Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.
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<td></td>
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</tr>
</tbody>
</table>
1.1 Installation Guide

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.
## 1.2 Scope of delivery

### Components supplied

WinCC V7.4 SP1 is available as a basic package or upgrade package and as a download package "OSD" (Online Software Delivery).

You will receive the following components:

<table>
<thead>
<tr>
<th>Components</th>
<th>Basic / Upgrade / Download Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>WinCC V7.4 SP1 DVD:</td>
<td>X</td>
</tr>
<tr>
<td>• WinCC V7.4 SP1</td>
<td></td>
</tr>
<tr>
<td>• WinCC/WebNavigator V7.4 SP1</td>
<td></td>
</tr>
<tr>
<td>• WinCC/DataMonitor V7.4 SP1</td>
<td></td>
</tr>
<tr>
<td>• WinCC/Connectivity Pack V7.4 SP1</td>
<td></td>
</tr>
<tr>
<td>• WinCC/Connectivity Station V7.4 SP1</td>
<td></td>
</tr>
<tr>
<td>• SQL Server 2014 SP2 for WinCC V7.4 SP1</td>
<td></td>
</tr>
<tr>
<td>• SIMATIC Logon V1.5 SP3</td>
<td></td>
</tr>
<tr>
<td>• Automation License Manager V5.3 SP3</td>
<td></td>
</tr>
<tr>
<td>• Simatic NCM PC V5.5 SP3</td>
<td></td>
</tr>
<tr>
<td>• AS-OS-Engineering V8.2</td>
<td></td>
</tr>
<tr>
<td>SIMATIC NET DVD:</td>
<td>X</td>
</tr>
<tr>
<td>• Simatic Net V14</td>
<td></td>
</tr>
<tr>
<td>Required licenses</td>
<td>X</td>
</tr>
<tr>
<td>Certificate of License</td>
<td>X</td>
</tr>
</tbody>
</table>

1) Refer to the software requirements in the installation notes and release notes.
2) When you install SIMATIC Logon, a computer restart may be necessary.
3) Simatic NCM PC is not released for all operating systems. If you are using STEP 7 and SIMATIC Manager, use Windows 7 or Windows Server 2008 R2.
4) When you use WinCC in integrated operation, use the latest released Simatic Net version. Note the software requirements in the Simatic Net documentation. If you use Windows Server 2016, you need at least Simatic Net V14 SP1.

### Note

**Print Installation Notes**

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

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

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

### Communication drivers

The following table lists the communication drivers included in the package.

<table>
<thead>
<tr>
<th>Communication drivers</th>
<th>Additional license</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPC</td>
<td>No</td>
</tr>
<tr>
<td>Allen Bradley - Ethernet IP</td>
<td>No</td>
</tr>
<tr>
<td>Mitsubishi Ethernet</td>
<td>No</td>
</tr>
<tr>
<td>Modbus TCP/IP</td>
<td>No</td>
</tr>
<tr>
<td>PROFINET DP</td>
<td>No</td>
</tr>
<tr>
<td>PROFINET FMS</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC 505 TCPIP</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC S5 Ethernet Layer 4</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC S5 Profibus FDL</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC S5 Programmers Port AS511</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC S5 Serial 3964R</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC S7 Protocol Suite</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC S7-1200, S7-1500</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC TI Ethernet Layer 4</td>
<td>No</td>
</tr>
<tr>
<td>SIMATIC TI Serial</td>
<td>No</td>
</tr>
<tr>
<td>SIMOTION</td>
<td>No</td>
</tr>
<tr>
<td>System Info</td>
<td>No</td>
</tr>
<tr>
<td>WinCC OPC UA server</td>
<td>No ¹)</td>
</tr>
</tbody>
</table>

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

### See also

- [Licenses and Licensing](Page 11)
- [WinCC Installation Requirements](Page 16)
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 products and functions

SIMATIC Process Historian

Note which functionality is supported by the SIMATIC Process Historian version that is used in each case. For additional information, refer to the documentation for the SIMATIC Process Historian.

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 the following entry you can call the compatibility tool and find additional information on the operation of the tool:

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 the installation of licenses as follows:

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

Licenses which are installed for use in WinCC are transferred from the storage medium to a local drive and are unregistered on the storage medium.

Note

Furthermore, the licensee confirms that the software (SW) contains licensed software by Microsoft Corporation or its subsidiaries. Thereby, licensee agrees to be bound by the terms and conditions of the appended license agreement between Microsoft SQL Server and end user, and to fulfill same.

Notes on license conditions

Please observe the enclosed license conditions, which are also displayed during the installation. You need V7.4 licenses for WinCC V7.4.

The SIMATIC WinCC software is copy-protected against unlicensed use. Additional information on licenses and license types may be found under "Licensing" in the WinCC Information System.

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

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 a license is only possible for the following licenses or licenses of the following options:

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

1.4 Licenses and Licensing

- WinCC/PerformanceMonitor
- SIMATIC Information Server

Other licenses cannot be cumulated.

Demo Mode

If a license is missing for one or several 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.

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.

To exit WinCC demo mode, install the required licenses.

Details on demo mode may be found in WinCC Information System under "Licensing".

Microsoft SQL Server 2014

A license is necessary to use the Microsoft SQL Server database. This license is readily available in a licensed and proper installation of WinCC.

The licensed SQL server installed with WinCC may only be used in connection with WinCC. Its use for other purposes requires an additional license. These include, e.g.:

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

Uninstalling

After uninstalling WinCC, the "WinCC" SQL server instance must also be removed. Select "Control Panel" > "Software" and then select the "Microsoft SQL Server 2014" item for removal.

Installation of Licenses

You may use the Automation License Manager for installation of licenses. Licenses may be installed during installation of WinCC or after the fact. You will find the Automation License Manager in the Windows start menu in the "Siemens Automation" program group. An after-the-fact installation of a license will take effect upon restart of your computer.

For the installation of licenses, the following requirements must be met:

- 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 a non-compressed drive.
1.4 Licenses and Licensing

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

See also
- How to Perform an Upgrade Installation (Page 49)
- How to Perform an Uninstall (Page 46)
- How to Install Supplementary Components Later (Page 41)
- How to Install WinCC (Page 36)
- Microsoft SQL Server for WinCC (Page 25)
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

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.

Testing the validity of the licenses

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

![WinCC Information]

For this version of WinCC, the license data carrier must be available at the USB interface.

Connect the license data carrier with the USB interface or check your hardware.

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. Remove this WinCC version and obtain a legal, licensed version of WinCC V7.
If necessary, contact WinCC Support and provide the serial number of your software version:


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**

**Do not remove the "License Key USB Hardlock" dongle**

If you remove the dongle from the computer, an error message is generated and WinCC switches to Demo mode.

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.

**See also**

1.6 Installation Requirements

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

Windows operating system: Avoid changes in system

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 Windows Task Manager.
- Changes in Windows registry.
- Changes in 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 of 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.

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>To execute installation properly, restart the computer</td>
<td>The software installed on your computer requires a restart. Before WinCC can be installed, the computer should be restarted once.</td>
</tr>
<tr>
<td>This application requires VGA or any higher resolution</td>
<td>Check the settings of the connected monitor and upgrade the graphic card, if necessary.</td>
</tr>
<tr>
<td>You do not have administrator rights. Log on as administrator.</td>
<td>Administrator rights are required for the installation. Please log in to Windows again as a user with administrator rights.</td>
</tr>
</tbody>
</table>
**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 Windows again as 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 Windows installation CD. You can find detailed information in the section "Installing Microsoft Message Queuing".

See also

- Defining Access Rights in the Operating System (Page 28)
- Licenses and Licensing (Page 11)
- How to Adapt the Windows Security Policies (Page 33)
- How to Install MS Message Queuing (Page 35)
- Notes on Data and System Security (Page 26)
- Software Requirements for the Installation (Page 19)
- Hardware Requirements for the Installation (Page 17)
- Microsoft SQL Server for WinCC (Page 25)

1.6.2 Hardware Requirements for the Installation

**Introduction**

Certain hardware configuration conditions must be fulfilled for installation.

**Hardware Requirements**

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

To efficiently work 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.
## 1.6 Installation Requirements

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows 7 / Windows 8.1 (32-bit)</td>
<td>Dual core CPU</td>
<td>Multi core CPU</td>
</tr>
<tr>
<td></td>
<td>Client / single-user system 2.5 GHz</td>
<td>Client: 3 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Single-user system: 3.5 GHz</td>
</tr>
<tr>
<td>Windows 7 / Windows 8.1 / Windows 10 (64-bit)</td>
<td>Dual core CPU</td>
<td>Multi core CPU</td>
</tr>
<tr>
<td></td>
<td>Client / single-user system 2.5 GHz</td>
<td>Client: 3 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Single-user system: 3.5 GHz</td>
</tr>
<tr>
<td>Windows Server 2008 R2 / Windows Server 2012 R2 / Windows Server 2016</td>
<td>Dual core CPU</td>
<td>Multi core CPU</td>
</tr>
<tr>
<td></td>
<td>Client / single-user system / server: 2.5 GHz</td>
<td>Single-user system: 3.5 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Server: 3.5 GHz</td>
</tr>
<tr>
<td><strong>Work memory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows 7 / Windows 8.1 (32-bit)</td>
<td>Client: 1 GB</td>
<td>Client: 2 GB</td>
</tr>
<tr>
<td></td>
<td>Single-user system: 2 GB</td>
<td>Single-user system: 3 GB</td>
</tr>
<tr>
<td>Windows 7 / Windows 8.1 / Windows 10 (64-bit)</td>
<td>Client: 2 GB</td>
<td>4 GB</td>
</tr>
<tr>
<td></td>
<td>Single-user system: 4 GB</td>
<td></td>
</tr>
<tr>
<td><strong>Free storage space on the hard disk</strong></td>
<td>Installation:</td>
<td>Installation:</td>
</tr>
<tr>
<td>- for the installation of WinCC</td>
<td>• Client: 1.5 GB</td>
<td>• Client: &gt; 1.5 GB</td>
</tr>
<tr>
<td>- for working with WinCC</td>
<td>• Server: &gt; 1.5 GB</td>
<td>• Server: 2 GB</td>
</tr>
<tr>
<td>1) 2) Working with WinCC:</td>
<td>• Client: 1.5 GB</td>
<td>• Client: &gt; 1.5 GB</td>
</tr>
<tr>
<td></td>
<td>• Server: 2 GB</td>
<td>• Server: 10 GB</td>
</tr>
<tr>
<td></td>
<td>Archive databases may require additional memory.</td>
<td></td>
</tr>
<tr>
<td><strong>Virtual work memory</strong></td>
<td>1.5 x RAM</td>
<td>1.5 x RAM</td>
</tr>
<tr>
<td><strong>Color depth / Color quality</strong></td>
<td>256</td>
<td>Highest (32 Bit)</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>800 * 600</td>
<td>1920 * 1080 (Full HD)</td>
</tr>
</tbody>
</table>

1) Depending on project size and on the size of archives and packages.

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

3) Use the recommended value in the area "Total size of swap file for all drives" for "Size of swap file for a specific drive". Enter the recommended value in both the "Start size" field as well as in the "Maximum size" field.

**Note**

In the case of online configuration, the recommended requirements are valid as the minimum requirement.
Virtualization

The following virtualization systems are tested:

- Microsoft Hyper-V 2012 R2 / 2016
- VMware ESXi 6.0 / 6.5

Requirement

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

You can find additional information about virtual environments with WinCC at the following URL (entry ID=49368181):


See also

- Defining Access Rights in the Operating System (Page 28)
- Notes about Running the Software (Page 52)
- Notes on Data and System Security (Page 26)
- Software Requirements for the Installation (Page 19)
- Scope of delivery (Page 8)

1.6.3 Software Requirements for the Installation

Introduction

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

---

**Note**

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)
- 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:

Windows Server 2008 R2, 2012 R2 or 2016, uniformly Standard, Datacenter or Enterprise edition in each case.

Single-user systems and clients

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Configuration</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 7</td>
<td>Professional Service Pack 1</td>
<td>Standard installation</td>
</tr>
<tr>
<td></td>
<td>Enterprise Service Pack 1</td>
<td>32-bit and 64-bit</td>
</tr>
<tr>
<td></td>
<td>Ultimate Service Pack 1</td>
<td></td>
</tr>
<tr>
<td>Windows 8.1 (^1)</td>
<td>Pro</td>
<td>Standard installation</td>
</tr>
<tr>
<td></td>
<td>Enterprise</td>
<td>32-bit and 64-bit</td>
</tr>
<tr>
<td>Windows 10 (^1)</td>
<td>Pro</td>
<td>Standard installation</td>
</tr>
<tr>
<td></td>
<td>Enterprise</td>
<td>64-bit</td>
</tr>
<tr>
<td></td>
<td>Enterprise LTSB (Long-Term Servicing Branch)</td>
<td>If you are using Simatic Net, observe the information in the Simatic Net &quot;readme&quot; file.</td>
</tr>
<tr>
<td>Windows Embedded Standard 7</td>
<td>including Service Pack 1</td>
<td>Only in combination with SIMATIC IPC 4x7D and SIMATIC IPC 4x7E</td>
</tr>
</tbody>
</table>

\(^1\) Not approved for integrated operation in SIMATIC Manager. If you are using STEP 7 and SIMATIC Manager, use Windows 7 or Windows Server 2008 R2.

You can also run single-user systems and clients in WinCC multi-user systems on Windows Server 2008 R2 SP1 / 2012 R2 / 2016.
WinCC Server


<table>
<thead>
<tr>
<th>Operating system</th>
<th>Configuration</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Server 2008 R2</td>
<td>Standard Service Pack 1 Enterprise Service Pack 1</td>
<td>64-bit</td>
</tr>
<tr>
<td>Windows Server 2012 R2</td>
<td>Standard Datacenter</td>
<td>64-bit</td>
</tr>
<tr>
<td>Windows Server 2016</td>
<td>Standard Datacenter</td>
<td>64-bit</td>
</tr>
</tbody>
</table>

1) Not approved for integrated operation in SIMATIC Manager. If you are using STEP 7 and SIMATIC Manager, use Windows Server 2008 R2 SP1.

Note

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.

WinCC server with up to three WinCC clients

It is also possible to operate a WinCC Runtime server on the following operating systems if you are not running more than three clients:

- Windows 7
- Windows 8.1
- Windows 10

WinCC ServiceMode is not released for this configuration.

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 54)”. 

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:

- ;;?!"'`,~_ 
- + = / \ @ \* \# \$ \% \& \^ \ü 
- ()[]{}<> 
- Space character
Note the following:
- Only uppercase relevant
- The first character must be a letter.
- The first 12 characters of the computer name must be unique.

**Microsoft Message Queuing services**

WinCC requires Microsoft Message Queuing services. You can find detailed information in the section "Installing Microsoft Message Queuing".

**Microsoft .NET Framework**

Ensure that .Net Framework is installed before you install WinCC.

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Microsoft .NET Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 7</td>
<td>3.5</td>
</tr>
<tr>
<td>Windows 8.1 / Windows Server 2012 R2</td>
<td>4.5</td>
</tr>
<tr>
<td>Windows 10 / Windows Server 2016</td>
<td>4.6</td>
</tr>
</tbody>
</table>

**Internet Explorer - requirements**

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

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".

**Process communication driver**

To install the SIMATIC NET drivers, use the latest SIMATIC NET DVD.
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

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.

Open the "System properties" dialog in the Control Panel. Open the "Environment variables" dialog using the "Environment variables" button on the "Advanced" tab, and display the value of the "Path" system tag.

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

Requirements for the OPC UA WinCC channel

The WinCC OPC UA Configurator requires the Java Runtime Environment. Java Runtime be installed prior to the installation of WinCC V7.4.

To be able to work with the WinCC OPC UA Configurator, you need to download and install the latest JRE installation package. You can find the installation package on the Oracle homepage under:

- Link to Oracle download homepage (http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html)

Install the latest release of the variant suitable for your operating system in the 32-bit version, at least JRE 8.

You can find additional information about the WinCC OPC UA Configurator in the WinCC Information System under "Communication > OPC UA WinCC Channel > WinCC OPC UA Configurator".

You can find additional information on installation in the Product Support under entry number = "109482513"

Microsoft Internet Information Service (IIS)

Before installing the following components or options, you must first install the Microsoft Internet Information Service (IIS):

- WinCC OPC XML DA Server
- WinCC/DataMonitor
- WinCC/WebNavigator
- WinCC/WebUX

The IIS settings for the WinCC/DataMonitor, WinCC/WebNavigator and WinCC/WebUX options can be found in the respective installation notes.

WinCC OPC XML DA Server: Configuring the settings

In Windows Server 2008 R2 / 2012 R2 / 2016, configure the settings in the Server Manager using the "Webserver (IIS)" role in the associated role services.

Select the following settings:

- Web management tools:
  - IIS management service
  - IIS management console
  - IIS management scripts and tools
  - Compatibility with IIS Metabasis and IIS 6 configuration
  - Compatibility with WMI for IIS 6
- WWW Services > Common HTTP Features or Shared HTTP Features:
  - Standard document
  - Static content
- WWW services > Application development features:
  - .NET extendibility
  - ASP
  - ASP.NET
  - ISAPI extensions
  - ISAPI filters
- WWW Services > security:
  - Request filtering
  - Basic Authentication
  - Windows authentication
Note
Always install Microsoft Internet Information Service (IIS) with ASP.NET and ASP
Always install ASP.NET and ASP when you install the Microsoft Internet Information Service (IIS).

WinCC OPC XML DA Server: Firewall settings
The web service of the WinCC OPC XML DA server communicates over port: 80 (HTTP).
Make sure that the firewall rule "WWW services (HTTP)" is selected and activated for the required network areas.

See also
Microsoft SQL Server for WinCC (Page 25)
Oracle homepage (http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html)

1.6.4 Microsoft SQL Server for WinCC
WinCC requires Microsoft SQL Server 2014 Service Pack 2 in the 32-bit version.
SQL Server is included automatically in the WinCC installation.

Microsoft SQL Server 2014 SP2 32-bit
The corresponding user rights must be set up for accessing the SQL Server data. Read the notes in the section "Defining access rights in the operating system (Page 28)".
Note the information on licensing of the SQL Server under "Licenses and licensing (Page 11)". 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 SQL Server Express

SQL-Express is installed in the following cases:

- Installation of "WinCC client"
- Installation of the WinCC V7 demo version

Requirement for the installation of SQL-Express

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

See also

- Defining Access Rights in the Operating System (Page 28)
- Software Requirements for the Installation (Page 19)
- How to Perform an Uninstall (Page 46)
- Licenses and Licensing (Page 11)
- Access rights in the operating system (Page 28)

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 additional information in the WinCC Release Notes under "Notes on Operation > Windows Operating System"

Preventing Access to the Operating System Layer in Runtime

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

Protect the corresponding function by executing a Permission Check via the User Administrator to prevent unauthorized access to the operating system.

Preventing access to the Windows toolbar

You can use the computer properties to prevent the Windows taskbar from being displayed in Runtime. Open the "Parameters" tab in the "Computer properties" dialog and deactivate all the shortcut keys in the "Disable Keys" area.
In addition, deactivate the "Keep the taskbar on top of other windows" setting in 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:


**Shortcut key <Ctrl+Esc>**

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

<table>
<thead>
<tr>
<th>Keyboard shortcut</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Windows key+U&gt;</td>
<td>System utility program manager</td>
</tr>
<tr>
<td>Press &lt;Shift&gt; five times</td>
<td>Locking function</td>
</tr>
<tr>
<td>Press &lt;Shift right&gt; for eight seconds</td>
<td>Impact delay</td>
</tr>
<tr>
<td>&lt;Alt left+Shift left+Num&gt;</td>
<td>Keyboard mouse</td>
</tr>
<tr>
<td>&lt;Alt left+Shift left+Print&gt;</td>
<td>High contrast</td>
</tr>
</tbody>
</table>

**Note**

The functions can be configured using the Windows Control Panel.

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

**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:


**See also**

- [Notes about Running the Software](Page 52)
- [How to Adap the Windows Security Policies](Page 33)
- [Defining Access Rights in the Operating System](Page 28)
- [How to Install WinCC](Page 36)
1.6.6 Access rights in the operating system

1.6.6.1 Defining Access Rights in the Operating System

Introduction

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

- 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 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 Windows User and Group Administration:

- "SIMATIC HMI"
  All users must be members of the "SIMATIC HMI" user group. These members may create local projects, and may 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 carries out the WinCC installation and the local administrator are members of 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.

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: 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:
  - Windows group "User"
  - User group "SIMATIC HMI"
- Procedure:
  Add the user to the "SIMATIC HMI" user group and, at a minimum, to the 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
- Retrieval
- 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 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 WinCC channel "System Info"

Role: Operator

Authorization: System monitor user

Procedure:
Into the Windows group "System monitor user", accept all users who require the following system information of the WinCC channel "System Info":
- CPU load
- Status of the export file

Explanation:
Users with Windows standard user rights do not have access to certain system information.
1.6.6.2 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 Windows.
2. Select the entry "Local Users and Groups > Users" in the navigation window.
   All local users are displayed in the data window.
3. Open the "New User" dialog via the shortcut menu.
   Create a user account with the same login for each user who is to have access to WinCC.
4. Select the entry "Local Users and Groups > Groups" in the navigation window.
   All groups are displayed in the data window.
   Select the "SIMATIC HMI" group.
5. Using the shortcut menu, open the "Add Member" dialog and include those users as members of the "SIMATIC HMI" user group.

1.6.6.3 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.
1.6 Installation Requirements

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 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.

1.6.6.4 Release existing project for "SIMATIC HMI" user group

Introduction

You must first remove the existing release of the project directory if the user group "SIMATIC HMI" has to access an existing user group. Then the project is released again while opening WinCC Explorer.

Procedure

1. Open the workstation administration under 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 enable through the "Cancel Share" pop-up 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 unlocked by WinCC must not be modified.
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.
- In the case of Windows 7 and Windows Server 2008 R2, the use of the Windows function "Fast User Switching" is not permitted for WinCC.

Procedure for Windows 7 / Windows Server 2008 R2

1. In the Windows Start menu, select "Programs > Accessories > Execute".
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.
5. In the left section of the window under "Policy for local computer", select "Computer Configuration > Administrative Templates > System > Login".
6. Enable the option "Hide entry points for Fast User Switching". After you have logged off, the "Fast User Switching" function is no longer available in the Windows Start menu.

See also

- Notes on Data and System Security (Page 26)
- Defining Access Rights in the Operating System (Page 28)
- Software Requirements for the Installation (Page 19)
- WinCC Installation Requirements (Page 16)
1.7 Installing WinCC

1.7.1 Installing WinCC

Introduction

This section describes the installation of WinCC.
Install MS Message Queuing before you install WinCC.

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 V7 and WinCC Fileserver V7 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 48)
How to Install Supplementary Components Later (Page 41)
How to Install WinCC (Page 36)
How to Install MS Message Queuing (Page 35)
Hardware Requirements for the Installation (Page 17)
1.7.2 How to Install MS Message Queuing

Introduction

WinCC implements the Message Queuing services from Microsoft. It is a component part of the operating system. MS Message Queuing is however not included in the standard Windows installation and must be installed separately if required.

The Windows installation CD is required to complete the installation.

Note

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 2014 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.

Procedure - Windows 7

1. In the operating system Start Menu, open "Control Panel > Programs and Functions".
2. Click the "Enable/Disable Functions" button on the left menu bar. The "Windows Function" dialog opens.
3. Select the "Microsoft Message Queue (MSMQ) Server" component.
4. Activate the "Microsoft Message Queue Server Core" option.
5. Deactivate the subsidiary components.
6. Confirm with "OK".

Procedure - Windows 8.1

1. Go to "Control Panel > Programs and Features".
2. Click the "Turn Windows features on or off" button on the left menu bar. The "Windows Features" dialog opens.
3. Select the "Microsoft Message Queue" component.
4. Activate the "Microsoft Message Queue Server Core" option.
5. Deactivate the subsidiary components.
6. Confirm with "OK".
Procedure - Windows 10
1. Go to "Control Panel > Programs and Features".
2. Click the "Turn Windows features on or off" button on the left menu bar. The "Windows Features" dialog opens.
3. Activate the "Microsoft Message Queue (MSMQ) server" component.
   The "Microsoft Message Queue (MSMQ) Server Core" entry is selected.
   The subcomponents remain disabled.
4. Confirm with "OK".

Procedure - Windows Server 2008 R2
1. Start the Server Manager.
2. Right-click on "Features" in the navigation area and select "Add features".
3. Activate the "Message Queuing" option, and under it also the "Message Queuing Services" and "Message Queuing Server" options.
4. Click "Install".

1. Start the Server Manager.
2. Click on "Add roles and features". The "Add Roles and Features Wizard" window opens.
3. Click "Server selection" in the navigation area. Ensure that the current computer is selected.
4. Click "Features" in the navigation area.
5. Activate the "Message Queuing" option, and under it also the "Message Queuing Services" and "Message Queuing Server" options.
6. Click "Install".

See also
How to Install WinCC (Page 36)
WinCC Installation Requirements (Page 16)

1.7.3 How to Install WinCC

Introduction
This section describes how to install and run WinCC.
The components already installed are displayed during setup. The following icons are used:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>Current version of program is installed.</td>
</tr>
<tr>
<td>⬆</td>
<td>Program is being updated.</td>
</tr>
<tr>
<td>⚠</td>
<td>Program setup conditions are not met. Click the symbol for more detailed information.</td>
</tr>
<tr>
<td>□</td>
<td>Program can be selected.</td>
</tr>
<tr>
<td>✔</td>
<td>Program selected for installation.</td>
</tr>
<tr>
<td>□</td>
<td>Program cannot be selected (due to dependence on other programs).</td>
</tr>
<tr>
<td>✔</td>
<td>Program selected for installation (cannot be deselected).</td>
</tr>
</tbody>
</table>

**Scope of Installation**

During custom installation of WinCC, you can choose between the following variants:

<table>
<thead>
<tr>
<th>Variant</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical</td>
<td>WinCC Runtime, WinCC CS, Basic Process Control, SQL Server</td>
</tr>
<tr>
<td>Complete</td>
<td>&quot;Typical&quot;, including: OPC servers, SmartTools</td>
</tr>
<tr>
<td>Expert mode</td>
<td>Custom installation: You can select or deselect individual components in &quot;WinCC Expert&quot;</td>
</tr>
<tr>
<td>File server</td>
<td>WinCC Fileserver, SQL Server</td>
</tr>
<tr>
<td>WinCC client</td>
<td>WinCC Runtime, WinCC CS, Basic Process Control, SQL Express</td>
</tr>
</tbody>
</table>

1) If you are installing the "WinCC Client", you need an "RT Client" or "RC Client" client license.

You can also install or remove components and languages at a later time. Read the sections "How to perform a supplementary installation" and "How to perform a supplementary installation of languages" for more on this.

The required drive space depends upon the installed components. An estimated value is shown in the status bar.
Installation of WinCC Options

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

The documentation for some of the options will be available only if the concerned option package is installed.

Automatic Migration when a WinCC Project of a Previous Version is Opened

When you open a project that was created with a version older than WinCC V7.4, the configuration data and Runtime data are automatically migrated. Convert the pictures and libraries with the Project Migrator or manually via the Graphics Designer.

You can find detailed information about migration in the WinCC Information System under "First Steps > Migration".

Requirements

- Make sure that no other setup is running on the computer at the same time, for example, a Windows update.

- You need local administrator rights to install WinCC. Information on user rights, which is necessary for the operation of WinCC, is located in section "Instructions for Security of Data and System".

- The computer name may only contain permissible characters.

- The Windows component "MS Message Queuing" services must have been installed.

- The security policies must be adapted under Windows.

- No manually created SQL server entity with the name "WinCC" may be installed.

- The storage medium with the licenses is still not to be connected with the installation computer.

- If you want to use the OPC-XML-DA-Server from WinCC, the Microsoft Internet Information Service (IIS) must be installed before installing the OPC-XML-DA-Server.

WinCC is released for the following operating system languages: English, German, French, Italian, Spanish, Chinese simplified (PRC), Chinese traditional (Taiwan), Japanese, Korean and multi-lingual operating system.

Note

An error message is output if you run WinCC Setup without having the administrator rights, or if other setup conditions are not met. You can find additional information on error messages under "WinCC Installation Requirements (Page 16)".

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 program Setup.exe on the DVD.

2. Follow the on-screen instructions.

   Read the License Agreement and the Open Source License Agreement.
3. Select the languages you want to install.
   You may install other languages at a later time.

4. Select "Install" as the setup type.
   If an older WinCC version is found, you can also activate the "Update" setup type. With this setup type, it is not possible to select additional products to be installed.

5. Select the setup mode.

6. In Package installation, select the Program package "WinCC Installation".
   - If you also want to install WinCC options, select the corresponding program packages.
   - Select "WinCC Client Installation" if you only want to install the WinCC client.
   - Select the scope of your installation in User-defined installation.
   The components to be installed are highlighted in Setup. Click on "Help" for a description of the displayed symbols. Click on "Readme" to open the Information System.

7. Read 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.

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.

10. You can transfer the product License Keys after having installed 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 the licenses**

   The license keys will not be transferred automatically. You will have to transfer missing license keys during or after installation with Automation License Manager.

11. Restart the computer to conclude the installation.
New entries in the "Siemens Automation" program group

After the installation of WinCC, you will find the new folders in the "Siemens Automation" program group.

- Starting WinCC Explorer:
  - WinCC Explore

- Tools for working with WinCC:
  - Channel Diagnosis
  - Cross Reference Assistant
  - Dynamic Wizard Editor
  - Project Duplicator
  - Project Migrator
  - Tag Export Import
  - WinCC Documentation Viewer
  - WinCC Tag Simulator

- Documentation for WinCC in the WinCC Information System:
  - WinCC Information System in the language in which WinCC was installed:
    WinCC Information System
  - Documentation in all languages:
    Documentation
  - Print versions of the WinCC Information System:
    PDF files in the installation path under "WinCC > Documents"

- Management of the licenses:
  - Automation License Manager
  - License Analysis

- Security Controller for display of the customized security settings:
  - Security Controller

- Overview of the installed SIMATIC software and the components:
  - Inst. Software

See also

Upgrading WinCC (Page 48)
Notes on Data and System Security (Page 26)
Defining Access Rights in the Operating System (Page 28)
How to Install MS Message Queuing (Page 35)
How to Adapt the Windows Security Policies (Page 33)
Notes about Running the Software (Page 52)
1.7.4 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"
1.7.5 How to Install Supplementary Languages

Introduction

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

Procedure

1. Open the "Programs and Features" entry in the Control Panel.
2. Select "SIMATIC WinCC Runtime V7.4 SP1" and click the "Change" button. The WinCC Setup program opens.
3. Select the desired languages.
4. When prompted, insert the WinCC product DVD in the DVD drive. Once the start page of the DVD is opened via 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 V7.4 SP1" and click the "Change" button. Repeat steps 3 to 5 for WinCC CS. Repeat this procedure for any additionally installed components and options.

1.7.6 Configuring automatic installation

1.7.6.1 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. 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.

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.

1.7.6.2 Calling Record function

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.

Requirement

- You need administrator rights on your PC.
**Procedure**

1. In the Windows Start menu, enter the following command line in the "Run" field:
   - `<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.

2. Select the desired language and click "OK".
   The "Record function" dialog is displayed.

3. Activate the Record function.

4. Select the path in which you want to create the "Ra_Auto.ini" control file and confirm with "Next".

5. 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.

**1.7.6.3 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.

**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`
1.8 How to Perform an Uninstall

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 via 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 program Setup.exe 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 Windows "Control panel" under the Start menu.
2. Double-click on the "Programs" icon.
3. Click the "Change or Remove Programs" icon.
4. Select the desired entry and click "Remove" or "Change".
   All entries of the installed WinCC components start with the prefix "SIMATIC WinCC". Remove any WinCC options that may have been installed before you remove the WinCC version.

Microsoft SQL Server 2014

After uninstalling WinCC, the "WinCC" SQL server instance must also be removed. Select "Control Panel" > "Programs and Functions" and then select the "Microsoft SQL Server 2014" item for removal.

The use of the Microsoft SQL Server 2014 is only permitted when 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 will need to remove both of these programs. Open "Control Panel" > "Add/Remove Programs" and then select the corresponding item for removal.
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 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): 1024 KB (default setting: 512 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 adapt these settings in the Windows Event Viewer yourself.

See also

- How to Perform an Upgrade Installation (Page 49)
- How to Install WinCC (Page 36)
- How to Install Supplementary Components Later (Page 41)
- Licenses and Licensing (Page 11)
- Microsoft SQL Server for WinCC (Page 25)
1.9 Upgrading WinCC

1.9.1 Upgrading WinCC

Introduction

You can upgrade to WinCC V7.4 from version WinCC V6.2 SP3 and higher by means of an upgrade installation.

Proceed as described in "Upgrading an installation" section.

Note

Restart PC before installing the update

Restart the PC before commencing installation of the update to WinCC V7.4.

Requirements for the upgrade

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

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


Upgrading WinCC clients

WinCC clients can only be upgraded starting with WinCC V7.2.

To upgrade a WinCC client with a version prior to WinCC V7.2, follow these steps:

1. Perform an upgrade installation to WinCC V7.3.
2. Perform an upgrade installation from WinCC V7.3 to WinCC V7.4.

If you want to upgrade a version prior to V7.2 to V7.4, the SQL Standard Server is installed instead of SQL Express. This installation displays the license requiring acknowledgment message on the WinCC client.

Information on migrating projects

When you open a project of a previous version in WinCC V7.4, you are prompted to migrate it. 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 the migration of projects see section "Migration".

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

You need to upgrade licenses of WinCC prior to V7.4 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 49)


1.9.2 How to Perform an Upgrade Installation

Introduction

If you currently have WinCC V6.2 SP3 or higher installed on your system, you can perform an upgrade installation.

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 WinCC V7.4.
However, performance is reduced if the amount of data is increased too much. If it is expected that the data volume will increase, upgrade the hardware in good time.

**Note**

**Restart PC before installing the update**

Restart the PC before commencing installation of the update to WinCC V7.4.

**Requirements for the upgrade**

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

Additional information on migration of WinCC versions V4 or higher is available under the following URL (entry ID=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 commencing installation of the update to WinCC V7.4.

**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 WinCC V7.4. Proceed as described in the section "How to install WinCC".
   You need the storage medium that contains the licenses for WinCC V7.4. 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

- Licenses and Licensing (Page 11)
- How to Install WinCC (Page 36)
- How to Perform an Uninstall (Page 46)
- Introduction (Page 135)

1.10 Notes about Running the Software

Introduction

For trouble-free operation and optimal performance of WinCC, observe the notes on operation under 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"
  This section includes information on compatibility and on use of virus scanners.

- "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.

- "Configurations > Multi-User Systems > Quantity Structures and Performance"
  The notes on configuration in this section apply to all project types.
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.
2.2 Notes on operation

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. Additional information is available in the section "Working with Projects > Making Runtime Settings > Impact of External Applications on Runtime".

Compatibility

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


Use of virus scanners

The following virus scanners have been released for use as of WinCC V7.4:

- Trend Micro "OfficeScan" Client-Server Suite V11.0
- Symantec Endpoint Protection V12.1 (Norton Antivirus)
- McAfee VirusScan Enterprise V8.8
- Windows Defender (version contained in the operating system)

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
  In WinCC V7.x, the local Windows firewall can be programmed with 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 the system PCs, for e.g. during a maintenance interval.

- Automatic scan
  During automatic scan it is enough to just scan the incoming data traffic.
Scheduled Scan
You are not permitted to run a scheduled scan in runtime.

Pattern update
Pattern update of virus scan clients (system PCs being checked for viruses) is done by the higher-level virus scan servers (the system PC that centrally manages the virus scan clients).

Dialogs
To avoid interfering with 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 e-mail scan except on the WinCC engineering station that receives e-mail.

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. Screensavers which no longer release parts of the working memory, continuously reduce the usable working memory.

The Windows "Logon screen saver" can be used.

See also
Software Requirements for the Installation (Page 19)

2.2.2 Defining Access Rights in the Operating System

Introduction

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

- 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 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 Windows User and Group Administration:

- "SIMATIC HMI"
  All users must be members of the "SIMATIC HMI" user group. These members may create local projects, and may 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 carries out the WinCC installation and the local administrator are members of 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.

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: 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:
  - Windows group "User"
  - User group "SIMATIC HMI"
- Procedure:
  Add the user to the "SIMATIC HMI" user group and, at a minimum, to the 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
  - Retrieval
  - 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 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 WinCC channel "System Info"
- Role: Operator
- Authorization: System monitor user
- Procedure:
  Into the Windows group "System monitor user", accept all users who require the following
  system information of the WinCC channel "System Info":
  - CPU load
  - Status of the export file
- Explanation:
  Users with Windows standard user rights do not have access to certain system information.
2.2.3 Windows Operating System

General information

Microsoft security updates and patches

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

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


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 interface of WinCC under a 64-bit operating system, you must adhere to the following:

- 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 compiles as 32-bit applications. With "x86" and not with "AnyCPU".
- C++ applications cannot be compiled as 64-bit applications.

Preventing access to 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 Windows selection dialog from opening. Deactivate the "Help available during runtime" option in the "Project properties" dialog in the "Options" tab.

Displaying the Windows taskbar in runtime

You can use the computer properties to prevent the Windows taskbar from being displayed in runtime. Open the "Parameters" tab in the "Computer properties" dialog and disable the option "Disable shortcut keys for operating system access" in the "Disable Keys" area.

In addition, deactivate the "Keep the taskbar on top of other windows" setting in Windows.
If you disable the <CTRL+ESC> shortcut key, the following shortcut keys are also disabled in runtime:

<table>
<thead>
<tr>
<th>Keyboard shortcut</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Windows key+U&gt;</td>
<td>System utility program manager</td>
</tr>
<tr>
<td>Press &lt;SHIFT&gt; five times</td>
<td>Locking function</td>
</tr>
<tr>
<td>Press &lt;SHIFT right&gt; for eight seconds</td>
<td>Impact delay</td>
</tr>
<tr>
<td>&lt;ALT left+SHIFT left+NUM&gt;</td>
<td>Keyboard mouse</td>
</tr>
<tr>
<td>&lt;ALT left+SHIFT left+PRINT&gt;</td>
<td>High contrast</td>
</tr>
</tbody>
</table>

The functions can be configured using the 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. You must install Microsoft hotfix KB2516889 when using Windows 7 SP1 (64-bit) and Windows Server 2008 R2 SP1 to prevent access to the operating system with the shortcut keys for enabling high-contrast mode:

- Internet: Microsoft hotfix KB2516889 ([http://support.microsoft.com/kb/2516889](http://support.microsoft.com/kb/2516889))

Do not use the "On-screen Keyboard" enabled by Windows

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

Do not specify print to file as standard printing

Do not set the print to file as standard printing procedure in the Windows operating system. This prevents the Windows dialog for saving the file from opening when printing from WinCC.

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, deactivate the Windows group guideline:
  To open the Microsoft "Group Policy Object Editor", enter "Gpedit.msc" in the search field. Deactivate the shortcut menu in the Group Policy "User configuration\Administrative templates\Windows components\Internet Explorer\Browser menus".

Preventing access to Windows 7/Windows Server 2008 in runtime

Disabling shortcut keys

If you would like to disable shortcut keys in Windows 7 or Windows Server 2008, you must adjust 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:

Without this adjustment, it is generally not possible to disable keys in Windows 7 and Windows Server 2008. Users can then use the shortcut key <Ctrl+Alt+Del> in WinCC Runtime to perform all related actions, e.g., lock computer, change user, log off, change password, start Task Manager.

**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 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 computers that do not have an Internet connection.

**See also**

- Internet: Microsoft hotfix KB2516889 [http://support.microsoft.com/kb/2516889](http://support.microsoft.com/kb/2516889)

### 2.2.4 Database System

**Information on DB.dll**

DB.dll is an ODK component for accessing databases via C API functions. The functionality is no longer supported for use with WinCC. Do not develop new applications with the database access layer DB.dll from WinCC.

Instead, use the following functions offered by Microsoft:

- Use ADO.NET for .NET-based applications. The database interface of .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 implements 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.

In order to reinstall the WinCC instance, both WinCC and the SQL server must be removed and installed again.

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 installation.

Manual detachment of WinCC project databases

A system property in Microsoft SQL server can bring about changes to the NTFS authorizations when you detach the WinCC project database.

If a WinCC database remains attached after you have closed a WinCC project or if you have manually attached the WinCC database, you always need 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.

2.2.5 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 Windows cluster technology

WinCC cannot be used on systems implementing 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 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 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.

**Use of WinCC within a domain**

If problems occur accessing the 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.
Information for using routers and firewalls

Using routers

WinCC V7 can also be used 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 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
Please note the following:
Prevent damaged files during power outages

If a power failure occurs while using 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.
2.3 Notes on WinCC

2.3.1 General information on WinCC and configurations

General information

WinCC Demo project
The WinCC demo project for WinCC V7.4 can be downloaded as a self-extracting ZIP file at:


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 the re-enter the passwords in the User Administrator.

Increasing password security
Make sure that the WinCC passwords meet the usual security guidelines, for example, mandatory use of capital letters and special characters, minimum number of characters.

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 actions to be programmed on individual graphic objects and even complete functions and global action scripts 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.

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

You can find additional 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 additional 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.

Installation of the examples projects
The supplied example projects are located on the WinCC DVD in the directory "Samples \WinCC".

Installing OPC XML DA Server on a WinCC system
Use the WinCC Product DVD if you want to add an OPC XML DA Server installation to a WinCC system. Do not install the application by means of Windows Control Panel.

Information for 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 corrupt 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.

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"

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.

See also

Internet: WinCC demo projects (https://support.industry.siemens.com/cs/products?search=demo&dtp=ExampleOfUse&o=DefaultRankingDesc&pnid=14866&lc=en-WW)
2.3.2 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 ActiveX control on the computer with WinCC, Web server or Web client and the installation using a plug-in, such as on a 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.).

The "Date/Time" data format is not available for I/O fields copied from WinCC < V7.3

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 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.

2.3.3 WinCC Runtime

Information on multi-user systems

Copying large amounts of data via the terminal bus
Copying large 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.

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: Time stamp for Alarm Logging and Tag Logging**

If messages are triggered by OPC tags, the message time stamp is used by the OPC server, comparably to chronological reporting.

For Tag Logging the time stamp is generated by the Tag Logging server.

**OPC UA: Displaying 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 the tags of the type "Raw data" are not shown as imported. The column "Access" is not available, although these tags have been correctly created in the Tag Management.

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

**OPC Data Access**

When running the OPC DA server on a WinCC client:
During the connection establishment of the OPC client, 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 XML Data Access**

**Display of newly created tags**
When you create new tag folders with new tags in Runtime in the WinCC project, the tag folders and the tags will not become visible on the OPC client until you have restarted WinCC Runtime on the OPC client system. Make sure that "OPCTags" are no longer open on the OPC client.

**Add Tags**
If you want to add tags with the OPC Item Manager, then WinCC Runtime will have to be enabled on the OPC server.

**Authentication method**
XML DA Web service is installed using WinCC Setup with the "Integrated Windows Authentication" authentication method. The WinCC OPC XML client supports this method. For this, the user account under which the OPC Client runs must be known to the XML server computer.

**Upgrade installation: Setting up a WinCC OPC XML server**
After an upgrade installation, in Computer Management, for the "Internet Information Services (IIS) Manager", under "Application Pools" for "WinCC-OPC-XML" you have to change the Microsoft .Net Framework version from V2.0 to V4.0.
OPC Historical Data Access

Return value OPC_E_MAXEXCEEEDED for archive access using OPC

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_MAXEXCEEEDED. 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.

2.3.4 Smart Tools

Notes on WinCC Configuration Tool and WinCC Archive Configuration Tool

WinCC Configuration Tool / WinCC Archive Configuration Tool: Replacement

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 Configuration Tool 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.

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.
WinCC Configuration Studio replaces the functionality of "Tag Export/Import"

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

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.

Information on the Tag Simulator

General information

The update time for tag values is one second. Any change will only become active when you are activating the functions.

A maximum of 300 tags can be configured.

2.3.5 Process communication

Information on the WinCC "SIMATIC S7 Protocol Suite" channel

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. The archive already contains the reset time period.

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):** 16-bit value (bit array) without sign; access: write and read
- **LStatus (loop status):** 16-bit value (bit array) without sign; access: Read ONLY

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

2.3.6 Remote access and Remote Desktop Protocol (RDP)

Remote maintenance of WinCC systems

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

Also see the information on remote configuration in the WinCC Information System under "Configurations > Multi-User Systems > Remote Configuration".

For Current note, see the following FAQ:

- **Entry ID 78463889** ([https://support.industry.siemens.com/cs/de/de/view/78463889](https://support.industry.siemens.com/cs/de/de/view/78463889))

<table>
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<th>NOTICE</th>
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<td><strong>Data loss after interruption of the remote desktop connection</strong></td>
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When the remote desktop connection was interrupted, for example, because the network cable was removed from the Remote Desktop Client, the archives and the OPC server, for example, will no longer receive values from the data manager.

This status will persist until the connection has been recovered, or until a timeout of 35 seconds has expired.

Use of RealVNC

Information on the use of "RealVNC" is available on the Internet on the Customer Support pages:


| No keyboard lock with RealVNC |

Note that the keyboard lock is not supported with "RealVNC". The keyboard lock is only in effect with a Remote Desktop Protocol connection.
Approved 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 approved scenarios.

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 additional parameters, enter the following command:
   - mstsc /?
Restrictions when using RDP

Observe the following restrictions:

- Not all services are started during operation via remote console. Start the WinCC project via the local user on the PC.
- The use in integrated operation in the SIMATIC Manager has not been approved.

Migration: 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.

See also

https://support.industry.siemens.com/cs/de/de/view/78463889
2.4 Notes on WinCC Redundancy

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.
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 PCS7 Engineering Station, the project 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 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 Windows.

Different buttons have English labels especially in the multi-lingual versions of 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

The project engineer my not create any tags with @ prefix. Only the WinCC PCS7 software can do this. 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.

DCF77 receiver DCFRS: Driver not released for Windows 8 and Server 2012

No driver is released for the DCFRS receiver under Windows 8.1 and Windows Server 2012 R2.

Smart card: Disabling the Plug&Play service

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

Since WinCC does not require a separate smart card driver, the "Plug&Play" service for smart cards is disabled.
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 due to authorization check:

- No Windows user 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 Windows user 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 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.
What's new in WinCC V7?

3.1 What's new in WinCC V7.4 SP1?

Introduction

WinCC V7.4 Service Pack 1 is a free upgrade for WinCC V7.4.

WinCC V7.4 SP1 guarantees compatibility with current SIMATIC products and Microsoft products. Service Pack 1 provides a series of functional enhancements as well as optimization of the existing software version.

Supported operating systems

Microsoft SQL Server 2014

Starting in WinCC V7.4 SP1, Microsoft SQL Server 2014 Service Pack 2 (32-bit) is required. The SQL server is included in the scope of delivery of the product.
Operating systems

WinCC V7.4 SP1 runs on the following operating systems:

- **WinCC client projects**
  - Windows 10 (Pro / Enterprise, 64-bit)
  - Windows 8.1 (Pro / Enterprise, 32-bit)
  - Windows 8.1 (Pro / Enterprise, 64-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 32-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 64-bit)

- **For WinCC single-user projects and client projects**
  - Windows 10 (Pro / Enterprise, 64-bit)
  - Windows 8.1 (Pro / Enterprise, 32-Bit)
  - Windows 8.1 (Pro / Enterprise, 64-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 32-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 64-bit)
  - Windows Server 2016 (Standard / Datacenter 64-bit)
  - Windows Server 2012 R2 (Standard / Datacenter 64-bit)
  - Windows Server 2008 R2 SP1 (Standard 64-bit)

- **For WinCC Server**
  - Windows 10 (Pro / Enterprise, 64-bit) *)
  - Windows 8.1 (Pro / Enterprise 64-bit) *)
  - Windows 7 SP1 (Pro / Enterprise 64-bit) *)
  - Windows Server 2016 (Standard / Datacenter 64-bit)
  - Windows Server 2012 R2 (Standard / Datacenter 64-bit)
  - Windows Server 2008 R2 SP1 (Standard 64-bit)

*) WinCC Server with up to three WinCC clients

Increased number of connections

Starting in WinCC V7.4 SP1, the following performance data applies:

- **SIMATIC S7-1200**: Up to 64 connections
- **SIMATIC S7-1500**: Up to 128 connections

The maximum possible number of connections is limited by the available system resources and their performance data, particularly CPU, RAM, Ethernet connection.
Additions to WinCC Explorer

You open the WinCC Explorer with the corresponding project by dragging and dropping the "<PROJECT>.MCP" project file on the "WinCCExplorer.exe" file or on the shortcut on the desktop.

Entries for the Graphics Designer

- The shortcut menu has been expanded with the commands "Password Protection" and "Save as Web-enabled".
- Additional picture types of the Graphics Designer are displayed.
- WinCC Information System > Creating Process Pictures > The Graphics Designer in WinCC Explorer

Additions to tag management

Comments on tags
You can add comments to tags. The comments are displayed for the tags in the tag selection dialog.

Prefixes and suffixes for specific connections
You can specify prefixes and suffixes for connections that are automatically assigned to the imported in WinCC process tags.

Graphics Designer: Enhancements and improved operation

- New smart object "SVG object" for inserting pictures with scalable vector graphics in a process picture.
- An SVG library has been added. The global library contains read-only SVG libraries with ready-made SVG graphics that are available as "zip" files. The project library enables a project-specific SVG library to be built.
- Objects and controls are inserted in the process picture using drag-and-drop.
- A style item can be inserted into one or more objects of the picture or process picture using drag-and-drop.
- The central color palette and global design settings in the Graphics Designer are opened via the "Tools" menu command.
- New buttons in the object palette and additions to the shortcut menu for sorting objects on the level.
- Multiple selection by clicking on the objects while holding down the <Shift> or <Ctrl> key or both keys simultaneously.
- Additional to the zoom palette.
- Additional fill patterns are available for objects.
After setting the picture, the picture appears in the picture window above the name and in the center the of preview.

You can have a separate tooltip text displayed for the customized object and for the contained objects in runtime. Select the "Tooltip text" attribute for the desired objects in the configuration dialog. Configure the tooltip texts in the "Object properties" window.

Additions to Alarm Logging

Messages of S7-1500 are integrated into the Alarm Logging and automatically updated

The controller alarms of the S7-1500 can be merged with all the texts in Alarm Logging. When controller alarms are changed, the messages are automatically updated.

Structuring of the data for the limit monitoring

The data for limit monitoring to be configured are now better integrated in the Configuration Studio.

Support of the central color palette for message colors

You can use the colors from the central color palette for the display of messages.

WinCC AlarmControl: "NOT" filter

In WinCC AlarmControl you can now also use the SQL statement "NOT" for filtering messages.

Additions to Tag Logging

Text tags can be archived in Tag Logging and displayed in WinCC Online Table Control and in the Data Monitor.

New "Text and Graphics Lists" editor in the Configuration Studio

A text list offers the option of assigning specific values of a tag to a text. The use of configured text lists facilitates the assignment of texts to specific values when configuring the "Text List" smart object in the Graphics Designer. For the "Text list" smart object, select one of the configured text lists with "Text list name" in the "Output/Input" property group.

You can use a graphic list to select the picture for configuration of the status display. Link any number of different states of an object to pictures and set the flashing frequency. In the Graphics Designer, select the "Status display" smart object in the configuration dialog from one of the configured graphic lists. The status list enters the selected graphic list.
Reports: Symbols in the tables of the WinCC controls are output

When runtime data is reported, the symbols in the tables of the corresponding WinCC controls are also output.

WinCC controls: Adapting the buttons and table elements

You can change the designs of the standard configuration of the WinCC controls and, for example, create customized symbols for table elements of the table controls. You choose the design of a control in the "Style" property in the configuration dialog of the control.

- WinCC Information System > Setting up a Message System > Display of Messages during Runtime > Configuring the AlarmControl > How to adapt table elements and buttons of the controls

Touch operation of process pictures

- Two-handed operation of process pictures is now available across picture windows.
- Supported gestures can be assigned to user-defined actions.

Basic Process Control (process control options)

"Picture Tree" editor

The Picture Tree Manager was integrated in the WinCC Configuration Studio and hereby renamed into "Picture Tree".

The administration of the hierarchical levels has been simplified and adapted to the table principle of WinCC Configuration Studio. Additional information is available in the documentation on the "Picture Tree" editor:

- WinCC Information System > Options > Options for Process Control > Picture Tree

OS Project Editor

- You can set the default message list in the "Message display" tab. The key of the selected message list is displayed in the first set of keys.
- Updating of the SVG libraries can be enabled in the "Basic data" tab.

User-defined trend groups

The "New Trend Group" dialog box was supplemented with the "private" setting. The trend group is only offered to the creator when this feature is enabled.

Installing and updating PH-Ready and IS-Ready

You can install "PH-Ready" and "IS-Ready" from the DVD "Process Historian / Information Server".
Offline data import from TIA Portal projects

Data records from TIA Portal projects, such as tag tables, messages and text lists, can now also be imported offline.

ODK extensions

Several functions and structures have been enhanced with regard to the following:

- Adding comments when configuring the tags
- Functions for editing tags, which enable the output of additional parameters, e.g.: VarWeighting and PLCVariableName
- Functions for determining names of the OPC namespace.
- Archiving text tags
- Configuring infotexts for the message and querying configured infotexts of the message
3.2 What is new in WinCC V7?

Introduction

The following section provides you with information in short form about the most important new features in WinCC V7.4 as compared to WinCC V7.3 SE incl. Update 1.

You can find detailed descriptions of the individual functions in the WinCC Information System.
3.3 Supported operating systems

Software requirements and supported operating systems

Microsoft SQL Server 2014

WinCC as of V7.4 requires Microsoft SQL Server 2014 Service Pack 1 (32-bit).
The SQL server is included in the scope of delivery of the product.

Operating systems

WinCC as of V7.4 runs on the following operating systems:

- WinCC client projects
  - Windows 10 (Pro / Enterprise, 64-bit)
  - Windows 8.1 (Pro / Enterprise, 32-bit)
  - Windows 8.1 (Pro / Enterprise, 64-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 32-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 64-bit)

- For WinCC single-user projects and client projects
  - Windows 10 (Pro / Enterprise, 64-bit)
  - Windows 8.1 (Pro / Enterprise, 32-bit)
  - Windows 8.1 (Pro / Enterprise, 64-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 32-bit)
  - Windows 7 SP1 (Ultimate / Professional / Enterprise, 64-bit)
  - Windows Server 2012 R2 (standard 64-bit)
  - Windows Server 2008 R2 SP1 (standard 64-bit)

- For WinCC Server
  - Windows 10 (Pro / Enterprise, 64-bit)
  - Windows 8.1 (Pro / Enterprise 64-bit)
  - Windows 7 SP1 (Pro / Enterprise 64-bit)
  - Windows Server 2012 R2 (standard 64-bit)
  - Windows Server 2008 R2 SP1 (standard 64-bit)

*) WinCC Server with up to three WinCC clients
3.4 Licensing

Improved license model for WinCC options

As of WinCC V7.4, a uniform license model applies to WinCC/DataMonitor, WinCC/WebNavigator and WinCC/WebUX:

- Licenses are available for 1 / 3 / 10 / 30 / 100 clients.
- The packages are version-independent and can be combined.

*) WinCC/DataMonitor: 1 / 3 / 10 / 30 clients

Combination of WebNavigator and WebUX licenses

If both WebNavigator and WebUX are used in the WinCC system, a WebNavigator license can also be assigned to a WebUX client.

This reduces the number of available WebNavigator licenses.

To guarantee access for key applications, you can use the following licenses:

- **WebNavigator diagnostics client**
  A "Diagnostics Client" license for the diagnostics client is only required on the client computer.
  As of WinCC V7.4 a license is no longer required a diagnostics server.

- **Reserved WebUX license**
  A WebUX license is reserved in the user administration for a specific user. This user always has guaranteed access to the WebUX server.

Upgrade licenses

The following upgrade licenses are available for upgrading to WinCC V7.4:

**WinCC Client**

Upgrade of a WinCC Runtime Client:

- Runtime Client Upgrade V7.x -> V7.4

Upgrade of a WinCC Runtime & Configuration Client:

- Runtime & Configuration Client Upgrade V7.x -> V7.4

**WinCC server / single-user system**

Upgrade WinCC Runtime 1):

- Runtime Client Upgrade V7.x -> V7.4

Upgrade WinCC Runtime & Configuration 1):

- Runtime & Configuration Upgrade V7.x -> V7.4
Remarks
1) Also contains the upgrades for the following products:
   - WinCC User Archives
   - WinCC Server
   - WinCC Redundancy
   - WinCC WebNavigator 2)
   - WinCC WebDiag Client
   - WinCC Load Balancing
   - WinCC Load Balancing step-up
   - WinCC DataMonitor 2)
   - WinCC Connectivity Pack
   - WinCC Connectivity Station
2) Licenses for 5 / 25 / 50 / 150 clients from versions up to V7.3 are retained.

See also
- Extended functionality for WinCC/WebNavigator (Page 107)
- Extended functionality for WinCC/DataMonitor (Page 109)
- Extended functionality for WinCC/WebUX (Page 110)
3.5 Simplified Runtime operation

Touch operation in Runtime
With WinCC V7.4, WinCC Runtime supports the usual gestures on a touch screen, for example:

- Change picture by swiping
- Zoom by dragging with two fingers (scaling)
- Open a shortcut menu with a long tap on an object or link

The WinCC controls feature a separate selection of gestures to support Control operation in Runtime, for example:

- Move axes and trends with one or two fingers
- Scale trend views with two fingers
- Keep pressed to display tooltips

A detailed description of the gestures that can be used is available under:

- "Working with WinCC > Creating Process Pictures > Process Pictures in Runtime > Touch Operation"

There you will also find a guide to configuring the two-hand operation of process pictures on a multitouch screen.

Sorting system dialog "Favorites" in Runtime
You can re-sort the displayed process pictures as required using drag-and-drop.

If you have specified a language-dependent display name for a process picture, this name is displayed in the system dialog.

Adjusting the size of the toolbar
You can change the size of the icons to facilitate operation in the toolbar of WinCC controls.

The "Key size in pixels" property allows a maximum magnification of ten times the original size of 28 pixels.
3.6 "SIMATIC S7-1200, S7-1500 Channel" channel DLL

With WinCC V7.4, process communication is extended via communication channel "SIMATIC S7-1200, S7-1500 Channel".

New functions support stable communication in your plant, for example tag synchronization with the controller and system diagnostics with WinCC SysDiagControl.

Increased number of connections

As of WinCC V7.4, the following performance data applies:

- SIMATIC S7-1200: Up to 32 connections
- SIMATIC S7-1500: Up to 128 connections

The maximum possible number of connections is limited by the available system resources and their performance data, particularly CPU, RAM, Ethernet connection.

Use of raw data tag communication

As of WinCC V7.4, the channel "SIMATIC S7-1200, S7-1500 Channel" supports the data type "Raw data tag".

Raw data tags as byte arrays are used for transferring user data blocks between WinCC and AS and handle only user data. The acyclic read service of the controller is supported for raw data tags, e.g. the tag request via C scripts.

A raw data tag as byte array is handled in the channel like a normal process tag that is addressed via address and length of the data area, for example DB1, DBB10, length 100 bytes.

Establishing or terminating a connection in Runtime

New, connection-specific tags provide you with the option of establishing or terminating channel connections during operation:

- The tag "@<ConnectionName>@ForceConnectionState" determines the connection status between a WinCC station and S7-1200 / S7-1500.
- The tag "@<ConnectionName>@ConnectionState" reports the current status of the connection.

Synchronizing WinCC tags with the controller

Configuration changes in the TIA Portal can, for example, lead to WinCC tags no longer matching the AS icons.

As of WinCC V7.4, the tags and settings are automatically synchronized after they have been downloaded from the controller or a file. The WinCC Tag Management compares the properties of the AS symbols with the tag properties in the WinCC project. Non-matching properties are marked in the tab "AS Symbols" and named in tooltips.

You can read in the AS configuration again using the "Update" function and restore the consistency.
System diagnostics with the WinCC SysDiagControl

The system diagnostics of WinCC V7.4 displays faults and errors of the controllers "S7-1200" and "S7-1500". The WinCC SysDiagControl hereby provides an overview of fast error localization. A message view of the controller allows you to navigate directly to the control for the diagnostics overview with detailed information.

The following views are available in the system diagnostics view:

- **Diagnostics overview:**
  Status of the controller for all available S7-1200/S7-1500 channels

- **Details view:**
  Information on the selected controller

- **Diagnostic buffer view:**
  Current data from the diagnostic buffer of the controller
What's new in WinCC V7?

3.6 "SIMATIC S7-1200, S7-1500 Channel" channel DLL

See also

Extended functionality for WinCC controls (Page 102)
Easier configuration with WinCC Configuration Studio

Efficient engineering with "drag-and-drop"

Configuring is even simpler and more convenient with the "WinCC Configuration Studio" of WinCC V7.4.

Drag the values into one of the editors using "drag-and-drop". The corresponding data is automatically created.

The extended "drag-and-drop" function offers the following options:

- Moving selected data within an editor and between editors
- Inserting tags created in Tag Management in the "Tag Logging" and "Alarm Logging" editors
- Configuring message groups in "Alarm Logging"
- Creating or extending a WinCC control with a connection to a tag or archive in the Graphics Designer
- Dragging selected data to editors outside of WinCC, for example MS Excel or WordPad

Mass data processing with "Find and replace"

The WinCC Configuration Studio supports you in configuring large data volumes:

The "Find and Replace" function expands selected data values in the table area with suffixes and prefixes. You can use this function, for example, to insert a server prefix in front of multiple tag names.

You can use this function in all fields that allow the entry of free text or numbers.

VBA in the WinCC Configuration Studio

WinCC V7.4 provides access to the VBA interface of the WinCC Configuration Studio. VBA allows you, for example, to automatically create tags in Tag Management and in Tag Logging.

You now have access to all editors in the Configuration Studio via VBA.
3.8 Extended functionality for WinCC Graphics Designer

Efficient engineering with "drag-and-drop"

WinCC V7.4 also provides additional support for configuring WinCC objects in Graphics Editor. With the extended "drag-and-drop" function, you can, for example, efficiently use a configuration environment with multiple monitors.

Inserting text
If you use drag-and-drop to insert a text in Graphics Designer, you can add one of the following objects:

- Static text
- Combo box
- List box
- Multi-line text
- Check box
- Radio box

Inserting tags
If you use drag-and-drop to insert a tag from the WinCC Configuration Studio into Graphics Designer, you can created one of the following objects with a tag connection:

- I/O field
- Status display
- Text list
- Combo box
- List box
- Bar
- WinCC OnlineTrendControl

Display in WinCC Explorer

WinCC Explorer offers the following new functions in the data window:

Process picture preview
A preview of the configured process pictures is displayed in the "Tiles" view.

Password protection of process pictures
Process pictures that are protected by a password are designated by a lock symbol:

Display names of process pictures
To display a descriptive name in Runtime and in the system dialog, configure a display name for a process picture in the languages used.
In WinCC Explorer, the new column "Display names" contains the configured display names in the relevant WinCC user interface language.
3.9 Extended functionality for WinCC controls

Two new controls were introduced in WinCC V7.4:

- **WinCC BarChartControl**
  Display of archive tags in a bar chart

- **WinCC SysDiagControl**
  System diagnostics of the controllers "S7-1200" and "S7-1500"

  You can find additional information under "SIMATIC S7-1200, S7-1500 Channel" channel DLL (Page 96).

Additional function extensions are available with WinCC OnlineTrendControl and WinCC AlarmControl.

**Limit monitoring in WinCC OnlineTrendControl**

As of WinCC V7.4, messages for limit violations are also displayed in WinCC OnlineTrendControl.

For process tags with configured limit monitoring, you see the assigned messages directly at the trend value:

- A red symbol signals a violation of a (high or low) limit.
- The tooltip contains the message number, message text and info text of the message.
- You jump directly from WinCC OnlineTrendControl to the assigned process picture via the function "Loop in Alarm".

**PCS 7 settings in WinCC AlarmControl**

When you use PCS 7, you can specify whether you want the PCS 7 settings to be applied in WinCC AlarmControl.

The new object property "IgnoreGlobalSettings" determines whether the central alarm system settings from the "PCS 7 Alarm Configuration Editor" are taken into consideration.
WinCC BarChartControl

The new WinCC BarChartControl shows values of archive tags in a bar chart.

You have numerous options for configuring how the bar chart is displayed:

- **Diagram window:**
  - The WinCC BarChartControl can contain one or more diagram windows.
  - Each diagram window can display multiple charts.

- **Chart types:**
  - Version 1: Only bars are displayed in the bar charts.
  - Version 2: The bar with value specification contains the value as text, optionally with display of the unit

- **Write direction:**
  - All four write directions can be configured.
  - Writing from the right is standard in the diagram window.
3.9 Extended functionality for WinCC controls

- Display of the axes:
  - Version 1: Each chart has its own axes.
  - Version 2: All charts use a common time axis and/or value axis.
  - Individual axes can be hidden if required.

- Dynamic display of the bars:
  - With acyclic archive tags, the bar width depends on the time difference of the displayed values.
  - The display is adjusted so that the bars do not overlap.
3.10 Extended functionality with options for Process Control

Improved message filter in the acoustic alarm

As of WinCC V7.4, you can specify the user text blocks as filter for triggering the signal in addition to the message class and the message priority.

By default, the first three user text blocks of a message are available with the following default setting:

- WinCC project:
  - Message text
  - Point of error
  - Block: 3
- PCS 7 project:
  - Source
  - Area
  - Event

You can optionally use the other user text blocks.

You can configure the filters for each user text block dependent on the language or language-neutral.

Cancellation filter

To negate a filter, use the following prefix:

- !

The corresponding tag is then only triggered of the filter with this prefix is not applicable.

Extended redundancy monitoring in the area overview

Status of the redundancy synchronization

The redundancy monitoring points to a redundancy synchronization that is running:

Arrow symbols signal that a redundancy server pair is currently performing a synchronization.

SIMATIC Process Historian-Server

When you use the SIMATIC Process Historian, the status of the Process Historian system is checked as well.

For the status monitoring of master (principal) and standby (mirror), WinCC uses the following system tags:

- @PHServer_Principal_State
- @PHServer_Principal_Details
- @PHServer_Mirror_State
- @PHServer_Mirror_Details
What's new in WinCC V7?

3.10 Extended functionality with options for Process Control
3.11 Extended functionality for WinCC/WebNavigator

Requirements

WinCC/WebNavigator V7.4 allows access to process pictures with the following Web viewers:

- Internet Explorer as of V10 (32-bit)
- WinCCViewerRT

Information on simplified licensing is available under "Licensing (Page 93)".

WinCCViewerRT supports load balancing

Load balancing on various WebNavigator servers is also supported by WinCC's own Web viewer "WinCCViewerRT".

Log output on the Web client

The WinCC log system is now fully supported by WinCC/WebNavigator.

You can output logs both on the WebNavigator server and on the WebNavigator client.

Web settings in the SIMATIC Manager

As of WinCC V7.4, SIMATIC Manager offers the option of specifying central Web settings for the STEP 7 multiproject.

Project-wide "Monitor only" cursor

You can specify a "Monitor only" cursor permanently for the STEP 7 multiproject in the SIMATIC Manager.

Based on the preset cursor, users on the Web client can see that they cannot operate Runtime.

The setting applies to the Web server in the STEP 7 multiproject.

Publishing process pictures for the Web access of clients

1. In SIMATIC Manager, select the PCs with the project data you want to publish:
   - Single-user systems
   - OS clients in a multiproject
   - Assigned OS servers of the OS clients
2. In the WinCC Web Publishing Wizard, you determine what will be published:
   - Process pictures
   - Graphics used in the pictures
   - C functions
3. Use the Web View Publisher to publish the project data on the Web server.
What's new in WinCC V7?

3.11 Extended functionality for WinCC/WebNavigator

See also

Licensing (Page 93)
3.12 Extended functionality for WinCC/DataMonitor

Requirements

You can use the following tools to evaluate process data with WinCC/DataMonitor V7.4:

- Internet Explorer as of V10 (32-bit)
- WinCCViewerRT
- Microsoft Excel 2007 SP2
- Microsoft Excel 2010 (32-bit)
- Microsoft Excel 2013 (32-bit)

Information on simplified licensing is available under "Licensing (Page 93)."

Terminal services: Extended configuration limits

WinCC/DataMonitor allows the simultaneous operation of up to 50 clients per server.

Using terminal services

A configuration with 50 DataMonitor clients per terminal services server has been tested as a typical scenario.

See also

Licensing (Page 93)
3.13 Extended functionality for WinCC/WebUX

WinCC/WebUX V7.4: Extended range of functions

WinCC/WebUX provides a solution for operator control and monitoring of the automation system independent of device and browser.

With the current version, WebUX supports most functions of WinCC Runtime. These include, e.g.:

● Touch operation in process pictures and WinCC controls
● User administration via SIMATIC Logon
● System events for user logon and logoff
● Assignment of dynamic attributes to graphic objects
  – Trigger
  – Tag connection
  – Direct connection
  – Dynamics dialog
  – VBS actions

Support for the configuration for WebUX:

● When process pictures are saved, they are checked for Web-compatibility and the results are written to a log.
● Dynamic dialogs are automatically converted in VB scripts.

Information on simplified licensing is available under "Licensing (Page 93)".

Supported graphic objects:

The support for Graphics Designer objects has been enhanced:

● Application window (for the script diagnostics)
● Bar
● The "Operator message" object property is supported for all objects.
● The "Operator Activities Report" object property is supported for an I/O field.

Supported WinCC controls

The following WinCC controls are supported:

● WinCC Alarm Web Control
● WinCC OnlineTable Web Control
● WinCC OnlineTrend Web Control
● WinCC FunctionTrend Web Control
● WinCC Ruler Web Control
3.13 Extended functionality for WinCC/WebUX

- WinCC Slider Control
- WinCC Digital/Analog Clock Control
- WinCC Gauge Control
- WebBrowser Control

See also

Licensing (Page 93)
3.14 Other Innovations

In addition to the described new features, WinCC V7.4 offers other new functions and extensions:

- WinCC channel "OPC UA WinCC Channel"
- WinCC installation:
  - Installation "WinCC client"
  - Automatic installation with the "Record function"
- WinCC autostart configuration via Remote access
- Remote maintenance via Remote Desktop Protocol (RDP)
- Remote configuration: Addressing outside the subnet via host names
- Archiving:
  - Example: Connect or terminate database backup with VBS
  - Compressed archive: Differences for ascending/descending values
- New ODK function in alarm logging

WinCC channel "OPC UA WinCC Channel"

As a new OPC UA client (DataAccess), WinCC V7.4 contains the "OPC UA WinCC Channel" communication channel.

The "OPC UA WinCC Channel" offers full access to actual values (DataAccess) via OPC UA on the OPC UA server in accordance with the OPC Unified Architecture specification.

New editor: WinCC OPC UA Configurator

The new WinCC OPC UA Configurator provides support for the configuration of the "OPC UA WinCC Channel" channel.

The editor takes on the following functions:

- Selecting the OPC UA server
- Creating a connection
- Creating a tag group
- Tag selection
- Adding tags in WinCC

The WinCC Configuration Studio is not used for configuration of WinCC OPC UA tags. In this case, you can use the WinCC tag management only to display tags.
WinCC installation

Installation "WinCC client"
With the "RT Client" or "RC Client" client licenses you can operate both clients without their own project and clients with their own project.

The program package "WinCC Client" is available to you during the WinCC installation.

The following components are installed:
- WinCC Runtime
- WinCC CS
- Basic Process Control
- SQL Express

Automatic installation with the "Record function"
The function "Central Installation" with record function allows you to perform the same installation on multiple PCs.

During the execution of the setup, the record function records the settings and creates a configuration file that supports you in the following installation operations. You can store the setup centrally and start it from a network drive for this purpose.

WinCC autostart configuration via Remote access
With WinCC V7.4, you can configure the autostart function identically for multiple PCs.

The revised function "AutoStart Configuration" provides the following options:
- Autostart configuration independent of open project
- Set up autostart for the local PC
- Set up autostart for another PC in the WinCC system
- Set up WinCC logon during autostart on a client without its own project
- Set up automatic WinCC logon for all Windows users
- Temporarily deactivate autostart for a PC and activate it again

Remote maintenance via Remote Desktop Protocol (RDP)
In WinCC ServiceMode, you can access the WinCC PCs via the Remote Desktop Protocol (RDP).

The following scenarios are released for use of RDP in WinCC ServiceMode:
- 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 in integrated operation in SIMATIC Manager is not released.

Remote configuration: Addressing via computer names
When you access computers outside a subnet, use the “Simatic Shell” dialog to configure access to a PC that serves as proxy for distributing your multicast packages.
As “Multicast Proxy”, you can also directly enter the computer name, as alternative to the IP address.

Archiving

Connect or terminate database backup with VBS
For connecting or disconnecting a database backup, a new example is available in the WinCC Information System under "VBS for creating procedures and actions > Examples of VBScript > Examples of WinCC".
This example describes access to a swapped-out WinCC process value archive via the WinCC OLE DB Provider. A backup file is connected, read and the connection is terminated again.

Compressed archive: Differences for ascending/descending values
As of WinCC V7.4, the differences for ascending and descending values of compression tags are stored.
The difference is calculated for the ascending and/or descending process values of two archiving cycles. The overflow of values is taken into consideration when the high or low counter limit is reached.

New ODK function in alarm logging
As of WinCC V7.4, the advanced function "MSRTGetMsgCSDataExMC" enables access to the configuration data of messages.
The function always returns the following data:
• Tag names with a server prefix in the "MSG_CSDATA_EX_STRUCT" structure via the "MSG_CSDATA_CALLBACK_PROC" callback function
• List of message numbers, each with a callback to the given message
"MSRTGetMsgCSDataExMC" replaces the "MSRTGetMsgCSData" and "MSRTGetMsgCSDataMC" functions.
The new function also supports distributed systems, in which clients with a separate project are used.
4.1 Warnings

Safety 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

Proper 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.

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Security information

Siemens provides products and solutions with industrial security 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 security concept. Siemens’ products and solutions only form one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the Internet if necessary and only to the extent necessary and with appropriate protective measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens’ guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit


Siemens’ products and solutions undergo continuous development to make them more secure. Siemens strongly recommends applying product updates as soon as they are available and always using the latest product versions. Using versions that are obsolete or are no longer supported can increase the risk of cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

Disclaimer of liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. However, 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. 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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Siemens AG
Division Digital Factory
SIMATIC Human Machine Interfaces
P.O. Box 4848
D-90026 Nuremberg, Germany

See also

4.2 Customer support

Customer Support and Technical Support

You can reach the SIMATIC hotlines at the times specified in the following table. 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

Nuremberg (GMT +1:00)
Service Hours Monday - Friday, 8:00 to 17:00 (CET/CEST)
Phone +49 (0)911 895 7222
Fax +49 (0)911 895 7223
E-mail https://support.industry.siemens.com/My/ww/en/requests

An overview of the Technical Support is available at the following URL:


Automation Value Card (AVC)

The Automation Value Card (AVC) provides extended Technical Support and is available 24 hours every day of the week. Information on the AVC can be found at the following URL:


SIMATIC Customer Online Support

Service and Support

An overview of the support offering for our products is available at the following URL:

- https://support.industry.siemens.com/

In Product Support, for example, you will find downloads of firmware updates, service packs and useful utilities.

Online Help is available so that you can successfully use the Support offering. Open the Online Help by selecting the corresponding button on the Internet site or at the following URL:


The app is available for mobile Siemens Support:

- https://support.industry.siemens.com/cs/sc/2067
WinCC FAQs
WinCC Online Support with information on FAQs (Frequently Asked Questions) may also be found at the following URL:

Technical Forum
The Technical Forum supports exchange with other SIMATIC users. It is available at the following URL:
- https://support.industry.siemens.com/tf/

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:

Contact person database
To contact your local agent, search our contact database at the following URL:
- http://w3.siemens.com/aspa_app/

Product Information

SIMATIC WinCC
Go to the following URL for additional information about WinCC products:
- http://www.siemens.com/wincc

SIMATIC Products
Go to the following URL for additional information about SIMATIC products:
- http://www.siemens.com/simatic

See also
Internet: Support Request (https://support.industry.siemens.com/My/ww/en/requests)
Internet: Service and Support (https://support.industry.siemens.com/cs/ww/en/)
Internet: 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: Support Search  (http://www.siemens.de/automation/csi_en/km)
Internet: Information about WinCC  (http://www.siemens.com/wincc)
Internet: SIMATIC Products  (http://www.siemens.com/simatic)
4.3 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 topic "Performance Data").

Support Request form

The Support Request form is available at the following URL:

- [http://www.siemens.com/automation/support-request](http://www.siemens.com/automation/support-request)

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

A detailed description of the Support Request can be found at the following URL:


Procedure

1. Open the "Support Request" form using the link on the Internet. Step 1 "Select product" is displayed:

2. Enter the project name in the "Product/Order number" box. Upper/lower case is not relevant. Search for parts of the product name or enter the full product name in the correct order. You can e. g. search for the following terms:
   - "WinCC Runtime"
   - "WinCC DataMonitor"
   - "wincc webnavigator"
   - "Connectivity"
   The found products are offered in the "Product selection" field.

3. Select the desired product and click on "Next" to switch to step 2 "Select use case".

4. Select a use case or describe your specific use case in the "Other use case" field.

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

7. Use the "Search" button to upload your affected project and the log files (e.g. as a Zip file) to the Support Request. Press "Next" to switch to step 5 "Provide contact information".

8. Enter your contact information. Read the privacy notice and choose whether your personal data should be permanently saved. Press "Next" to switch to step 6 "Summary & Send".

9. Press the "Print" button if you would like to print the support request. You close the support request by clicking the "Send" button. Your data will be transmitted to Customer Support and processed there.

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

Your WinCC Team

See also

4.4 Help on WinCC Documentation

4.4.1 WinCC Documentation

WinCC Online Information

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

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

WinCC offers the following support for configuration tasks:

- Tooltips
- Notes in the status bar
- Direct Help
- WinCC Information System with detailed documentation
- PDF files
- 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 123)
- Direct Help ("What's This?") in WinCC (Page 124)
- WinCC Information System (Page 126)
- Navigation in the WinCC Information System (Page 128)
- Search in WinCC Information System (Page 130)

4.4.2 Tooltips and Status Bar

Information on Menu Commands and Buttons

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

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

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

### See also

- [WinCC Documentation](Page 123)
- [Direct Help ("What's This?") in WinCC](Page 124)
- [WinCC Information System](Page 126)
- [Navigation in the WinCC Information System](Page 128)
- [Search in WinCC Information System](Page 130)

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

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

The "What's This?" help contains information on the buttons, icons, fields, windows and dialogs in WinCC. 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 the window and drag it with the mouse, or scroll down or to the right with 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](Page 124)
- ![in the title bar of an open dialog, in order to obtain help on the dialog](Page 124)
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.

**Documentation outside the WinCC Information System**

Help appears directly on the following topics:

- "PROFIBUS DP" Channel (communication)
- "SIMATIC 505 TCPIP" Channel (communication)

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

**Accessing the WinCC Information System**

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

**Note**

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

**See also**

- Tooltips and Status Bar (Page 123)
- WinCC Documentation (Page 123)
- WinCC Information System (Page 126)
- Navigation in the WinCC Information System (Page 128)
- Search in WinCC Information System (Page 130)
4.4.4 WinCC Information System

Contents of the WinCC Information System

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

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

Calling up the WinCC Information System

Menu command "?" > "Help Topics"

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

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

From "What's This?" help

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

From the Start Menu

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

Structure of the WinCC Information System

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

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

Color coding in the section headings in online help

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

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

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

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

The following notation is used in the online help:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expandable text</strong></td>
<td>Heading with this form indicate expandable text in the online help.</td>
</tr>
</tbody>
</table>

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.

You can find the main chapters of the WinCC Information System as PDF files via the Windows Start menu "Start > Simatic > WinCC > WinCC Information System". To open these files, you will need Adobe Acrobat Reader.

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


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

WinCC Portal

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

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

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

Navigation Area Tabs

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

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

Navigation using Header Buttons

The buttons in the header provide the following access options:

<table>
<thead>
<tr>
<th>Tab</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Hide&quot;</td>
<td>Click this button to hide the navigation section with the &quot;Contents&quot;, &quot;Index&quot; and &quot;Search&quot; tabs. The information system then requires less space on the screen.</td>
</tr>
<tr>
<td>&quot;Show&quot;</td>
<td>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.</td>
</tr>
<tr>
<td>&quot;Back&quot;</td>
<td>Click this button to return to the previous page.</td>
</tr>
<tr>
<td>&quot;Forward&quot;</td>
<td>Click this button to go to the next page.</td>
</tr>
</tbody>
</table>
Navigation on the "Contents" Tab

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

<table>
<thead>
<tr>
<th>Tab</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>⊕</td>
<td>Click this button to display the subordinate hierarchy levels of a book.</td>
</tr>
<tr>
<td>📚</td>
<td>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.</td>
</tr>
<tr>
<td>📚</td>
<td>Double click one of these buttons to open a help topic.</td>
</tr>
<tr>
<td>📚</td>
<td>Double click one of these buttons to open an instruction for action.</td>
</tr>
<tr>
<td>📚</td>
<td>Double click one of these buttons to open an example.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Tab</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Section</td>
<td>Go to a specific topic within the page.</td>
</tr>
<tr>
<td>Instructions</td>
<td>Provides links to step-by-step instructions.</td>
</tr>
<tr>
<td>Examples</td>
<td>Provides links to application examples and sample cases.</td>
</tr>
<tr>
<td>Basics</td>
<td>Provides links to additional information, e.g. definitions or details.</td>
</tr>
<tr>
<td>Properties</td>
<td>Provides links to information on the properties of objects.</td>
</tr>
<tr>
<td>Methods</td>
<td>Provides links to information on methods that are applied to objects.</td>
</tr>
<tr>
<td>Events</td>
<td>Provides links to information on events that are applied to objects.</td>
</tr>
<tr>
<td>Objects</td>
<td>Provides links to information on related objects.</td>
</tr>
<tr>
<td>Tools &gt; Open</td>
<td>Opens all closed dropdown texts and dropdown images.</td>
</tr>
<tr>
<td>Tools &gt; Close</td>
<td>Closes all open dropdown texts and dropdown images.</td>
</tr>
<tr>
<td>Tools &gt; Verlauf</td>
<td>Offers links to topics opened earlier. Maximum ten topics are saved in Verlauf.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;ALT+RIGHT&gt;</td>
<td>Go to next page.</td>
</tr>
<tr>
<td>&lt;ALT+LEFT&gt;</td>
<td>Go to previous page.</td>
</tr>
<tr>
<td>&lt;LEFT&gt;</td>
<td>Move the scroll bar in the active window to the left.</td>
</tr>
<tr>
<td>&lt;RIGHT&gt;</td>
<td>Move scroll bar in the active window to the right.</td>
</tr>
<tr>
<td>&lt;UP&gt;</td>
<td>Move scroll bar in the active window upwards.</td>
</tr>
<tr>
<td>&lt;DOWN&gt;</td>
<td>Move scroll bar in the active window downwards.</td>
</tr>
<tr>
<td>&lt;CTRL+TAB&gt;</td>
<td>Switch between the tabs (&quot;Contents&quot;, &quot;Index&quot;, &quot;Search&quot; and &quot;Favorites&quot;).</td>
</tr>
<tr>
<td>&lt;ENTER&gt;</td>
<td>Display a topic selected on a tab in the navigation panel.</td>
</tr>
<tr>
<td></td>
<td>Trigger the function of the button previously selected.</td>
</tr>
<tr>
<td>&lt;F6&gt;</td>
<td>Toggle between navigation and topic panel.</td>
</tr>
<tr>
<td>&lt;TAB&gt;</td>
<td>Switch between the buttons in the topic area.</td>
</tr>
</tbody>
</table>

See also

- WinCC Documentation (Page 123)
- Tooltips and Status Bar (Page 123)
- Direct Help ("What’s This?") in WinCC (Page 124)
- WinCC Information System (Page 126)
- Search in WinCC Information System (Page 130)

4.4.6 Search in WinCC Information System

Full Text Search on the "Search" Tab

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

Expanded Search

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

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

Use quotation marks to search for phrases.
- Example: "Configuring graphics"

Boolean Operators

The arrow beside the input field can be used to logically link the search term with AND, OR, NEAR and NOT.
- Example: "Configuring" AND "graphics"

Match Similar Words

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

Search Titles Only

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

Search Previous Results

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

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

Sorting Search Results

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

Storing Search Terms

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

Displaying Search Results

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

If the search term is only part of a word, it is possible that the term is not marked. Use the key combination <CTRL+F> to activate the search within the page.
4.4.7 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

2. Select "Manuals/Operating Instructions" as the entry type in the filter settings.
3. Go to the "WinCC Information System Online Help" documentation and click on one of the desired manuals, such as "WinCC: Working with WinCC".
4. 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.

Direct call of "My Documentation Manager"

If you have already displayed or compiled documents in "My Documentation Manager", use support.automation.siemens.com (http://support.automation.siemens.com/WW/view/en/10805583/133000) to open "My Documentation Manager". Click on the link "My Documentation Manager" in the link box "mySupport" on the right. On the start page you will find a detailed description of the functions and operation of "My Documentation Manager".

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 alarm system
3. Select the type of Help page as the topic type, for example, "Action".
4. Click "Search". The search results are displayed below.
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 WinCC documents are available in all languages supported by WinCC. These are mainly German, English, French, Italian, Spanish, Japanese, Chinese, Korean and Taiwanese.

To set the language for a document in "My Documentation Manager", right-click on the title of the document. Select the required language.
5.1 Introduction

Introduction

This section contains information on the migration of WinCC projects created in WinCC V6.2 SP3 or higher.

When you open a project of a previous version in WinCC V7.4, you are prompted to migrate it. However, you may also use WinCC Project Migrator to migrate several WinCC projects in a single step.

Prior to migration, it is recommended to make a backup copy of the original version of the project. For more information on this, refer to the "Working with WinCC" > "Working with projects" > "Copying and duplicating projects" section in the WinCC Information System.

Multi-user Projects

When you are working with a multi-user project in WinCC V7.4 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 are provided in the section "Upgrading Redundant Systems in Normal Operation".

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrating redundant systems without extended interruption</td>
</tr>
</tbody>
</table>

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 if it is 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

In WinCC V7.2 and higher, the data of the WinCC/CAS is migrated to SIMATIC Process Historian. Observe the migration description 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 smart 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 clients 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. For this purpose, for example, you need to adapt screens and script files to the current version of WinCC and convert these to the current format.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conversion is irrevocable</strong></td>
</tr>
<tr>
<td>Conversion of data cannot be undone.</td>
</tr>
<tr>
<td>Conversion starts immediately once you have selected the entry. No confirmation prompt is displayed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is not possible to convert an individual picture or a library object.</td>
</tr>
<tr>
<td>Conversion of pictures and libraries may take some time.</td>
</tr>
</tbody>
</table>
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
3. 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.
For additional information, refer to "How to migrate SQL Server 2000 databases (Page 142)".

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 to WinCC V7.4.

See also
Important differences compared to previous versions (Page 138)
Conditions for Migration (Page 141)
How to migrate SQL Server 2000 databases (Page 142)
5.2 Important differences compared to previous versions

Introduction

Version 7.4 of WinCC provides new and enhanced functions as compared to the predecessor version. An overview of the new features is provided in the section "What's New in WinCC V7.4?".

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 controls.

Changeover to SQL Server 2014 in WinCC V7.4

Starting in WinCC V7.4 SP1, Microsoft SQL Server 2014 SP2 32-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 142)".

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.

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 WinCC Configuration Studio replaces the previous procedure for the following editors:

- Tag Management
- Tag Logging
- Alarm Logging
- Text library
- User Administrator
- Horn
- User archive
WinCC Configuration Studio replaces the functionality of WinCC Configuration Tool and WinCC Archive Configuration Tool.

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. You may archive these process tags and view them in Runtime in TagLogging controls.
- Setup contains a project library for all languages.

<table>
<thead>
<tr>
<th>NOTICE</th>
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</thead>
<tbody>
<tr>
<td>The source language of a project cannot be set more than once in the migrator</td>
</tr>
</tbody>
</table>

You cannot rectify an incorrect setting of the source language, because a project can be migrated only once to the version.

Backup the projects and project libraries before you launch migration.

The following must be installed for migration of Asian projects on a European operating system:
- Asian language support
- The respective language code page.

The source language of the project must be known and set up for migration.

Exceptions
- Scripting components.
  VB Scripts may contain text in a specific language.
  The C compiler does not support Unicode. Even though you can save C scripts in Unicode, for example, the compiler 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.
See also

How to migrate SQL Server 2000 databases (Page 142)
5.3 Conditions for Migration

Introduction

You can migrate a WinCC project on any computer on which WinCC V7.4 has been installed. The WinCC Project Migrator is included in the standard installation scope of WinCC V7.4.

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:

<table>
<thead>
<tr>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
</tr>
<tr>
<td>The requirements are specified in the &quot;Hardware requirements&quot; and &quot;Software requirements&quot; section of the installation instructions.</td>
</tr>
<tr>
<td>CPU</td>
</tr>
<tr>
<td>RAM</td>
</tr>
<tr>
<td>Free memory space on the hard disk</td>
</tr>
<tr>
<td>In addition, at least the size of the overall project. Migration increases the size of the projects.</td>
</tr>
<tr>
<td>User Rights</td>
</tr>
<tr>
<td>User must be a member of the &quot;SIMATIC HMI&quot; group</td>
</tr>
<tr>
<td>WinCC version installed</td>
</tr>
<tr>
<td>WinCC V7.4</td>
</tr>
<tr>
<td>WinCC version project data</td>
</tr>
<tr>
<td>WinCC V7.3, V7.2, V7.0 or V6.2 SP3</td>
</tr>
<tr>
<td>Licenses</td>
</tr>
<tr>
<td>New V7.4 RC license or RT license for PowerTags</td>
</tr>
<tr>
<td>System status</td>
</tr>
<tr>
<td>WinCC closed:</td>
</tr>
<tr>
<td>● Runtime deactivated</td>
</tr>
<tr>
<td>● WinCC Editors closed</td>
</tr>
<tr>
<td>● WinCC Explorer closed</td>
</tr>
</tbody>
</table>

See also

How to migrate SQL Server 2000 databases (Page 142)
5.4 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 SQL Server 2014 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 141)
5.5 How to migrate the WinCC data

Introduction

This chapter describes the migration of WinCC projects of WinCC V6.2 SP3 or higher to WinCC V7.4.

You have two options of migrating the projects:

- Migration of the configuration data and runtime data when opening an old project
- Using WinCC Migrator to migrate several projects in a single step.

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

WinCC projects before V7.2 are migrated to UNICODE. Tables that do not originate from WinCC are excluded from 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

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.

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.

Using WinCC Project Migrator to migrate the WinCC projects

1. Open "Simatic > WinCC > Tools > Project Migrator" in the Start menu of the operating system. 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".
5.6 How to migrate S7 projects

Introduction
You have three options for migrating S7 projects of WinCC V6.2 SP3 or higher to WinCC V7.4:

- 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
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. Proceed as follows. You may also open the project partitions successively to 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
You must migrate 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.
5.7 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.
5.8 Additional Steps

Introduction

You still have to make some project settings after migration.

Updating System Messages in Alarm Logging

Once you have integrated the system messages in the message system and completed migration, you must update the system messages in Alarm Logging. New system messages are also applied with this step.

1. In the table area of Alarm Logging, select the system messages to be updated.
   If you want to update all system messages, select the "Select All" command in the shortcut menu.
2. Select the "Update" command in the shortcut menu.
   Selected system messages are updated, and new system messages are integrated into the project. The system messages obtain texts from the selected language for the selected user text block.

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 > Multi-user systems > Server configuration" or "Client configuration" in the WinCC Information System.

WinCC/WebUX: Converting project data

A project created with a WinCC version earlier than WinCC V7.4 must be adjusted for use in WinCC/WebUX:

- 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 ab 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.

See also
Migration Diagnostics (Page 162)
5.9 Upgrading a Redundant System in Normal Operation

5.9.1 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

5.9.2 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
5.9 Upgrading a Redundant System in Normal Operation

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.

5.9.3 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.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure</td>
</tr>
<tr>
<td>In order not to interrupt operation of the system, observe the sequence of steps described.</td>
</tr>
<tr>
<td>Complete the steps in phases 1 to 4 without any longer interruption.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a backup copy before upgrading the server.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please note that you must work alternately on Server1 and Server2.</td>
</tr>
</tbody>
</table>

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.

5.9.4 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.

5.9.5 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.
5.9.6 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.
5.10 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.

Cancellation 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.
6.1 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.
6.2 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.
6.3 ApDiag Menu Commands

6.3.1 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.

- Output On Screen
- Output To File...
- Reset Buffer

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.

- FirstAction...
- Count of Connections
- Count of Actions in RequestQueue
- Count of TransAction
- Count of Actions of each Transaction
- Count of Tags in each Transaction
- Count of Actions in Cycle
- Count of Functions

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

**6.3.2 File - Exit**

**Description**

Use command "Exit" to end ApDiag.
6.3.3 Diagnostics

6.3.3.1 Start

Description

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

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

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

In chapter "Trace points and their diagnostics level), a selection of trace points is described. The diagnosis is different from the "printf information" in that the entries are collected with the window closed as well and mainly system messages (trace points) are shown.

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

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

Note

End ApDiag

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

The option "Start automatically at WinCC start" offers the ability to start the diagnosis in the defined level automatically, each time a project is opened.
Since writing the trace points influences the performance, trace should really be switched off for normal operation.

---

**Note**

End ApDiag

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

---

### 6.3.3.2 Change

**Description**

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

![Dialog](image)

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.
6.3.3.3 Stop

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

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

6.3.3.4 OnFile

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

Since converting the diagnostics information influences the performance and the settings made here are retained after restarting WinCC or the computer, you can use option "NothingInFile" to centrally stop writing the diagnostics information to a file.
Nothing In File

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

Anything In File

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

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

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

- ..\Siemens\WinCC\Diagnose

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

OnPrintf

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

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

- ..\Siemens\WinCC\Diagnose

Particular attention is paid to the file size. 64 KB is written to a file and then the next file is begun. It is always started with Onprintf0. After file Onprintf10, it begins with 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 OnDiagnose10, it begins with OnDiagnose0 again. After activation, it is also started with OnDiagnose0 the first time the function is called.

OnProfile

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

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

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

OnInfo

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

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

- ..\Siemens\WinCC\Diagnose

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

6.3.3.5 Profile

Description

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

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

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

General Information on Queue Overflow

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

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

Since performance measurements themselves will cause extra load and any settings made in this context are retained after restarting WinCC or the computer, a superordinate switch has been integrated, which allows a quick overview to prevent any diagnostics measurements from remaining switched on.

Profile off

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

Profile on

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

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

Example

=OnTime=

dwCode: (ThreadId 327) 113
szTimeText: (ThreadId 327) PROFILE_EACH_ACTION
dblTime: (ThreadId 327) 358.744
szApplicationName: (ThreadId 327) PDRuntimeSystem
bCycle: (ThreadId 327) acycle
szFunctionName: (ThreadId 327) @61
lpszPictureName: (ThreadId 327) STARTBILD_BILDFENSTER1_AKTIONSTESTBILD3
lpszObjectName: (ThreadId 327) Button17
lpszPropertyName: (ThreadId 327) (NULL)
dwParamSize: (ThreadId 327) 12

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) 4325.03
szApplicationName: (ThreadId 492) PDRuntimeSystem
bCycle: (ThreadId 492) cycle
szFunctionName: (ThreadId 492) @55
lpszPictureName: (ThreadId 492) STARTBILD_BILDFENSTER1_AKTIONSTESTBILD
lpszObjectName: (ThreadId 492) EA Feld1
lpszPropertyName: (ThreadId 492) Visible
dwParamSize: (ThreadId 492) 12

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

6.3.3.6 FillTags

Description

Using menu command "FillTags", saving important diagnostics values in tags can be switched on.

![Dialog](image)

The diagnostics tags are created during the creation of a WinCC project and can be used as usual. Switching on and off is also possible with internal function FillDiagnoseInTags(). This function is described in the WinCC Help.

Note that writing the diagnostics values created more basic load. The runtime for each started action is lengthened since the diagnostics values also have to be written in the tags. This functionality should therefore be switched on for a short time only.

WinCC Diagnostics tags

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>@SCRIPT_COUNT_TAGS</td>
<td>This tag contains the current number of tags requested via Script.</td>
</tr>
<tr>
<td>@SCRIPT_COUNT_REQUEST_IN_QUEUES</td>
<td>This tag contains the current number of jobs.</td>
</tr>
<tr>
<td>@SCRIPT_COUNT_ACTIONS_IN_QUEUES</td>
<td>This tag contains the current number of actions that exist for processing.</td>
</tr>
</tbody>
</table>
6.3.4 Output

6.3.4.1 Output On Screen

Description

Use menu command "Output On Screen" to open the diagnostics window. The previously collected trace entries are output here. Unlike Output Window, the diagnostics window is only updated when opening and with the "Refresh" button. The contents are only deleted if Reset is actuated or the diagnostics buffer has been written full.

![Diagnosis Window](image)

Note

Sequence in the Diagnostics Buffer

The diagnostics buffer is a circulating buffer. The lowest entry is therefore not necessarily the oldest entry.
6.3.4.2 Output To File

**Description**

Menu command "Output To File" can be used one time to put the previously collected trace entries into a text file.

![Save As dialog box](image)

6.3.4.3 Reset Buffer

**Description**

Use menu command "Reset Buffer" to delete the previously collected trace entries.

This functionality corresponds with the "Reset" button in the diagnostics window.

6.3.5 Info

6.3.5.1 FirstAction

**Description**

Menu command "FirstAction" delivers information on the action that is running and therefore provides the ability to recognize which action in the queue is in the first position and e.g. blocks the processing of other actions with a loop.

Similar to OnErrorExecute, the actions that are currently being processed are put in a text file. In addition, the stack for these actions is output so that it is possible to recognize whether the action e.g. is frozen in DLL calls.
The information on the currently processed action is also output again as OnErrorExecute.

Note
If no action is blocking the processing, no text file will be created and no OnErrorExecute will be output.

Example

A "blocking" action can be simulated 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\uTools\Apdiag.exe.
2. Select "Info > FirstAction".
3. Enter the name of a text file in dialog "Save as".

The following information is then put in the text file:
And the following OnErrorExecute is output:
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);
6.3.5.2 Count of Connections

Description

The menu command "Count of Connections" lists all applications that have established a connection to the action control.

Example

=================================================================
1. Applikation: GSC_R
2. Applikation: ITLG-RT
3. Applikation: PDLRuntimeSystem
4. Applikation: APDiagnose
=================================================================

6.3.5.3 Count of Actions in RequestQueue

Description

Menu command "Count of Actions in RequestQueue" outputs the current number of actions that are queued for processing.

There are jobs from Global Script, cycle jobs from pictures and event-controlled jobs from pictures.

Example

=================================================================
Applikation: GSC_R cycle Count of Requests 0
Applikation: PDLRuntimeSystem cycle Count of Requests 0
Applikation: PDLRuntimeSystem acycle Count of Requests 1
=================================================================

6.3.5.4 Count of TransAction

Description

Menu command "Count of TransAction" lists the current number of transactions for every application that is logged in.
One transaction is established e.g. for every event-controlled action, for every picture window, which contains at least one cyclic action, and for global scripts.

Example

================================================================================
1. Applikation: GSC_RT Count of Transactions 1
2. Applikation: ITLG-RT Count of Transactions 0
3. Applikation: PDLRuntimeSystem Count of Transactions 7
4. Applikation: APDiagnose Count of Transactions 0
================================================================================

6.3.5.5 Count of Actions of each Transaction

Description

Menu command "Count of Actions of each Transaction" lists the number of actions contained in the transactions.

The output is in the following form:

- Name of the Application
- Number of the Transaction
- Number of Actions

At the end of the list, the total sum of actions is output.

Example

================================================================================
Info to Transactions: 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(0): 19
Info to Transactions: Count of Action in Transaction 40
================================================================================
6.3.5.6 Count of Tags in each Transaction

Description

Menu command "Count of Tags in each Transaction" lists the number of tags requested in the transactions.

The output is in the following form:
- Name of the Application
- Number of the Transaction
- Cycle time, with which the tags use for logging in
- Number of tags

At the end of the list, the total sum of tags requested in transactions is output.

The numerical value defined in Cycle corresponds with the following trigger:

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Upon change</td>
</tr>
<tr>
<td>1</td>
<td>250 ms</td>
</tr>
<tr>
<td>2</td>
<td>500 ms</td>
</tr>
<tr>
<td>3</td>
<td>1 s</td>
</tr>
<tr>
<td>4</td>
<td>2 s</td>
</tr>
<tr>
<td>5</td>
<td>5 s</td>
</tr>
<tr>
<td>6</td>
<td>10 s</td>
</tr>
<tr>
<td>7</td>
<td>1 min</td>
</tr>
<tr>
<td>8</td>
<td>5 min</td>
</tr>
<tr>
<td>9</td>
<td>10 min</td>
</tr>
<tr>
<td>10</td>
<td>1 h</td>
</tr>
<tr>
<td>11 - 15</td>
<td>User cycle 1 - 5</td>
</tr>
</tbody>
</table>

Example

===============================================================================
Info to Transaktions: Count of Tags in Transaction
1.Aplikation: GSC_RT Count of Tags in TransAction(0) in Cycle 0: 1
1.Aplikation: GSC_RT Count of Tags in TransAction(0) in Cycle 4: 6
3.Aplikation: PDLRuntimeSystem Count of Tags in TransAction(0) in Cycle 2: 1
Info to Transaktions: Count of Tags in Transaction 8
===============================================================================

WinCC: General information and installation
System Manual, 02/2017, A5E40840020-AA
6.3.5.7 Count of Actions in Cycle

Description

Menu command "Count of Actions in Cycle" lists the amount of cyclic actions sorted by trigger. In this case, the numerical values correspond with the following triggers:

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>250 ms</td>
</tr>
<tr>
<td>1</td>
<td>500 ms</td>
</tr>
<tr>
<td>2</td>
<td>1 s</td>
</tr>
<tr>
<td>3</td>
<td>2 s</td>
</tr>
<tr>
<td>4</td>
<td>5 s</td>
</tr>
<tr>
<td>5</td>
<td>10 s</td>
</tr>
<tr>
<td>6</td>
<td>1 min</td>
</tr>
<tr>
<td>7</td>
<td>5 min</td>
</tr>
<tr>
<td>8</td>
<td>10 min</td>
</tr>
<tr>
<td>9</td>
<td>1 h</td>
</tr>
<tr>
<td>10 - 14</td>
<td>User cycle 1 - 5</td>
</tr>
</tbody>
</table>

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
==================================================================================================
6.3.5.8 Count of Functions

Description
Menu command "Count of Functions" provides the number of standard functions and project functions and lists the functions by name.

Example

=================================================================================================================================
Count of Functions 112
FunctionName UTC PathName  \SERVER1\WinCC50_Project_GSLasttest\library\UTC.Fct
FunctionName WriteNow PathName  \SERVER1\WinCC50_Project_GSLasttest\library\WriteNow.Fct
=================================================================================================================================

6.3.6 Trace Points - Change Level

Description
The levels of certain trace points can be changed with this menu command.

Change Level...

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.
6.3.7 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 a 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.
6.4 Appendix

6.4.1 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

<table>
<thead>
<tr>
<th>Trace point</th>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NewRequest nCount</td>
<td>9</td>
<td>With more than 5 jobs, the position is output in the queue for every new job (Request).</td>
</tr>
<tr>
<td>more as 10000 Actions to work</td>
<td>9</td>
<td>Overflow, more than 10000 actions in the queue.</td>
</tr>
<tr>
<td>before Execute dwID</td>
<td>d</td>
<td>Before executing an action, the action ID is output in hex.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If it is a Global Script action, the connection to the action name can be made via</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the GSC runtime application window. The same ID is output in OnErrorExecute.</td>
</tr>
<tr>
<td>Exception in cissexecute dwID</td>
<td>d</td>
<td>If there is an error with an action, the action ID is output in hex.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If it is a Global Script action, the connection to the action name can be made via</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the GSC runtime application window.</td>
</tr>
<tr>
<td>after Execute dwID</td>
<td>d</td>
<td>After executing an action, the action ID is output in hex.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If it is a Global Script action, the connection to the action name can be made via</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the GSC runtime application window.</td>
</tr>
<tr>
<td>Exception in new Variant dwID</td>
<td>d</td>
<td>Error with return value of an attribute side action.</td>
</tr>
<tr>
<td>Ende Execute dwID</td>
<td>d</td>
<td>Action ID processing complete.</td>
</tr>
<tr>
<td>Anfang deaktivieren</td>
<td>3</td>
<td>Deactivation initiated.</td>
</tr>
<tr>
<td>Ende deaktivieren</td>
<td>3</td>
<td>Deactivation complete.</td>
</tr>
<tr>
<td>APDMConnect-Thread said goodbye</td>
<td>1</td>
<td>The thread that prepares the connection between the script control, tag management and other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>applications was ended unexpectedly.</td>
</tr>
<tr>
<td>Begin Start Transaction dwTransID:</td>
<td>d</td>
<td>A new transaction is logged in and the transaction ID output.</td>
</tr>
<tr>
<td>Trace point</td>
<td>Level</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>no PCode</td>
<td>3</td>
<td>A Global Script action or a function contains no executable code (P-Code).</td>
</tr>
<tr>
<td>Error in FunctionName</td>
<td>3</td>
<td>Incorrect function name.</td>
</tr>
<tr>
<td>Function %s unknown.</td>
<td>3</td>
<td>Unknown function</td>
</tr>
<tr>
<td>wrong ReturnTyp</td>
<td>3</td>
<td>Return value type is invalid.</td>
</tr>
<tr>
<td>Ende Start Transaction dwTransID:</td>
<td>d</td>
<td>Transaction logged in.</td>
</tr>
<tr>
<td>Begin Start TransactionGTI dwTransID:</td>
<td>d</td>
<td>A transaction with cyclic actions or Global Script actions is logged in.</td>
</tr>
<tr>
<td>Begin EndAct</td>
<td>d</td>
<td>Transaction logging out initiated.</td>
</tr>
<tr>
<td>Begin EndAct dwTransID:</td>
<td>d</td>
<td>Transaction number</td>
</tr>
<tr>
<td>Ende EndAct ok</td>
<td>d</td>
<td>Transaction logging out completed.</td>
</tr>
<tr>
<td>Begin Compile</td>
<td>6</td>
<td>Compiler process initiated.</td>
</tr>
<tr>
<td>projectpath:</td>
<td>6</td>
<td>Compiler: Aplib and Library directory</td>
</tr>
<tr>
<td>Ende Compile</td>
<td>6</td>
<td>Compiler process complete.</td>
</tr>
<tr>
<td>printf aus Aktionen</td>
<td>3</td>
<td>Printf() outputs</td>
</tr>
<tr>
<td>Begin Disconnect dwAppID:</td>
<td>6</td>
<td>An application logs out from the script control.</td>
</tr>
<tr>
<td>ChangeFct</td>
<td>6</td>
<td>Function was changed.</td>
</tr>
<tr>
<td>LoadFct</td>
<td>6</td>
<td>Reloading a function</td>
</tr>
<tr>
<td>DirInfo.szProjectLibDir:</td>
<td>6</td>
<td>Project functions path</td>
</tr>
<tr>
<td>DirInfo.szGlobalLibDir:</td>
<td>6</td>
<td>Path of standard functions and internal functions</td>
</tr>
<tr>
<td>m_szIncludepathProj</td>
<td>6</td>
<td>Project path for a compiler include</td>
</tr>
<tr>
<td>m_szIncludepath</td>
<td>6</td>
<td>General path for a compiler include</td>
</tr>
<tr>
<td>Thread said goodbye</td>
<td>1</td>
<td>A job thread has ended unexpectedly.</td>
</tr>
<tr>
<td>Exception in Request</td>
<td>1</td>
<td>An error has occurred in a request.</td>
</tr>
<tr>
<td>Timeout Variable ist nicht gekommen</td>
<td>1</td>
<td>Tag request was not answered within 10 seconds.</td>
</tr>
</tbody>
</table>

### 6.4.2 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

<table>
<thead>
<tr>
<th>Number</th>
<th>Type</th>
<th>Short description in Alarm Logging</th>
<th>Text in diagnosis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1007000</td>
<td>3</td>
<td>Overflow</td>
<td>ActionOverflow: more than 10000 Actions to work</td>
<td>Overflow, more than 10000 actions in the queue.</td>
</tr>
<tr>
<td>1007001</td>
<td>3</td>
<td>Action error</td>
<td>ExecuteError in Action %s (Functionsname)</td>
<td>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.</td>
</tr>
<tr>
<td>1007001</td>
<td>3</td>
<td>Action error</td>
<td>10 errors occurs, no more errors will be reported</td>
<td>One of the above faults has occurred 10 times and will no longer be logged for performance reasons.</td>
</tr>
<tr>
<td>1007002</td>
<td>3</td>
<td>Overflow</td>
<td>DM_queue overflow</td>
<td>Overflow of an internal list.</td>
</tr>
<tr>
<td>1007003</td>
<td>2</td>
<td>Connection error</td>
<td>no connection to server %s (Servername)</td>
<td>The connection to the server is broken. Measure: Start server again.</td>
</tr>
<tr>
<td>1007004</td>
<td>3</td>
<td>Action error 1</td>
<td>Function %s (Functions-name) unknown</td>
<td>Unknown function.</td>
</tr>
<tr>
<td>1007004</td>
<td>3</td>
<td>Action error 1</td>
<td>10 errors occurs, no more errors will be reported</td>
<td>The above fault has occurred 10 times and will no longer be logged for performance reasons.</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>no PCode</td>
<td>A Global Script action or a function contains no executable code (P-Code). Measures: Compile action or function.</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>Error in FunctionName</td>
<td>The function name is incorrect.</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>wrong ReturnType</td>
<td>The Return value type is invalid.</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>Fault in LoadAction</td>
<td>Compiler error when loading the action.</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>Fault in OpenFunktion %s (Dateiname der Funktion)</td>
<td>A function could not be loaded.</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>Fault in LoadFunktion %s (Dateiname der Funktion) error: %s (Fehlerursache)</td>
<td>A function could not be loaded. Measures: Correct the fault cause indicated in the diagnosis entry.</td>
</tr>
<tr>
<td>Number</td>
<td>Type</td>
<td>Short description in Alarm Logging</td>
<td>Text in diagnosis</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
<td>-----------------------------------</td>
<td>-------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>Fault in LoadFunktion new_function error: &quot;new_function&quot;: doubly defined function</td>
<td>Two *.fct files are using the same function name in the directory &quot;&lt;Project&gt;\Library&quot;. Measures: When executing menu command &quot;Regenerate header&quot; in the Global Script, you are notified of the duplicate file name.</td>
</tr>
<tr>
<td>1007005</td>
<td>3</td>
<td>Action error 2</td>
<td>10 errors occurs, no more errors will be reported</td>
<td>One of the above faults has occurred 10 times and will no longer be logged for performance reasons.</td>
</tr>
<tr>
<td>1007006</td>
<td>3</td>
<td>Tag error</td>
<td>Variable %s not exist</td>
<td>Requested tag does not exist.</td>
</tr>
<tr>
<td>1007006</td>
<td>3</td>
<td>Tag error</td>
<td>Variable %s timeout</td>
<td>Tag request was not answered within a certain amount of time.</td>
</tr>
<tr>
<td>1007006</td>
<td>2</td>
<td>Tag error</td>
<td>10 errors occurs, no more errors will be reported</td>
<td>One of the above faults has occurred 10 times and will no longer be logged for performance reasons.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>FindFirstFile INVALID_HANDLE_VALUE GetLastError() %d</td>
<td>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.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>Alles vorbei INVALID_HANDLE_VALUE GetLastError() %d</td>
<td>The second access attempt failed. The SCRIPTFCT directory and the functions and header files contained within are not available. Possible causes: Network is faulty, no current ServicePack for NT or changed access authorization.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>countall %d in szFolder %s</td>
<td>Number of functions in one directory.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>before Read Standardfunction</td>
<td>Before reading the standard functions.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>runtimeproject %s ok(getprojectdir) %d</td>
<td>Project path definition.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>global %s szProjectLibDir %s</td>
<td>The global path and the project path are output.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>count StandardFunctions: %d</td>
<td>Number of standard functions.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>count StandardFunctions +ProjectFunctions: %d</td>
<td>Number of standard and project functions.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>DM_NOTIFY_SHUTDOWN</td>
<td>Request, to end runtime.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>RemoveClient</td>
<td>A client has disabled the connection.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>InstallClient ok</td>
<td>Communication Client/Server disabled.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>InstallClient no ok</td>
<td>A client was not able to establish communication with the server.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>no client</td>
<td>Client not logged in.</td>
</tr>
<tr>
<td>Number</td>
<td>Type</td>
<td>Short description in Alarm Logging</td>
<td>Text in diagnosis</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
<td>-----------------------------------</td>
<td>--------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>vor share</td>
<td>Multi-user project: Before enabling directly ..\Siemens\WinCC\aplilib.</td>
</tr>
<tr>
<td>1007007</td>
<td>1</td>
<td>Info</td>
<td>nach share</td>
<td>Multi-user project: After enabling directly ..\Siemens\WinCC\aplilib.</td>
</tr>
<tr>
<td>1007007</td>
<td>3</td>
<td>Action error 2</td>
<td>Deactivation : Action was stopped by script</td>
<td>An action was still running 50 s after ending runtime and was deactivated.</td>
</tr>
<tr>
<td>1007008</td>
<td>3</td>
<td>Action error 2</td>
<td>EndAct Timeout</td>
<td>An action was not able to log out within one minute and was therefore ended.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Example: An action with a longer runtime was started and changed to another picture. The action will be ended after one minute.</td>
<td></td>
</tr>
<tr>
<td>1007009</td>
<td>3</td>
<td>Error in thread</td>
<td>Thread said good-bye</td>
<td>A job thread has ended unexpectedly.</td>
</tr>
<tr>
<td>1007009</td>
<td>3</td>
<td>Error in thread</td>
<td>APDMConnect-Thread said good-by</td>
<td>The thread that prepares the connection between the script control, tag management and other applications was ended unexpectedly.</td>
</tr>
</tbody>
</table>
7.1 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 only run 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 198)
- Overview of the licensing (Page 194)
7.2 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 computer. 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

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 at a later time by means of the WinCC DVD and "Additional software" on a computer without WinCC, such as a license server.

Note

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.

During first transmission of a license key, the Automation License Manager creates a directory "AX NF ZZ" on the hard disk. The directory has the "system" and "hidden" properties and is automatically deleted when the last license key is removed.
A copy protection prevents the copying of license keys to a license data storage medium or hard disk. Encryption technology and alteration of the physical file structure prevent the "functional" copying of a license key for a protected program.

**NOTICE**

Do not change names and properties of the "AX NF ZZ" directory

You may change neither the name nor the properties of the "AX NF ZZ" directory 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.

---

**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 computer, it can only be used 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, for 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**

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 for both clients without a custom project as well as for clients with a custom project. Note the following:

- 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.

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 computer.

You can cumulate archive licenses. If you transfer several single archive licenses locally to a computer, 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.

<table>
<thead>
<tr>
<th>Installed licenses</th>
<th>Additionally purchased licenses</th>
<th>Licensed archive tags</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>WinCC RC (...)</td>
<td>-</td>
<td>512</td>
<td>Basic licenses included 512 Archiv-Tags</td>
</tr>
<tr>
<td>WinCC RC (...)</td>
<td>WinCC Archive (1500 Tags)</td>
<td>1500</td>
<td>The installed archive license includes the 512 Archiv-Tags of the basic license</td>
</tr>
<tr>
<td>WinCC RC (...)</td>
<td>WinCC Archive (5000 Tags)</td>
<td>6500</td>
<td>With an additional archive license, the 1500 Archiv-Tags are upgraded to 6500 Archiv-Tags.</td>
</tr>
</tbody>
</table>

**Avoiding errors when handling licenses**

You have to remove all license keys on the hard disk before you:

- Use a hard disk optimization program that moves fixed blocks.
- Format, compress or restore the hard disk.
- Install a new operating system on the computer.

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. You can find additional information under: "Restoring license key".

**See also**

- [Basic license types and license types in WinCC](Page 198)
- [Activating and testing ASIA licenses](Page 14)
7.3 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 computer 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".

Overview

The license keys are displayed in the "Manage" view. The column display depends on the selected view.

<table>
<thead>
<tr>
<th>Status</th>
<th>Family</th>
<th>Product</th>
<th>Version</th>
<th>Standard license type</th>
<th>License type</th>
<th>Validity</th>
<th>Number of license keys</th>
<th>License key</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SIMATIC NET</td>
<td>Industrial Ethernet SOFTNET-ST Loan</td>
<td>-</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Calendar Scheduler</td>
<td>7.4</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Connectivity Pack</td>
<td>7.4</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Event Notifier</td>
<td>7.4</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC IndustrialDataBridge Tags</td>
<td>-</td>
<td>Single</td>
<td>Count relevant</td>
<td>3000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Load Balancing</td>
<td>-</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Performance Monitor</td>
<td>7.4</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Performance Monitor Archive</td>
<td>-</td>
<td>Single</td>
<td>Count relevant</td>
<td>100</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC RC (102-400)</td>
<td>7.4</td>
<td>Floating</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Redundancy</td>
<td>7.4</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC Server</td>
<td>7.4</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIMATIC HMI</td>
<td>WinCC User Archives</td>
<td>7.4</td>
<td>Single</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Basic license types and license types

The following basic license types and license types are differentiated. The software behaves differently for different types.

<table>
<thead>
<tr>
<th>Basic license types</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>Standard license with no time restrictions; you can transfer it to any computer and only use it locally there. The type of use is determined from the Certificate of License (CoL). Licenses of the type &quot;Single&quot; can be upgraded and identified with &quot;SISL&quot; in the license key.</td>
</tr>
</tbody>
</table>
| Floating            | License with no time restrictions; you can transfer it to any computer and use it there. You can also obtain the license from a license server over the network. If a WinCC RC license is present locally and remotely, WinCC always uses the local license. Read the installation notes of the Information Server to learn about particular features related to the archive licenses for the SIMATIC Information Server. If the "floating" license is purchased via the network, you must also note the following points:  
  ● 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 computer for Runtime.  
  ● After disconnection, the program is restarted only after three hours in demo mode.  
  ● The first free license on the license server is assigned. You must therefore ensure that sufficient licenses of the "floating" type are available on the license server which license at least the number of tags required in the project. Otherwise, the requesting computer would be switched to demo mode. Example: The WinCC RC (65536) and WinCC RC (128) licenses are located on the license server. 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. Licenses of the "Floating" type can be upgraded and identified with "SIFL" in the license key. |
| PowerPack Upgrade   | This license is used to increase the number of PowerTags. Licenses of the "PowerPack Upgrade" type are identified with "SIPP" in the license key. |
| Upgrade             | This license is used to convert the current software version to a more recent version. Depending on the upgrade package, you can also upgrade several licenses. Licenses of the "Upgrade" type are identified with "SIUP" in the license key. |
### License Types and Description

<table>
<thead>
<tr>
<th>License Types</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count relevant</td>
<td>With this license, the use of the software is limited to the number of tags or clients specified in the agreement. In case of several licenses of the &quot;Count Relevant&quot; type, the objects listed under &quot;Validity&quot; are added together. Read the installation notes of the Information Server to learn about particular features related to the archive licenses for the SIMATIC Information Server. The Count Relevant License is identified by &quot;SIFC&quot; or &quot;SISC&quot;.</td>
</tr>
<tr>
<td>Trial</td>
<td>With these licenses, software utilization is limited to the WinCC Trial installation. The use is limited to 30 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 &quot;SITT&quot;.</td>
</tr>
<tr>
<td>Master License Key</td>
<td>With this license, the software may be used without restriction. The Master License Key is identified by &quot;SIEL&quot;.</td>
</tr>
</tbody>
</table>

See also

- [WinCC in the Demo Mode](#) (Page 201)
- [Overview of the licensing](#) (Page 194)
7.4 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.
7.5 How to manage licenses

Introduction

You manage the WinCC licenses with the Automation License Manager.

You 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.

Additional information is available in the online help of the “Automation License Manager”.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
</table>

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

If several 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 and not several 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 sticks or uncompressed hard disk drives.
- You cannot transfer licenses to RAM drives, disks, compressed hard disk drives, etc.
Transferring the 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 entry "Transfer.." 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 the 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 removing.
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 204)
7.6 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 202)".

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 202)
7.7 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 Windows start menu, select the "License Analysis" entry in the "SIMATIC > WinCC > Tools" folder. 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.
The "License.Log" and "LicenseLog.xml" diagnostic files

The "License.Log" and "LicenseLog.xml" diagnostic files display the licenses called by WinCC. If a license is missing, a corresponding entry is shown.

The files are located in the WinCC installation path in the "diagnose" folder that is automatically set up when WinCC is run for the first time.

See also

WinCC in the Demo Mode (Page 201)
7.8 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:


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 198)

Internet: Contact person database (http://www.automation.siemens.com/partner/index.asp)
7.8 Restore license key
8.1 Performance Data

Contents

This chapter provides important technical data and performance limits on WinCC V7.
8.2 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:

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Quantity</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server or redundant server pairs</td>
<td>18 servers</td>
<td>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.</td>
</tr>
<tr>
<td>WinCC clients without their own project</td>
<td>32 clients</td>
<td>Maximum of 64 WinCC clients without their own project in the WinCC system.</td>
</tr>
<tr>
<td>WinCC clients with their own project</td>
<td>32 clients</td>
<td>Maximum of 50 WinCC clients without their own project in the WinCC system.</td>
</tr>
<tr>
<td>Configuration example 1</td>
<td>32 clients + 3 Web clients</td>
<td>WinCC clients with their own project.</td>
</tr>
<tr>
<td>Configuration example 2</td>
<td>1 client + 150 Web clients</td>
<td>WinCC client with its own project.</td>
</tr>
</tbody>
</table>

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"
8.3 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.

<table>
<thead>
<tr>
<th></th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objects per picture</td>
<td>No limit</td>
</tr>
<tr>
<td>Levels per picture</td>
<td>32</td>
</tr>
<tr>
<td>Pictures (PDL files) per project</td>
<td>No limit</td>
</tr>
<tr>
<td>Instances of fixed faceplates in a process picture</td>
<td>31 instances of the same type picture</td>
</tr>
<tr>
<td>Picture size in pixels</td>
<td>10 000 x 10 000</td>
</tr>
<tr>
<td>Nesting levels of picture objects</td>
<td>20</td>
</tr>
<tr>
<td>Number of colors</td>
<td>Dependent on graphics card</td>
</tr>
</tbody>
</table>

Runtime

The performance data depends on the hardware implemented.

Process pictures with the following values were tested as typical scenario:

<table>
<thead>
<tr>
<th>Change picture from empty screen to...</th>
<th>Time, in seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picture with standard objects (100 objects)</td>
<td>1</td>
</tr>
<tr>
<td>Picture with 2 480 I/O fields (8 internal tags)</td>
<td>1</td>
</tr>
<tr>
<td>Picture with 1 000 I/O fields (1 000 internal tags)</td>
<td>1</td>
</tr>
<tr>
<td>Picture of 10 MByte size (bitmap)</td>
<td>1</td>
</tr>
<tr>
<td>Message window</td>
<td>2</td>
</tr>
<tr>
<td>Table with 4 columns, each with 120 values 1)</td>
<td>1</td>
</tr>
</tbody>
</table>

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"
8.4 Message system

Configuration

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configurable messages per server/single-user station</td>
<td>150 000</td>
</tr>
<tr>
<td>Process tags per message line</td>
<td>10</td>
</tr>
<tr>
<td>User text blocks per message line</td>
<td>10</td>
</tr>
<tr>
<td>Message classes (incl. system message classes)</td>
<td>18</td>
</tr>
<tr>
<td>Message types per message class</td>
<td>16</td>
</tr>
<tr>
<td>Message priorities</td>
<td>17 (0...16)</td>
</tr>
</tbody>
</table>

Runtime

The performance data can be limited by system resources.

<table>
<thead>
<tr>
<th>Runtime</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages per message archive</td>
<td>No limit</td>
</tr>
<tr>
<td>Messages per short-term archive list</td>
<td>1 000</td>
</tr>
<tr>
<td>Messages per long-term archive list</td>
<td>1 000 ¹</td>
</tr>
<tr>
<td>Messages per message window</td>
<td>5 000 ²</td>
</tr>
<tr>
<td>Continuous message load without loss (single-user station/server)</td>
<td>10/sec</td>
</tr>
<tr>
<td>Message surge (single-user station/server)</td>
<td>2 000/10 sec every 5 min ³</td>
</tr>
</tbody>
</table>

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.
8.5 Archiving system

Configuration

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend window or diagram window per picture</td>
<td>25</td>
</tr>
<tr>
<td>Configurable trends per trend window</td>
<td>80</td>
</tr>
<tr>
<td>Bar diagrams per diagram window</td>
<td>80</td>
</tr>
<tr>
<td>Tables per picture</td>
<td>25</td>
</tr>
<tr>
<td>Columns per table</td>
<td>12</td>
</tr>
<tr>
<td>Values per table</td>
<td>30 000</td>
</tr>
<tr>
<td>Archives per single user/server</td>
<td>100</td>
</tr>
<tr>
<td>Archive tags per single-user station/server 1)</td>
<td>80 000</td>
</tr>
</tbody>
</table>

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 performance is influenced by the number of values that are archived with Tag Logging Fast and Tag Logging Slow. If necessary, reduce the archived values of the databases.

Projects with the following values were tested as typical scenarios:

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Values/second 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archiving in database for server/single user (“Tag Logging Fast”)</td>
<td>5 000</td>
</tr>
<tr>
<td>Archiving in database for server/single user (“Tag Logging Slow”)</td>
<td>5 000</td>
</tr>
<tr>
<td>Trend printouts for each configured trend</td>
<td>The number of printed values is based on the number of values shown in WinCC OnlineTrendControl.</td>
</tr>
</tbody>
</table>

1) The specified values apply to archiving without signing-off of data.
8.6 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.

<table>
<thead>
<tr>
<th></th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total archives</td>
<td>No limit</td>
</tr>
<tr>
<td>User archive fields 1)</td>
<td>500</td>
</tr>
<tr>
<td>Data records per user archive</td>
<td>10 000</td>
</tr>
<tr>
<td>User archive views</td>
<td>No limit</td>
</tr>
</tbody>
</table>

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.)

<table>
<thead>
<tr>
<th></th>
<th>10 fields</th>
<th>500 fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>1 second</td>
<td>5 seconds</td>
</tr>
<tr>
<td>Read record: Click the control button to read the value to the corresponding tags.</td>
<td>1 - 2 seconds 1)</td>
<td>n seconds 2)</td>
</tr>
<tr>
<td>Write record: Click the control button to write the value to the corresponding tags and display the tag contents in I/O fields.</td>
<td>1 - 3 seconds 1)</td>
<td>n seconds 2)</td>
</tr>
<tr>
<td>Focus change from first to last record.</td>
<td>1 - 2 seconds</td>
<td>1 - 2 seconds</td>
</tr>
</tbody>
</table>

1) 10 fields with a total of 10 tags.

2) 500 fields with a total of 500 tags.
8.7 Reports (Report Designer)

Configuration

The performance data can be limited by system resources.

<table>
<thead>
<tr>
<th></th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configurable reports</td>
<td>No limit</td>
</tr>
<tr>
<td>Report lines per group</td>
<td>66</td>
</tr>
<tr>
<td>Tags per report (^1)</td>
<td>300</td>
</tr>
</tbody>
</table>

1) The number of tags per report is dependent on the performance of the process communication.

Runtime

<table>
<thead>
<tr>
<th></th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simultaneously running message sequence reports per server/client</td>
<td>1</td>
</tr>
<tr>
<td>Simultaneously running message archive reports</td>
<td>3</td>
</tr>
</tbody>
</table>
8.8 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.

<table>
<thead>
<tr>
<th></th>
<th>VBS</th>
<th>ANSI-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set color of 1,000 rectangles</td>
<td>220</td>
<td>1,900</td>
</tr>
<tr>
<td>Set output value of 200 I/O fields</td>
<td>60</td>
<td>170</td>
</tr>
<tr>
<td>Select a picture with 1,000 static texts which determine the object name and issue it as return value</td>
<td>460</td>
<td>260</td>
</tr>
<tr>
<td>Read 1,000 internal tags</td>
<td>920</td>
<td>500</td>
</tr>
<tr>
<td>Re-read 1,000 internal tags</td>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>Conduct 100,000 calculations 1)</td>
<td>280</td>
<td>70</td>
</tr>
</tbody>
</table>

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;
}
8.9 Process Communication

Introduction

The following table provides information on the possible configurations and maximum number of connections.

Note

The limit values listed in the table are also dependent on the performance capability of the system and the quantity structure of the WinCC project (e.g. number of process values/time unit).

<table>
<thead>
<tr>
<th>Communication channels in WinCC ¹)</th>
<th>PC-based ²)</th>
<th>MPI/Profibus Soft-Net ³)</th>
<th>MPI/Profibus Hard-Net ³)</th>
<th>Industrial Ethernet Soft-Net ³)</th>
<th>Industrial Ethernet Hard-Net ³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC S7 Protocol Suite ¹)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• MPI</td>
<td>---</td>
<td>8</td>
<td>44</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Soft-PLC</td>
<td>---</td>
<td>1</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Slot-PLC</td>
<td>---</td>
<td>8</td>
<td>44</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Profibus (1)</td>
<td>---</td>
<td>8</td>
<td>44</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Profibus (2)</td>
<td>---</td>
<td>8</td>
<td>44</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Named Connections</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>• Industrial Ethernet ISO L4 (1)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>• Industrial Ethernet ISO L4 (2)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>• Industrial Ethernet TCP/IP</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>SIMATIC S7-1200 ⁶)</td>
<td>64 ⁵)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SIMATIC S7-1500 ⁶)</td>
<td>128 ⁵)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SIMATIC S5 Programmers Port</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• AS 511</td>
<td>2 ⁴)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SIMATIC S5 Serial 3964R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• RK 512</td>
<td>2 ⁴)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SIMATIC S5 Profibus FDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• FDL</td>
<td>---</td>
<td>---</td>
<td>50</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SIMATIC S5 Ethernet Layer 4 + TCP/IP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Industrial Ethernet ISO L4 (2)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>60</td>
</tr>
<tr>
<td>• Industrial Ethernet ISO L4 (2)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>60</td>
</tr>
<tr>
<td>• Industrial Ethernet TCP/IP</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>SIMATIC 505 Serial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• NITP / TBP</td>
<td>2 ⁴)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SIMATIC 505 Ethernet Layer 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Communication channels in WinCC

<table>
<thead>
<tr>
<th>Communication channels in WinCC</th>
<th>PC-based</th>
<th>MPI/Profibus</th>
<th>MPI/Profibus</th>
<th>Industrial Ethernet</th>
<th>Industrial Ethernet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Ethernet ISO L4 (1)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>60</td>
</tr>
<tr>
<td>Industrial Ethernet ISO L4 (2)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>60</td>
</tr>
<tr>
<td>SIMATIC 505 Ethernet TCP/IP</td>
<td></td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Ethernet TCP/IP</td>
<td>--- ⁵)</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profibus FMS</td>
<td></td>
<td>---</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profibus DP (V0-Master)</td>
<td></td>
<td>---</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP 1</td>
<td>---</td>
<td>---</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP 2</td>
<td>---</td>
<td>---</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP 3</td>
<td>---</td>
<td>---</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP 4</td>
<td>---</td>
<td>---</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allen Bradley - Ethernet IP</td>
<td></td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAMP ⁷)</td>
<td>--- ⁵)</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitsubishi Ethernet</td>
<td></td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MELSEC Communication Protocol (MC protocol)</td>
<td>--- ⁵)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Modbus TCP/IP</td>
<td></td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Modbus TCP/IP</td>
<td>--- ⁵)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>OPC</td>
<td></td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Access</td>
<td>--- ⁵)</td>
<td>---</td>
<td>---</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>XML-DA</td>
<td>--- ⁵)</td>
<td>---</td>
<td>---</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>OPC Unified Architecture</td>
<td></td>
<td>---</td>
<td>---</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>Data Access</td>
<td>--- ⁵)</td>
<td>---</td>
<td>---</td>
<td></td>
<td>---</td>
</tr>
</tbody>
</table>

### Remarks

1) In principle, all communication channels can be combined with each other. However, the subordinate communication drivers can lead to limitations.

When the SIMATIC S7 Protocol Suite is used, a maximum of 64 S7 connections can be operated. A typical configuration contains 60 S7 connections, for example.

Examples:

- 8 S7 connections via "MPI" and 52 S7 connections via "Industrial Ethernet TCP/IP"
- 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).

7) CAMP = Common ASCII Message Protocol

"SIMATIC S7-1200, S7-1500 Channel" channel

Maximum number of WinCC systems per CPU:

<table>
<thead>
<tr>
<th>CPU &quot;S7-12xx&quot;</th>
<th>Number</th>
<th>CPU &quot;S7-15xx&quot;</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>S7-12xx V2.2</td>
<td>1</td>
<td>S7-1511</td>
<td>15</td>
</tr>
<tr>
<td>S7-12xx V3</td>
<td>3</td>
<td>S7-1513</td>
<td>23</td>
</tr>
<tr>
<td>S7-12xx V4</td>
<td>4</td>
<td>S7-1515</td>
<td>29</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>S7-1516</td>
<td>36</td>
</tr>
</tbody>
</table>

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.
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