the call or the step is searched for.

Header files

The declaration of the functions and structures explained here takes place in the header files:

kopapi.h	API interface definition header file
----------	--------------------------------------

Libraries

The DLL link for the functions explained here is provided in the Lib files kopapi.dll.

kopapi.lib	Library
kopapi.dll	

OpenTIAPortalProject

Description

This function can be used to open a project. This will speed up the individual jump functions. Bear in mind that a program open in the background requires memory and computing time.

Declaration

```

BOOL OpenTIAPortalProject (
    DWORD          dwFlags,
    LPCTSTR        lpszTiaPortalProjectPath,
    LPCTSTR        lpszErrorTag,
    LPCMN_ERROR    lpdmError);

```

Parameters

dwFlags

Bit array in which the individual values are ORed bit-by-bit. dwFlags should be 0 by default.

- KOPAPI_FLAG_TIAPORTAL_CHECK_PROJECT_STATE: If this bit is set, the status of the project is checked. The project is not opened.
- The project is open.
Return value FALSE
error.dwError1 = KOPAPI_E_TIAPORTAL_PROJECT_NOT_OPEN
- The project is open and contains no changes.
Return value TRUE
error.dwError1 = 0
- The project is open and contains changes.
Return value FALSE
error.dwError1 = KOPAPI_E_TIAPORTAL_PROJECT_MODIFIED
- The project is opened read only.
Return value FALSE
error.dwError1 = KOPAPI_E_TIAPORTAL_PROJECT_READ_ONLY

KOPAPI_FLAG_TIAPORTAL_DONT_USE_MODIFIED_PROJECT: If this bit is set, the call is canceled when the project is already open and contains changes.

KOPAPI_FLAG_TIAPORTAL_OPEN_READONLY: When this bit is set to TRUE, the project is opened in write-protected mode in the engineering system of the TIA Portal.

lpszTiaPortalProjectPath

Name of the project including specification of the absolute path, e.g.
"D:\TIAProjects\Project1\Project1.ap19"

Please note that within a C script the backslash has to be written using an Escape sequence:

```
FunctionX(..., "D:\\TIAProjects\\Project1\\Project1.ap19", ...);
```

lpszErrorTag

Name of an internal WinCC tag of the String data type. When asynchronous functions that do not supply a result immediately are called, the error information is returned in lpszErrorTag.

lpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value

TRUE

The function has been completed without any errors.

FALSE

An error has occurred.

Required files

kopapi.h
 kopapi.lib
 kopapi.dll

OpenTIAPortalIECPLByCall**Description**

The function is used for the LAD and FBD languages and shows the preceding logic of a network input of a standard block.

Declaration

```

BOOL OpenTIAPortalIECPLByCall (
    DWORD          dwFlags,
    LPCTSTR        lpszTiaPortalProjectPath,
    LPCTSTR        lpszCpuName,
    LPCTSTR        lpszContainingBlock,
    LPCTSTR        lpszCalledBlock,
    LPCTSTR        lpszPin,
    LPCTSTR        lpszErrorTag,
    LPCMN_ERROR    lpdmError);
  
```

Parameters**dwFlags**

Bit array in which the individual values are ORed bit-by-bit. dwFlags should be 0 by default.

- IECPLVIEWER_PIN_SUBSTRING_SEARCH=0x0001: A substring is sought in the search for the pin name, which means the pin name starts with the string transferred in lpszPin. If this bit is not set, the complete pin name is compared to lpszPin.
- KOPAPI_FLAG_TIAPORTAL_SUPPRESS_PROGRAM_STATUS=0x0004: The TIA Portal does not go into online mode after the block is opened. If this bit is not set, online mode is started after opening the block.
- KOPAPI_FLAG_TIAPORTAL_DONT_USE_MODIFIED_PROJECT 0x0008L: If this bit is set, the call is canceled when the project is already open and contains changes.
- KOPAPI_FLAG_TIAPORTAL_OPEN_READONLY: When this bit is set to TRUE, the project is opened in write-protected mode in the engineering system of the TIA Portal.

lpszTiaPortalProjectPath

Name of the project including specification of the absolute path, e.g.
 "D:\TIAProjects\Project1\Project1.ap19"

Please note that within a C script the backslash has to be written using an Escape sequence:

FunctionX(..., "D:\\TIAProjects\\Project1\\Project1.ap19", ...);

IpszCpuName

Name of the S7-CPU. The name is identical to the station name displayed in the project tree in the TIA Portal.

IpszContainingBlock

Name of the block to be opened and displayed or name of the instance of an FB.

The following can be used as name:

- Name of a single instance DB. Its FB is then displayed. Example "Station1"
- Name of a multi-instance in an instance DB. Its FB is then displayed. When multi-instance name paths are specified, this is the data hierarchy as it is shown in the DB editor, for example, and not the call structure. The first part of the name ("Line1") cannot be enclosed in quotes, because this is a global icon, as can be recognized by the context. Quotation marks are required for the individual name components if they contain special characters such as spaces, periods etc. Example: "Line1.Cell1.Station1"
- Name of an FC or OB

Using the name of an FB is not permissible.

IpszCalledBlock

Name of the local or global instance that is called in the code block belonging to IpszContainingBlock.

- With local instances, the hash symbol # must also be included here, e.g. "#feeder1".
- With global instance DBs, the global name must be specified without the hash symbol #, e.g. "feeder3".

The use of the name of an FC is not allowed.

If IpszCalledBlock is called several times within IpszContainingBlock or its FB, the entry point is always the first call of IpszCalledBlock.

With IpszCalledBlock=ZERO, only IpszContainingBlock is opened and shown in the status, but there is no search for a specific block call or a specific network. IpszPin is ignored in this case.

IpszPin

Name of the input pin of IpszCalledBlock. The parameter is used to make the specified pin visible within the network in the editor.

Only IpszCalledBlock is shown as visible with IpszPin=ZERO.

IpszErrorTag

Name of an internal WinCC tag of the String data type. When asynchronous functions that do not supply a result immediately are called, the error information is returned in IpszErrorTag.

IpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value

TRUE

The function has been completed without any errors.

FALSE

An error has occurred.

Required files

kopapi.h

kopapi.lib

kopapi.dll

OpenTIAPortalIECPLByAssignment

Description

The function is used for the LAD and FBD languages and shows the assignment to an operand and its preceding logic.

Declaration

```
BOOL OpenTIAPortalIECPLByAssignment (  
    DWORD        dwFlags,  
    LPCTSTR      lpszTiaPortalProjectPath,  
    LPCTSTR      lpszCpuName,  
    LPCTSTR      lpszContainingBlock,  
    LPCTSTR      lpszOperand,  
    LPCTSTR      lpszErrorTag,  
    LPCMN_ERROR  lpdmError);
```

Parameters

dwFlags

Bit array in which the individual values are ORed bit-by-bit. dwFlags should be 0 by default.

- **KOPAPI_FLAG_TIAPORTAL_SUPPRESS_PROGRAM_STATUS=0x0004:** The TIA Portal does not go to online mode after the block has been opened. If this bit is not set, online mode is started after opening the block.
- **KOPAPI_FLAG_TIAPORTAL_DONT_USE_MODIFIED_PROJECT 0x0008L:** If this bit is set, the call is canceled when the project is already open and contains changes.
- **KOPAPI_FLAG_TIAPORTAL_OPEN_READONLY:** When this bit is set to TRUE, the project is opened in write-protected mode in the engineering system of the TIA Portal.

IpszTiaPortalProjectPath

Name of the project including specification of the absolute path, e.g.
"D:\TIAProjects\Project1\Project1.ap19"

Please note that within a C script the backslash has to be written using an Escape sequence:

FunctionX(..., "D:\\TIAProjects\\Project1\\Project1.ap19", ...);

IpszCpuName

Name of the S7-CPU. The name is identical to the station name displayed in the project tree in the TIA Portal.

IpszContainingBlock

Name of the block to be opened and displayed or name of the instance of an FB.

The following can be used as name:

- Name of a single instance DB. Its FB is then displayed. Example "Station1"
- Name of a multi-instance in an instance DB. Its FB is then displayed. When multi-instance name paths are specified, this is the data hierarchy as it is shown in the DB editor, for example, and not the call structure. The first part of the name ("Line1") cannot be enclosed in quotes, because this is a global icon, as can be recognized by the context. Quotation marks are required for the individual name components if they contain special characters such as spaces, periods etc. Example: "Line1.Cell1.Station1"
- Name of an FC or OB

Using the name of an FB is not permissible.

IpszOperand

Name of a local or global operand to which an assignment is made.

Name of the local or global instance that is called in the code block belonging to IpszContainingBlock.

- For local operands, the hash sign # must also be specified here.
- For global operands, the global name without hash sign # must be specified.

If IpszOperand is written several times within IpszContainingBlock or its FB, the entry point is always the first write access of IpszOperand.

IpszErrorTag

Name of an internal WinCC tag of the String data type. When asynchronous functions that do not supply a result immediately are called, the error information is returned in IpszErrorTag.

IpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value

TRUE

The function has been completed without any errors.

FALSE

An error has occurred.

Required files

kopapi.h

kopapi.lib

kopapi.dll

OpenTIAPortalS7GraphByBlock

Description

The function is used for the S7 Graph languages and shows a step in a sequencer.

Declaration

```
BOOL OpenTIAPortalS7GraphByBlock (  
    DWORD        dwFlags,  
    LPCTSTR      lpszTiaPortalProjectPath,  
    LPCTSTR      lpszCpuName,  
    LPCTSTR      lpszBlock,  
    DWORD        dwStepNumber,  
    LPCTSTR      lpszErrorTag,  
    LPCMN_ERROR  lpdmError);
```

Parameters

dwFlags

Bit array in which the individual values are ORed bit-by-bit.

Optimal default setting: dwFlags=0.

- **KOPAPI_FLAG_TIAPORTAL_SUPPRESS_PROGRAM_STATUS=0x0004:**
The TIA Portal does not go to online mode after the block has been opened.
If this bit is not set, online mode is started after opening the block.
- **KOPAPI_FLAG_TIAPORTAL_DONT_USE_MODIFIED_PROJECT 0x00000008L:**
When this bit is set, the call is aborted if the project is already open and contains changes.
- **KOPAPI_FLAG_TIAPORTAL_OPEN_READONLY:**
When this bit is set to TRUE, the project is opened in read-only mode in the engineering system of TIA Portal.

IpszTiaPortalProjectPath

Name of the project including specification of the absolute path, e.g.
"D:\TIAProjects\Project1\Project1.ap19"

In a C script, use an escape sequence to write the backslash:

- `FunctionX(..., "D:\\TIAProjects\\Project1\\Project1.ap19", ...);`

IpszCpuName

Name of the S7-CPU.

The name is identical to the station name displayed in the project tree in the TIA Portal.

IpszBlock

Instance name of the S7-Graph block to be displayed.

dwStepNumber

Number of the step to be displayed.

`dwStepNumber=0` automatically searches for the active step and enables "Track active step" mode.

IpszErrorTag

Name of an internal WinCC tag from the data type string

When asynchronous functions that do not supply a result immediately are called, the error information is returned in `IpszErrorTag`.

IpdmError

Pointer to the data of the extended error message in the `CMN_ERROR` structure.

The system writes error information to this structure if an error occurs.

Return value**TRUE**

The function has been completed without any errors.

FALSE

An error has occurred.

Required files

`kopapi.h`

`kopapi.lib`

`kopapi.dll`

Example: Integration in a WinCC function

Description

The example shows the embedding of the function calls in a user-defined function. For better maintainability, the call should be swapped out to a global script function in which the path to the TIA Portal and the name of the PLC station are also determined.

```
void OnClick(char* screenName, char* objectName, char* propertyName)
{
    // Funktionen bekannt machen'
    #pragma code("KOPAPI.dll")
    #include "KOPAPI.h"
    #pragma code()

    BOOL useTiaPortal = TRUE; // use the TIA Portal or the viewer control?
    char* pTiaPortalProject = "c:\\Projects\\myproject\\myproject.apl4";
    char* pStationName = "PLC_Name"; // TODO: read from internal tag
    char* pContainingBlock = "Block_IDB"; // TODO: get from current selection
    char* pOperand = "OUT"; // TODO: get from current selection
    CMN_ERROR error;
    BOOL result;

    if(useTiaPortal)
    {
        result = OpenTIAPortalIECPLByAssignment(0, pTiaPortalProject,
        pStationName, pContainingBlock, pOperand, &error);
    }
    else
    {
        char *pServerPrefix = NULL, *pTagPrefix = NULL, *pWindowPrefix =
        NULL;
        // determine ServerPrefix of the current environment
        GetServerTagPrefix(&pServerPrefix, &pTagPrefix, &pWindowPrefix);
        // make the screen which contains the viewer control visible
        SetVisible("SYSTEM#Basic_Screen", "Screen_window_IECPLViewer",
        TRUE);
        result = OpenViewerIECPLByAssignment(0, pServerPrefix,
        "SYSTEM#IECPLViewer", "IECPLViewerObject", pStationName, pContainingBlock,
        pOperand, &error);
    }
}
```

7.3.9.2 Display in the PLC code view

Basics

General information

You can use these functions to display the current program status of PLC programs in a PLC code view.

The screen that contains the PLC code view must have been opened via `ActivateScreen()`, for example.

Header files

The declaration of the functions and structures explained here takes place in the header files:

kopapi.h	API interface definition header file
----------	--------------------------------------

Libraries

The DLL link for the functions explained here is provided in the Lib files: `pdecsccli.dll`

kopapi.lib	Library
kopapi.dll	

Note on defining multi-instance names

When multi-instance name paths are specified, this is the data hierarchy as it is shown in the DB editor, for example, and not the call structure. The first part of the name ("Line1") cannot be enclosed in quotes, because this is a global icon, as can be recognized by the context. Quotation marks are required for the individual name components if they contain special characters such as spaces, periods etc. Example: "Line1.Cell1.Station1".

Names that do not contain special characters must not be put in quotation marks.

OpenViewerS7GraphByBlock

Description

The function shows a step from a sequencer called in the PLC language S7-Graph in the PLC code view.

Declaration

```

BOOL OpenViewerS7GraphByBlock (
    DWORD          dwFlags,
    LPCTSTR        lpszServerPrefix,
    LPCTSTR        lpszPictureName,
    LPCTSTR        lpszObjectName,
    LPCTSTR        lpszCpuName,
    LPCTSTR        lpszBlock,
    DWORD          dwStepNumber,
    LPCMN_ERROR    lpdmError);

```

Parameter**dwFlags**

Bit array in which the individual values are ORed bit-by-bit.

Note

The bit 0x4 must be set to show hierarchical comments.

IpszServerPrefix

The parameter is reserved for later upgrades.

IpszPictureName

Name of the screen with the PLC code view.

IpszObjectName

Name of the PLC code view.

IpszCpuName

Name of the S7-CPU. The name is identical to the station name displayed in the project tree in the TIA Portal. No commas are permitted in the name.

IpszBlock

Instance name of the S7-Graph block to be displayed. If the name contains special characters such as spaces, periods etc., quotation marks must be used.

dwStepNumber

Number of the step to be displayed.

dwStepNumber=0 automatically searches for the active step and enables "Track active step" mode.

lpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value**TRUE**

The function has been completed without any errors.

FALSE

An error has occurred.

Required files

kopapi.h

kopapi.lib

kopapi.dll

Example

The example shows the embedding of the function call in a user-defined C function. For better maintainability, the call should be swapped out to a global script function in which the name of the PLC station is also determined.

```

BOOL OpenViewerS7GraphByBlock(char* screenName, char* objectName, char*
cpuName, char* instanceDBName)
{
#pragma code("kopapi.dll")
#include "kopapi.h"
#pragma code()
BOOL result;
CMN_ERROR error;
char* serverPrefix = "";
DWORD dwFlags = 0;
DWORD stepNumber = 0;
result = OpenViewerS7GraphByBlock(dwFlags, serverPrefix, screenName,
objectName,
cpuName, instanceDBName, stepNumber, &error);
if(!result)
{
// there are only few reasons why the call to OpenViewerS7GraphByBlock will
// fail, in most cases the viewer control could not be found
// most of the errors have to be handled in the OnError event of the viewer
printf("OpenViewerS7GraphByBlock failed: err1=%ld, err2=%ld, err3=%ld,
err4=%ld, err5=%ld, text=\"%s\"\r\n", result, error.dwError1,
error.dwError2, error.dwError3, error.dwError4, error.dwError5,
error.szErrorText);
}
return result;
}

```

OpenViewerIECPLByCall

Description

The function shows the preceding logic of a network input of a standard block in the PLC code view in the PLC languages LAD and FBD.

Note

If the input is occupied by a constant (TRUE, FALSE), this value is not displayed in the PLC code view. To display the value in the PLC code view correctly, you should allocate a tag to the input that has the appropriate value.

Declaration

```
BOOL OpenViewerIECPLByCall (  
    DWORD        dwFlags,  
    LPCTSTR      lpszServerPrefix,  
    LPCTSTR      lpszPictureName,  
    LPCTSTR      lpszObjectName,  
    LPCTSTR      lpszCpuName,  
    LPCTSTR      lpszContainingBlock,  
    LPCTSTR      lpszCalledBlock,  
    LPCTSTR      lpszPin,  
    LPCMN_ERROR  lpdmError);
```

Parameter

dwFlags

Bit array in which the individual values are ORed bit-by-bit.

Note

The bit 0x4 must be set to show hierarchical comments.

- IECPLVIEWER_PIN_SUBSTRING_SEARCH=0x0001: A substring is sought in the search for the pin name, which means the pin name starts with the string transferred in lpszPin. If this bit is not set, the complete pin name is compared to lpszPin.

lpszServerPrefix

The parameter is reserved for later upgrades.

lpszPictureName

Name of the screen with the PLC code view.

lpszObjectName

Name of the PLC code view.

lpszCpuName

Name of the S7-CPU. The name is identical to the station name displayed in the project tree in the TIA Portal. No commas are permitted in the name.

lpszContainingBlock

Name of the block to be opened and displayed or name of the instance of an FB.

The following can be used as the name:

- Name of a single instance DB. Its FB is then displayed. Example "Station1"
- Name of a multi-instance in an instance DB. Its FB is then displayed. When multi-instance name paths are specified, these are data hierarchies such as those displayed in the DB editor, and not those in the call structure. The first part of the name ("Line1") cannot be enclosed in quotes, because this is a global icon, as can be recognized by the context. Quotation marks are required for the individual name components when special characters such as spaces, dots, etc., occur in it. Example: "Line1.Cell1.Station1"
- Name of an FC or OB

The use of the name of a FB is not allowed.

IpszCalledBlock

Name of the local or global instance that is called in the code block belonging to IpszContainingBlock.

- For local instances, the hash sign # must be specified here, for example, "#feeder1".
- For global instances, the global name without hash sign # must be specified here, for example, "feeder3".

The use of the name of an FC is not allowed.

If IpszCalledBlock is called several times within IpszContainingBlock or its FB, the entry point is always the first call of IpszCalledBlock.

IpszPin

Name of the input pin of IpszCalledBlock. The parameter is used to display the network interconnected to the input pin in the PLC code view.

IpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value

TRUE

The function has been completed without any errors.

FALSE

An error has occurred.

Required files

kopapi.h

kopapi.lib

kopapi.dll

Example

The example shows the embedding of the function call in a user-defined C function. For better maintainability, the call should be swapped out to a global script function in which the name of the PLC station is also determined.

```

BOOL OpenCodeViewerByCall(BOOL matchSubstringPin, char* screenName, char*
objectName, char* cpuName, char* containingBlock, char* calledBlock, char*
pinName)
{
#pragma code("kopapi.dll")
#include "kopapi.h"
#pragma code()
BOOL result;
CMN_ERROR error;
char* serverPrefix = "";
DWORD dwFlags = 0;
if(matchSubstringPin)
    dwFlags |= KOPAPI_FLAG_TIAPORTAL_PIN_SUBSTRING_SEARCH;
result = OpenViewerIECPLByCall(dwFlags, serverPrefix, screenName,
objectName,
    cpuName, containingBlock, calledBlock, pinName, &error);
if(!result)
{
    // there are only few reasons why the call to OpenViewerIECPLByCall will
fail, in // most cases the viewer control could not be found
    // most of the errors have to be handled in the OnError event of the viewer
    printf("OpenViewerIECPLByCall failed: err1=%ld, err2=%ld, err3=%ld,
err4=%ld, err5=%ld, text=\"%s\"\\r\\n", result, error.dwError1,
error.dwError2, error.dwError3, error.dwError4, error.dwError5,
error.szErrorText);
}
return result;
}

```

OpenViewerIECPLByFCCall

Description

The function shows the preceding logic of a network input of a standard block with consideration of the UDT instance in the PLC code view for the PLC languages LAD and FBD.

Note

If the input is occupied by a constant (TRUE, FALSE), this value is not displayed in the PLC code view. To display the value in the PLC code view correctly, you should allocate a tag to the input that has the appropriate value.

Declaration

```
BOOL OpenViewerIECPLByFCCall (
    DWORD          dwFlags,
    LPCTSTR        lpszServerPrefix,
    LPCTSTR        lpszPictureName,
    LPCTSTR        lpszObjectName,
    LPCTSTR        lpszCpuName,
    LPCTSTR        lpszContainingBlock,
    LPCTSTR        lpszCalledBlock,
    LPCTSTR        lpszPin,
    LPCTSTR        lpszUdtInstance
    LPCMN_ERROR    lpdmError);
```

Parameters

dwFlags

Bit array in which the individual values are ORed bit-by-bit.

Note

The bit 0x4 must be set to show hierarchical comments.

- IECPLVIEWER_PIN_SUBSTRING_SEARCH=0x0001: A substring is sought in the search for the pin name, which means the pin name starts with the string transferred in lpszPin. If this bit is not set, the complete pin name is compared to lpszPin.

lpszServerPrefix

The parameter is reserved for future development and must be an empty string ("").

lpszPictureName

Name of the screen with the PLC code view.

lpszObjectName

Name of the PLC code view.

lpszCpuName

Name of the S7-CPU. The name is identical to the station name displayed in the project tree in the TIA Portal. No commas are permitted in the name.

lpszContainingBlock

Name of the block to be opened and displayed or name of the instance of an FB.

The following can be used as name:

- Name of a single instance DB. Its FB is then displayed. Example "Station1"
- Name of a multi-instance in an instance DB. Its FB is then displayed. When multi-instance name paths are specified, this is the data hierarchy as it is shown in the DB editor, for example, and not the call structure. The first part of the name ("Line1") cannot be enclosed in quotes, because this is a global icon, as can be recognized by the context. Quotation marks are required for the individual name components if they contain special characters such as spaces, periods etc. Example: "Line1.Cell1.Station1"
- Name of an FC or OB

Using the name of an FB is not permissible.

IpszCalledBlock

Name of the local or global instance that is called in the code block belonging to IpszContainingBlock.

- With local instances, the hash symbol # must also be included here, e.g. "#feeder1".
- With global instance DBs, the global name must be specified without the hash symbol #, e.g. "feeder3".

The use of the name of an FC is not allowed.

If IpszCalledBlock is called several times within IpszContainingBlock or its FB, the entry point is always the first call of IpszCalledBlock.

IpszPin

Name of the input pin of IpszCalledBlock. The parameter is used to display the network interconnected to the input pin in the PLC code view.

IpszUdtInstance

The parameter is used to limit the display of FBs or FCs called multiple times. The limitation is based on an UDT instance interconnected to a given input pin or inout pin.

IpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value

TRUE

The function has been completed without any errors.

FALSE

An error has occurred.

Required files

kopapi.h

kopapi.lib

kopapi.dll

Example

The example shows the embedding of the function call in a user-defined C function. For better maintainability, the call should be swapped out to a global script function in which the name of the PLC station is also determined.

```

BOOL OpenCodeViewerByFCCall(BOOL matchSubstringPin, char* screenName,
char* objectName, char* cpuName, char* containingBlock, char* calledBlock,
char* pinName, char* udtInstance)
{
#pragma code("kopapi.dll")
#include "kopapi.h"
#pragma code()
BOOL result;
CMN_ERROR error;
char* serverPrefix = "";
DWORD dwFlags = 0;
if(matchSubstringPin)
    dwFlags |= KOPAPI_FLAG_TIAPORTAL_PIN_SUBSTRING_SEARCH;
result = OpenViewerIECPLByFCCall(dwFlags, serverPrefix, screenName,
objectName, cpuName, containingBlock, calledBlock, pinName, udtInstance,
&error);
if(!result)
{
    // there are only few reasons why the call to OpenViewerIECPLByFCCall will
    fail,
    // in most cases the viewer control could not be found
    // most of the errors have to be handled in the OnError event of the viewer
    control
    printf("OpenViewerIECPLByFCCall failed: err1=%ld, err2=%ld, " err3=%ld,
err4=%ld, err5=%ld, text=\"%s\"\r\n", result, error.dwError1,
error.dwError2, error.dwError3, error.dwError4, error.dwError5,
error.szErrorText);
}
return result;
}

```

OpenViewerIECPLByAssignment

Description

The function shows the assignment to an operand and its preceding logic in the PLC code view for the PLC languages LAD and FBD.

Declaration

```
BOOL OpenViewerIECPLByAssignment (  
    DWORD        dwFlags,  
    LPCTSTR      lpszServerPrefix,  
    LPCTSTR      lpszPictureName,  
    LPCTSTR      lpszObjectName,  
    LPCTSTR      lpszCpuName,  
    LPCTSTR      lpszContainingBlock,  
    LPCTSTR      lpszOperand,  
    LPCMN_ERROR  lpdmError);
```

Parameter

dwFlags

Bit array in which the individual values are ORed bit-by-bit.

Note

The bit 0x4 must be set to show hierarchical comments.

lpszServerPrefix

The parameter is reserved for later upgrades.

lpszPictureName

Name of the screen with the PLC code view.

lpszObjectName

Name of the PLC code view.

lpszCpuName

Name of the S7-CPU. The name is identical to the station name displayed in the project tree in the TIA Portal. No commas are permitted in the name.

lpszContainingBlock

Name of the block to be opened and displayed or name of the instance of an FB.

The following can be used as name:

- Name of a single instance DB. Its FB is then displayed. Example "Station1"
- Name of a multi-instance in an instance DB. Its FB is then displayed. When multi-instance name paths are specified, this is the data hierarchy as it is shown in the DB editor, for example, and not the call structure. The first part of the name ("Line1") cannot be enclosed in quotes, because this is a global icon, as can be recognized by the context. Quotation marks are required for the individual name components if they contain special characters such as spaces, periods etc. Example: "Line1.Cell1.Station1"
- Name of an FC or OB

Using the name of an FB is not permissible.

IpszOperand

Name of a local or global operand to which an assignment is made.

Name of the local or global instance that is called in the code block belonging to IpszContainingBlock. For global operands, the global name without hash sign # must be specified.

The following restrictions apply to operands:

- Tags from the "TEMP" area cannot be used
- Input tags cannot be used
- Static tags are only allowed in FBs
- Networks within an FC can only be displayed if no local tags are used within the network
- Networks within an FB that use tags from the "TEMP" area cannot be displayed

If IpszOperand is written several times within IpszContainingBlock or its FB, the entry point is always the first write access of IpszOperand.

IpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value

TRUE

The data was transmitted correctly to the PLC code view. Error messages such as "Operand is not supported" or "Operand not found" are output in the PLC code view and cannot be queried using the function.

FALSE

An error has occurred.

Required files

kopapi.h

kopapi.lib

kopapi.dll

Example

The example shows the embedding of the function call in a user-defined C function. For better maintainability, the call should be swapped out to a global script function in which the name of the PLC station is also determined.

```

BOOL OpenCodeViewerByAssignment(char* screenName, char* objectName, char*
cpuName, char* containingBlock, char* operand)
{
#pragma code("kopapi.dll")
#include "kopapi.h"
#pragma code()
BOOL result;
CMN_ERROR error;
char* serverPrefix = "";
DWORD dwFlags = 0;
result = OpenViewerIECPLByAssignment(dwFlags, serverPrefix, screenName,
objectName, cpuName, containingBlock, operand, &error);
if(!result)
{
// there are only few reasons why the call to OpenViewerIECPLByAssignment
will
// fail, in most cases the viewer control could not be found
// most of the errors have to be handled in the OnError event of the viewer
printf("OpenViewerIECPLByAssignment failed: err1=%ld, err2=%ld, err3=%ld,
err4=%ld, err5=%ld, text=\"%s\"\r\n", result, error.dwError1,
error.dwError2, error.dwError3, error.dwError4, error.dwError5,
error.szErrorText);
}
return result;
}

```

IsJumpableProDiagAlarm

Description

The function returns a Boolean value.

The Boolean value contains the information on whether a jump to the PLC code of the selected alarm is possible.

Definition

```

BOOL WINAPI IsJumpableProDiagAlarm (
LPCSTR screenName,
LPCSTR objectName,
long id,
LPCMN_ERRORA lpdmError)

```

Parameters

screenName

Pointer to the data of the screen in which the relevant object is configured.

objectName

Pointer to the data with the name of the respective object (alarm)

id

Number of the alarm in the alarm list, not the ID of the alarm.

If several alarms are selected, the value is "0".

lpdmError

Pointer to the data of the extended error message in the CMN_ERROR structure. The system writes error information to this structure if an error occurs.

Return value

TRUE

The jump to the PLC code of the selected alarm is possible.

FALSE

The jump to the PLC code of the selected alarm is not possible.

Required files

kopapi.h

kopapi.lib

kopapi.dll

Example

The example shows the embedding of the function call in a user-defined C function, which is started when an alarm is selected in the alarm view.

```
#include "GlobalDefinitions.h"
void OnSelectedIdChanged(char* screenName, char* objectName, long id) {
    #pragma code("KOPAPI.dll")
    #include "kopapi.h"
    #pragma code()
    CMN_ERROR errorStruct;
    BOOL bResult;

    bResult = IsJumpableProDiagAlarm ( screenName, objectName, id,
&errorStruct);
    SetPropBOOL ( screenname, "Button_Jump", "Enabled", bResult);
}
```

7.3.9.3 Error-handling

General information

Execution of the functions for the network entry is divided in a synchronous part and an asynchronous part. The synchronous part checks the parameters and transfers them to the asynchronous part.

The return value of the functions specifies whether an error has occurred in the asynchronous section of the function. If an error has occurred, the return value is FALSE. These types of errors occur when parameters such as the parameter `lpszErrorTag` are not supplied or supplied incorrectly.

Errors that occur in the asynchronous functions are reported through the `lpszErrorTag` parameter. Such errors include: Project not found, block does not exist, ... `lpszErrorTag` contains the name of a tag with the String data type. In order to respond to the return value, you have to configure a function that is triggered with the cycle "To change" at a value change of the error tags. The error tag should also be used to prevent further function calls or the operation of a button, for example, as long as the error tag has the value "RUNNING".

lpszErrorTag

Name of a tag of the String data type. If the tag is not required, NULL can be transferred as the parameter. If required, the tag name can include a `ServerPrefix`.

The value of the error tag is changed as follows:

- When the asynchronous part is started, the value of the error tag is set to "RUNNING".
- When the asynchronous part is completed without an error, the value of the error tag is set to "OK".
- When the asynchronous part was terminated with an error, the error tag contains a multi-line string whose lines are separated by a linefeed character ('\n').

In the case of an error, the error tag has the following structure:

- Line 1: "ERROR"
- Line 2 - Line 6: Decimal numbers, data type: 32 bits unsigned; DWORD
- Line 7: Error text

Error text

When the asynchronous part was terminated with an error, the error tag contains a multi-line string whose lines are separated by a linefeed character ('\n'). The seventh line contains one of the following error texts:

IDS_E_IS_TIA_PROJECT	KOPAPI: This function cannot be used in a TIA Portal project.
IDS_E_NO_TIA_PROJECT	KOPAPI: The function call is disabled because no TIA Portal project is open!
IDS_E_TIAPORTAL_UNKNOWN_FLAGS	dwFlags contains an undefined value.
IDS_E_TIAPORTAL_ERRORTAG_NOT_EXIST	The error tag [%s] does not exist.
IDS_E_TIAPORTAL_PREVIOUS_CALL_IS_RUNNING	The previous call is still running (RUNNING). Please terminate it first.
IDS_E_TIAPORTAL_CANNOT_WRITE_ERRORTAG	The error tag [%s] cannot be written.
IDS_E_TIAPORTAL_COMACCESS_REGIS- TERPS_FAILED	No connection to TIA Portal possible.
IDS_E_TIAPORTAL_CANNOT_START_PORTAL	TIA Portal cannot be started.
IDS_E_TIAPORTAL_CANNOT_SEARCH_STAR- TED_PORTAL	A search for a started Portal is not possible.
IDS_E_TIAPORTAL_NO_PORTAL_STARTED	A Portal could not be started.
IDS_E_TIAPORTAL_EXCEPTION_SYNC_PART	Exception in synchronous processing part.
IDS_E_TIAPORTAL_EXCEPTION_ASYNC_PART	Exception in asynchronous processing part.
IDS_E_TIAPORTAL_NOT_INSTALLED	No TIA Portal installed.
IDS_E_TIAPORTAL_PROJECT_CANNOT_OPEN	Project [%s] cannot be opened.
IDS_E_TIAPORTAL_AL- READY_OPENED_WITH_OTHER_PROJECT	TIA Portal is opened with another project.
IDS_E_TIAPORTAL_CREATECOMMAND	CreateCommand error.
IDS_E_TIAPORTAL_COMMAND_ADDARGU- MENT	Command AddArgument error.
IDS_E_TIAPORTAL_EXECUTECOMMAND	Serious error in ExecuteCommand.
IDS_E_TIAPORTAL_COMMAND_ERROR	TIA project command error: [%s, %ld].
IDS_E_TIAPORTAL_COMMAND_UNKNOWN	TIA project unknown error: [%s, %ld].

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