SIEMENS

SIMATIC HMI

WinCC
WinCC Runtime Professional
Readme

System Manual

Online help printout

10/2018
Online help printout

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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Table of contents

Security information

1

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.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security 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

http://www.siemens.com/industrialsecurity (http://www.industry.siemens.com/topics/global/en/industrial-security/Pages/Default.aspx)

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

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

http://www.siemens.com/industrialsecurity

Passwords

Various passwords are set by default in WinCC. For security reasons, you should change these passwords.

- For HMI devices with version 12, the default password for the Sm@rtServer and for the embedded Web server is "100". A default password is not preset for HMI devices with version V13.
- For the user "Administrator", the default password is "administrator".

Integrated Web server

It is always possible on a PC to access HTML pages in Runtime, even though the option"HTML pages" is disabled. Setup always installs the standard pages of the Web Server on the PC. Assign an administrator password to prevent unauthorized access to the pages.

Communication via Ethernet

In Ethernet-based communication, end users themselves are responsible for the security of their data network. The proper functioning of the device cannot be guaranteed in all circumstances; targeted attacks, for example, can lead to overload of the device.

Use of SSL 3.0

For security reasons, the use of the protocol SSL 3.0 is not recommended on Comfort Panels or in Runtime Advanced. The use of the protocol SSL 3.0 is disabled by default on Comfort Panels. If you nevertheless wish to activate the use of SSL 3.0, select the following in Internet Explorer or in "Start Center > Settings: Internet Options > Advanced > Use SSL 3.0".

For RT Advanced, the use of SSL 3.0 can be disabled in Internet Explorer or in the Control Panel under "Internet Options > Advanced" by deactivating the "Use SSL 3.0" option.

Network settings

The following tables show the network settings of each product which you need in order to analyze the network security and for the configuration of external firewalls:

WinCC Professional (without simulation)					
Name	**Port number**	**Transport protocol**	**Direction**	**Function**	**Description**
ALM	4410*	TCP	Inbound, Outbound	License service	This service provides the complete functionality for software licenses and is used by both the Automation License Manager as well as all license-related software products.
HMI Load	1033	TCP	Outbound	HMI Load (RT Basic)	This service is used to transmit images and configuration data to Basic Panels.
HMI Load	2308	TCP	Outbound	HMI Load (RT Advanced)	This service is used to transmit images and configuration data to panels.
RPC	**	UDP	Inbound, Outbound	Client / server & ES communication (CCAgent)	This service is used by WinCC Professional and WinCC Runtime Professional.
* Default port that can be changed by user configuration ** Port is assigned automatically					

WinCC Simulation for Basic Panels					
Name	**Port number**	**Transport protocol**	**Direction**	**Function**	**Description**
HMI Load	1033	TCP	Inbound	HMI Load (RT Basic)	This service is used to transmit images and configuration data to Basic Panels.
EtherNet/IP	44818	TCP	Outbound	Ethernet/IP channel	The Ethernet/IP protocol is used for connections to Allen Bradley PLCs.
	2222	UDP	Inbound	Ethernet/IP channel	The Ethernet/IP protocol is used for connections to Allen Bradley PLCs.
Modbus TCP	502	TCP	Outbound	Modbus TCP channel	The Modbus TCP protocol is used for connections to Schneider PLCs.

WinCC Simulation for Basic Panels					
RFC 1006	102	TCP	Outbound	S7 channel	Communication with the S7 controller via Ethernet/PROFINET
Mitsubishi MC	5002	TCP	Outbound	Mitsubishi MC channel	The Mitsubishi protocol is used for connections to Mitsubishi PLCs.

WinCC Simulation for Panels and Runtime Advanced					
Name	**Port number**	**Transport protocol**	**Direction**	**Function**	**Description**
DCP	---	Ethernet	Outbound	PROFINET	The DCP protocol (Discovery and basic Configuration Protocol) is used by PROFINET and provides the basic functionality for locating and configuring PROFINET devices.
LLDP	---	Ethernet	Inbound, Outbound	PROFINET	The LLDP protocol (Link Layer Discover Protocol) is used by PROFINET for topology detection.
SMTP	25	TCP	Outbound	SMTP Communication	This service is used by WinCC Runtime Advanced to send e-mails.
HTTP	80*	TCP	Inbound	Sm@rtServer	The Web server is only available when Sm@rtService is activated. The used port may differ depending on automatically selected settings.
RFC 1006	102	TCP	Outbound	S7 channel	Communication with the S7 controller via Ethernet/PROFINET
NTP	123	UDP	Outbound	Time synchronization	The NTP protocol (Network Time Protocol) is used for time synchronization in IP-based networks.
SNMP	161	UDP	Outbound	PROFINET	The SNMP client functionality is used by STEP 7 to read status information from PROFINET devices.
HMI Load	2308	TCP	Outbound	HMI Load (RT Advanced)	This service is used to transmit images and configuration data to panels.
HTTPS	443*	TCP	Inbound	Sm@rtServer	The Web server with HTTPS protocol is only available when Sm@rtService is activated. The used port may differ depending on automatically selected settings.
VNC server	5900*	TCP	Inbound	Sm@rtServer	This service is only available when Sm@rtService is activated.
	5800*	TCP	Inbound	Sm@rtServer	This service is only available when Sm@rtService is activated.
VNC client	5500	TCP	Outbound	Sm@rtServer	This service is only available when Sm@rtService is activated.
* Default port that can be changed by user configuration					

WinCC Simulation for Runtime Professional					
Name	**Port number**	**Transport protocol**	**Direction**	**Function**	**Description**
RPC	**	UDP	Inbound, Outbound	Client / server & ES communication (CCAgent)	This service is used by WinCC Professional and WinCC RT Professional.
RPC	**	UDP	Inbound, Outbound	Client / server communication (CCEServer / CCEClient)	This service is used by WinCC Runtime Professional.
HTTP	80	TCP	Inbound, Outbound	Client / server communication (CCEServer / CCEClient)	This service is used by WinCC Runtime Professional.
RFC 1006	102	TCP	Outbound	S7 channel	Communication with the S7 controller via Ethernet/PROFINET
OPC UA	4840	TCP	Inbound	OPC UA server	This service is required for primary communication via OPC UA. It is activated and configured during installation.
OPC UA discovery	52601	TCP	Inbound	OPC UA server	This service provides information about the installed OPC server. It is installed and configured by the OPC UA server.
DCOM	135	TCP	Inbound	OPC server	This service is part of the Windows operating system. Since communication via OPC (DA) is based on DCOM, this service is required to initialize OPC (DA) connections.
DCOM	**	TCP	Inbound	OPC server	The communication via OPC (DA) is based on DCOM and uses unspecified ports assigned by the system. This should be taken into consideration when using OPC (DA) and creating rules for the firewall.
HTTP	80	TCP	Inbound	OPC server	This service is required for primary communication via OPC XML. It is activated and configured during installation.
NetBIOS	137	UDP	Inbound	OPC server	This service is part of the Windows operating system. Access to this service is required by OPC-Scout, for example, for browsing.
NetBIOS	138	UDP	Inbound	OPC server	This service is part of the Windows operating system. Access to this service is required by OPC-Scout, for example, for browsing.
SNMP	161	UDP	Outbound	SNMP OPC server	This service is used by the SNMP OPC server to change or query data on network drives, for example.
SNMP Traps	162	UDP	Inbound	SNMP OPC server	This service is used by the SNMP OPC server to query events from network drives, for example.
** Port is assigned automatically					

PROFINET protocols for Panels and Runtime Advanced					
Name	**Port number**	**Transport protocol**	**Direction**	**Function**	**Description**
DCP	---	Ethernet	Outbound	Lifelist, PROFINET Discovery and configuration	The DCP protocol (Discovery and basic Configuration Protocol) is used by PROFINET and provides the basic functionality for locating and configuring PROFINET devices.
LLDP	---	Ethernet	Inbound, Outbound	PROFINET Link Layer Discovery protocol	The LLDP protocol (Link Layer Discover Protocol) is used by PROFINET for topology detection.
MRP	---	Ethernet	Outbound	PROFINET medium redundancy	The MRP protocol (Medium redundancy protocol) enables control of redundant transmission paths using a ring topology.
PROFINET IO Data	---	Ethernet	Inbound, Outbound	PROFINET Cyclic IO data transfer	Cyclic data exchange is used by panels for direct keys and LEDs.
NARE	---	Ethernet	Inbound, Outbound	Name Address Resolution	This protocol is used to resolve network names and assign IP addresses.
PROFINET Context Manager	34964	UDP	Inbound, Outbound	PROFINET connection less RPC	The PROFINET Context Manager provides an endpoint mapper in order to establish an application relation (PROFINET AR).

Communication connections for Panels and WinCC Runtime Advanced					
Name	**Port number**	**Transport protocol**	**Direction**	**Function**	**Description**
Telnet	23	TCP	Inbound	Telnet	This service can be used for maintenance.
SMTP	25	TCP	Outbound	SendEMail	This service is used by Windows CE / PC Runtime to send e-mails.
HTTP	80*	TCP	Inbound	Hypertext Transfer Protocol	The HTTP protocol is used for communication with the internal Web server.
RFC 1006	102	TCP	Outbound	S7 channel	Communication with the S7 controller via Ethernet/PROFINET.
NTP	123	UDP	Outbound	Time synchronization	The NTP protocol (Network Time Protocol) is used for time synchronization in IP-based networks.
DCOM***	135	TCP	Inbound	OPC server	This service is a component of the Microsoft Windows operating system. Communication via OPC (DA) is based on DCOM. This service is therefore required to initialize OPC (DA) connections.
DCOM***	**	TCP	Inbound	OPC server	The communication via OPC (DA) is based on DCOM and uses unspecified ports assigned by the system. This should be taken into consideration when using OPC (DA) and creating rules for the firewall.

Communication connections for Panels and WinCC Runtime Advanced					
NetBIOS over TCP/IP	137	UDP	Outbound	With the use of Remote File Share	Register / log on to a remote server.
NetBIOS over TCP/IP	138	UDP	Outbound	With the use of Remote File Share	Register / log on to a remote server.
SNMP	161	UDP	Outbound	Simple Network Management Protocol	The SNMP client functionality is used by STEP 7 to read status information from PROFINET devices.
HTTPS	443*	TCP	Inbound	Secure Hypertext Transfer Protocol	The HTTP protocol is used for communication with the CPU-internal Web server via Secure Socket Layer (SSL).
Modbus TCP	502*	TCP	Outbound	Modbus TCP channel	The Modbus TCP protocol is used for connections to Schneider PLCs.
Mitsubishi MC	1025*	TCP	Outbound	Mitsubishi MC channel	The Mitsubishi protocol is used for connections to Mitsubishi PLCs.
Printing	1032	TCP	Outbound	Printing	Printing on the control panel (via Ethernet).
HMI Load	2308	TCP	Outbound	Transfer	This service is used to transmit images and configuration data to panels. On Comfort Panels, this service has been replaced by DeviceManager and SCS as of V13. This service is used to transmit configuration data to WinCC Runtime Advanced.
HMI Load	50523	TCP	Outbound	Transfer	This port is used if port 2308 is not available. This service is used to transmit images and configuration data to panels. On Comfort Panels, this service has been replaced by DeviceManager and SCS as of V13. This service is used to transmit configuration data to WinCC Runtime Advanced.
ALM	4410*	TCP	Inbound, Outbound	Application License Manager	This service of RT Advanced makes available the complete functionalities for software licenses and is used by the Automation License Manager.
OPC UA	4870*	TCP	Inbound	OPC UA server	This service is required for communication via OPC UA.
HMI Load	5001	TCP	Outbound	Device Manager	This service is used to transmit images and Runtime to panels.
HMI Load	5002	TCP	Outbound	SCS (System Configuration Server)	This service is used to transmit configuration data to panels.
VNC client	5500	TCP	Outbound	Sm@rtServer	VNC client connection
VNC server	5800*	TCP	Inbound	Sm@rtServer	VNC server connection HTTP
	5900*	TCP	Inbound	Sm@rtServer	VNC server connection
SIMATIC Logon	16389*	TCP	Outbound	UMAC (User Management to the Access Control)	Register / log on to a remote server.
Allen Bradley Ethernet IP	44818	TCP	Outbound	Ethernet/IP channel	The Ethernet/IP protocol is used for connections to Allen Bradley PLCs.

Communication connections for Panels and WinCC Runtime Advanced					
Reserved	49152 ... 65535	TCP/UDP	Outbound		Dynamic port range is used, for example, to connect to the remote file sharing.

* Default port that can be changed by user configuration

** Port is assigned automatically.

*** Supported by WinCC Runtime Advanced only.

Installation

2

Contents

Information that could no longer be included in the online help.

Virus scanners during installation

Virus scanners should be disabled during the installation of WinCC.

Installation on a computer with regional setting "Turkish"

If the computer is operated with the regional setting "Turkish" at the time of the installation, WinCC Runtime Professional cannot be started.

Security settings in the Security Controller

You can find the "Securitiy Controller" in the start menu under "Start > Programs > Siemens Automation". You can display and print security settings using the program.

However, do not use "Edit > Make settings" and/or the function "Make setting" in the menu.

Runtime 3

3.1 Notes on operation in Runtime

Contents

Information that could not be included in the online help and important information about product features.

Focus in runtime

If you have configured a low-contrast combination of focus color and border color for an HMI device with version 12.0.0 or earlier, the focus may no longer be identifiable in runtime after you change the device version in the TIA Portal. Change one of the two colors.

Language behavior - Layout of on-screen keyboard

The layout of the on-screen keyboard does not change when you switch to a runtime language that is not installed for the keyboard layout.

In this case, the language setting for the keyboard remains set at the most recent valid language or the language setting for the default keyboard layout of Windows is used.

Tag values exceed the maximum length

You enter a character string in a string tag via an I/O field. If the character string exceeds the configured number of tags, the character string will be shortened to the configured length.

Empty alarm texts

Runtime is running with a project. The project is saved on a network drive.

In the event of interruptions to the network drive connection, Runtime may attempt to load alarm texts from the network drive.

In the event of disconnection, the alarm window or the alarm view remains empty.

To avoid this, copy the project to a local drive before the starting the project in Runtime.

Duration of log initialization (Panels, RT Advanced)

Initialization of the logs on some storage media can take up to 5 minutes. The successful completion of initialization is immediately confirmed by a system event. If there is no storage medium for logging when Runtime starts, the appearance of the system event can also take up to 5 minutes.

Large logs delay the ending of Runtime (Basic Panels 2nd Generation)

When very large logs are used, ending Runtime can take a long time. Use segmented logs as an alternative to very large circular logs.

Slow reaction of SmartServer

The following programs may start and respond very slowly with Windows 7:

- HMI TouchInputPC
- SmartServer: <Ctrl+Alt+Del> shortcut in the logon dialog

The delay is caused by the callback for the Internet certificate validation.

Remedy:

You can find the following files
on the product DVD under:
Support\Windows7\CRL_Check or CD_RT\ Support\Windows7\CRL_Check\:

- DisableCRLCheck_LocalSystem.cmd
- DisableCRLCheck_CurrentUser.cmd

1. Run the "DisableCRLCheck_LocalSystem.cmd" file with administrator rights. Select the command "Run as administrator" from the shortcut menu of the file.
2. Reboot the PC.

If the problem persists, follow these steps:

1. Double-click the file and run the "DisableCRLCheck_CurrentUser.cmd" file with user rights.
2. Reboot the PC.

Note

The callback for the certificate validation is disabled for all users or PCs. To restore the original state, perform the following files:

- RestoreDefaults_LocalSystem.cmd
- RestoreDefaults_CurrentUser.cmd

You can find the files in the following directory of the product DVD:

- Support\Windows7\CRL_Check or CD_RT\Support\Windows7\CRL_Check\

Ending screensaver on the Sm@rtServer

When the screensaver is active on the Sm@rtServer on the server HMI device, you require write access to the Sm@rtClient side in order to end the screensaver on the server HMI device.

Avoiding corrupt files during power failure

If a power failure occurs in Windows systems while the WinCC system is active, files may be corrupt or destroyed. Operation with the NTFS file system provides better security.

Secure, continuous operation is only ensured by using an uninterruptible power supply (UPS).

3.2 Notes on operation of Runtime Professional

Contents

Information that could not be included in the online help and important information about product features.

User authorizations within the operating system

1. All user must be added to the "SIMATIC HMI" user group. This also applies to users who want to open WinCC projects remotely.
2. The storage folders of the projects must have the NTFS authorizations "SIMATIC HMI" with full access and "SIMATIC HMI Viewer" with read access. The authorizations must be inherited for all subordinate objects.
3. Members of the Windows user group "SIMATIC HMI" should not simultaneously be members of the Windows user group "SQLServerMSSQLUser$<Computername>$WINCC". The members of this group have administrator rights to the SQL server. Therefore remove all Windows users from this group for whom restricted access to the WinCC database is sufficient.

Windows 7: Locking shortcuts

If you want to lock shortcut keys in Windows 7, you must change the group policies in the administrative tools of the operating system.

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

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

Undocked toolbars

If the setting "Always on Top" is used for the Windows taskbar, undocked toolbars can be hidden behind the Windows taskbar in Runtime. Follow the steps below to show the toolbars again:

1. Select the "Properties" command in the shortcut menu of the taskbar.
2. Disable "Keep taskbar on top of other windows".

Fault in the connection between the server and the client

If the connection between the server and client is faulty, check the settings of the PG/PC interface. TCP/IP(Auto) should not be used for the "Interface Parameter Assignment Used". Used fixed IP addresses instead.

Fault in the connection between the server and the client

If the computer is simultaneously used as a server with the engineering system and a client cannot establish the connection to the server, you should check the releases set on the server.

1. Exit Runtime on the server.
2. Select the command "Find computer..." in the shortcut menu of the network environment on the desktop of the server.
3. Enter the name of the server as the computer to be found.
4. Open the computer found to see the released directories.
5. Remove all the releases that begin with "WinCC_Project_HMI". Information on this is available in the documentation for the operating system.

This malfunction is caused by the use of the command "Save as..." in conjunction with the startup of the Runtime of this new project. You can make copies of the projects for backup purposes using the "Save as..." command. You should, however, continue to work with the original project.

Starting WinCC Runtime Professional

If Engineering System and Runtime are operated on one computer, Runtime or simulation for a project opened in the Engineering System should only be started and ended using the TIA Portal. Other options, for example, the symbol in the taskbar information area, should not be used.

When you configure autostart on the client, you are required to enter the logon name and password for each registered server project. To assign each server a logon name, the entry of the respective project path must be confirmed with the "Apply" button. This means that you must enter a logon name and password twice for redundant or alternative projects.

Setting the services for the SQL server

In order to ensure the full functionality of the SQL server for WinCC and WinCC Runtime, you need to check the SQL server settings.

1. Start "Programme > Microsoft SQL Server 2014 > Configuration Tools > SQL Server 2014 Configuration Manager" in the Start menu.
2. Click "SQL Server Services" in the tree.
3. Check the services "SQL Server (WinCC)", "SQL Server (WINCCPLUSMIG)" and "SQL Server Browser". "Automatic" must be entered for "Start Mode". "LocalSystem" must be entered for "Log On As". Change the settings, if necessary.
4. Click "SQL Server Network Configuration" in the tree.
5. Click "Protocols for WinCC".
6. Check the "TCP/IP" protocol. "Enabled" must be entered for "Status". Change the settings, if necessary.

"Report system error" in WinCC Runtime Professional

The "Report system error" functionality is limited in WinCC Runtime Professional in conjunction with an S7-300 or S7-400. In an alarm view, only one alarm is ever displayed for each diagnostics type. Alarms on other errors of the same diagnostics type are not displayed.

WinCC interface and 64-bit operating system

The open interfaces of WinCC Runtime Professional do not offer native 64-bit support. Runtime API, VBS and the WinCC OleDB provider are primarily affected by this. To be able to use WinCC interfaces with a 64-bit operating system, note the following:
- VB scripts cannot be started by simply double-clicking. You must explicitly use the 32-bit version under "syswow64\wscript.exe".
- .NET applications that use the WinCC API have to be explicitly compiled as 32-bit applications, not with "AnyCPU", but with "x86".
- C++ applications must not be compiled as 64-bit applications.

Dynamic graphics in WinCCViewer RT

If you use dynamic graphics from a graphics collection, e.g. linked with scripts, these graphics are not updated in the WinCCViewer RT.

Select the "User-defined" option under "Runtime Settings > Graphic Settings".

Runtime Professional: Loading a project without connection to the configuration PC

Before you begin to load a project on the operator station, backup data such as "User administration" and "Recipe data".

1. User administration data are overwritten by default.
   Therefore, configure two buttons in your project for exporting and importing the user administration with the system function "ExportUserManagement". The data only needs to be exported if you have made changes to the user view in Runtime.
2. In the "Load preview" dialog, specify whether recipe data should be overwritten when loading the project.
   You can save recipe data in the recipe view using the operator controls "Export log" and "Import log".

Note that the most recently imported or loaded data are used in Runtime.

Operation on a network server

Operation of WinCC Runtime Professional on a network server (e.g. domain controller, file server, name utility server, software firewall, media server, exchange server) is not permitted.

Connection with S7-1200 in system diagnostics

Only a WinCC Runtime Professional HMI system can be connected with an S7-1200 (up to V3) when you use system diagnostics.

Disabling automatic checking for software updates

If the Engineering System is installed together with Runtime on a PC, the operator gets notifications above software updates. For the system to run reliably on a multi-user system, the same software version must be installed on all PCs.

It is possible to disable the automatic checking for software updates and to thus improve performance.

To disable the automatic checking for software updates, go to "Settings > General > Software updates" and clear the "Check daily for updates" check box.

Restriction in the online delta loading capability

When you replace a design, the online delta loading capability of the project is lost. TIA Portal does not output an error message in this case.

Screen objects in reports as PDF

The quality of the screen objects in the reports that you generate in Runtime as PDF files depends on the PDF printer drivers used.

Projects in Runtime after Windows 10 update

You have installed Windows 10 version 1709 on a PC with WinCC Professional V15 and a PC with WinCC Professional RT V15. You have performed a Windows 10 update to version 1803 on the Runtime PC. After the Windows 10 update, it may no longer be possible in Runtime to manually open a project loaded from the engineering system PC.

Remedy: Set the start type of the service for the WinCC SQL instance manually to "Automatic (Delayed Start)" and restart the system.

3.3 Communication

Contents

Information that could no longer be included in the online help.

Communication of Runtime Professional with SIMATIC S7-1200

In productive operation, communication of WinCC Runtime Professional with SIMATIC S7-1200 is only released for single-user systems.

Options

4

4.1 DataMonitor

Contents

Information that could no longer be included in the online help and important information about product features.

Removal of WinCC Runtime

If you also want to use DataMonitor after removing WinCC Runtime Professional, you have to perform a repair of the installation as follows:

1. Open the Control Panel.
2. Double-click on "Add/Remove Programs".
3. Select "SIMATIC WinCC/DataMonitor client" in the list of programs installed
4. Click on the "Change/Remove" button.
5. Select the setting "Repair" in the WinCC DataMonitor setup.

Name of the user groups

The name of the user groups differs at certain locations of the Online Help from the actually created user groups. The following assignment is valid:

SIMATIC Report Administrators corresponds to DM_Admin

SIMATIC Report Users corresponds to DM_User

Excel-Workbook on a PC with Windows 7

If you operate Excel-Workbook on a PC with Windows 7, you need to disable the "Aero Glass" display mode.

Importing configuration data

If you load a project to a device via an external data medium, DataMonitor cannot export a correct XML file on this device.

The exported XML file can then no longer be used for importing configuration data.

Channel diagnostics view

The "Channel diagnostics view" object is not supported by the option WinCC DataMonitor.

4.2 WebNavigator

Contents

Information that could not be included in the online help and important information about product features.

Removal of WinCC Runtime

If you also want to use WebNavigator after removing WinCC Runtime Professional, you have to perform a repair of the installation as follows:

1. Open the Control Panel.
2. Double-click on "Add/Remove Programs".
3. Select "SIMATIC WinCC/WebNavigator client" in the list of programs installed
4. Click on the "Change/Remove" button.
5. Select the setting "Repair" in the WinCC/WebNavigator setup".

WebNavigator Client Manual logoff

Users can now also log off manually from the WebNavigator client using the ODK function "PWRTLogout()". You can find one description of the function in the Runtime API documentation under "Functions of the user administration > Functions for logon, logoff".

Virus scanner Trend Micro OfficeScan

It is not recommended to use the virus scanner of Trend Micro OfficeScan in combination with WebNavigator, as this virus scanner may have an adverse impact on screen loading times.

ProDiag overview, GRAPH overview and PLC code view

The WinCC option Web Navigator does not support the use of the WinCC objects "GRAPH overview", "ProDiag overview" and "PLC code view".

Time zone of Web parts

When you create and configure a Web part in a specific time zone in the Web center, the time zone is stored in the Web center.

If the time zone is changed in the operating system, this can lead to an incorrect display of the time in the Web part.

Characters not permitted in WinCC WebNavigator

Use the characters of the ASCII character set in the picture names and project names. Do not use any special characters or national special characters.

Channel diagnostics

The object "Channel diagnostics" is not supported by the option WinCC WebNavigator.

Automatic trigger for SmartTags in scripts

Use the automatic trigger if you use SmartTags in scripts in the WebNavigator screens.

Delay when outputting the WebNavigator screens

Due to the Web server technology, it may occur that updated WebNavigator screens are output with a delay in Runtime.

New function for WebNavigator client

As of TIA Portal Version V15.1, you have the option to define a start screen and a start language for WebNavigator client in the ActiveX control UserAdminControl.

4.3 Redundancy

Contents

Information that could not be included in the online help and important information about product features.

Name in configuration of a redundant system

Only the computer name of the HMI devices is relevant for the configuration of a redundant system. You set the computer name of the HMI device in its operating system. The name of the HMI device from the project tree is only used for identification of the HMI device in the project.

Performance features of Runtime Professional 5

5.1 WinCC Runtime Professional (RT Professional)

WinCC Runtime Professional

The following tables of system limits help you assess whether your project conforms to the system limits of a given HMI device.

The specified maximum values are not additive. It cannot be guaranteed that configurations running on the devices at the full system limits will be functional.

In addition to the specified limits, allowances must be made for restrictions imposed by configuration memory resources.

Tags

	WinCC Runtime Professional
Number of tags in the project	500,000
Number of PowerTags	Depends on the license
Number of elements per array	2,000

Screens

It is possible that image files larger than 100 MB are not displayed in WinCC Runtime.

	WinCC Runtime Professional
Objects per screen [1)]	No limit [2)]
Layers per screen	32
Screens per project	No limit [2)]
Screen size in pixels	10,000 x 10,000
Screen object nesting	20
Number of colors	24-bit color depth, 8-bit alpha channel for transparency

1) The number and complexity of objects affects performance
2) Limited by system resources.

Alarms

	WinCC Runtime Professional
Configurable alarms per server/single-user station	150,000
Process tags per alarm line	10
User text blocks per alarm line	10
Alarm classes	256
Alarm priorities	17 (0...16)

Alarms in Runtime

	Maximum
Alarms per alarm log	No limit [1]
Alarms per historical alarm list (short-term)	1,000
Alarms per historical alarm list (long-term)	1,000 [2]
Alarms per alarm view	5,000 [3]

1) Limited by system resources.
2) On single-user station, or server or client per server if "LongTimeArchiveConsistency" has been set to "no". On single-user station, server, or client if "LongTimeArchiveConsistency" has been set to "yes".
3) On single-user station or server, or on client per server.

Note

Message bursts and continuous alarm load may be generated simultaneously on a single-user station or server.

Logs

	WinCC Runtime Professional
Trend view per screen	25
Trends per trend view	80
Values per trend view	A maximum of 134,217,728 bytes can be transferred from the Tag Logging Server to the Trend views. If a process value contains 20 bytes, approximately 6.7 million values can be displayed or exported to a *.csv file.
Table view per screen	25
Columns per table view	12
Values per table view	30,000
Logs per single-user station/server	100
Logging tags per single-user station/server [1]	80,000

1) Depends on the Logging PowerPack used for logging tags. The basic version contains 500 logging tags.

Note

Screen selection times may be extremely long in the event of multiple maximum values.

Recipes

	WinCC Runtime Professional
Number of recipes	No limit
Number of recipe elements [1]	500
Number of recipe data records	10,000
Number of views	No limit

1) Maximum 1,000,000 recipe elements in total

Example of a permissible configuration limit in Runtime

You reach the maximum number of 1,000,000 recipe elements, for example, with the following configurations:

- 10,000 recipe data records each with 100 recipe elements
- 2,000 recipe data records each with 500 recipe elements

Assumption: Each recipe element is connected to a tag.

Keep in mind that such configuration limits are also influenced by the hardware used and by other configurations.

Reports

	WinCC Runtime Professional
Configurable reports	No limit [1]
Report lines per detail view	66
Tags per report [2]	300

1) Limited by system resources.
2) The number of tags per report depends on the performance of process communication.

Reports in runtime

	Maximum
Alarm sequence reports running simultaneously per server/client	1
Alarm log reports running simultaneously	3

User management

	Maximum
Number of users	200

Communication

	S7-1200	S7-1511	S7-1513	S7-1516	S7-1518
Maximum number of WinCC system	2	20	30	41	62
ISO-on-TCP connections	-	64, 4 of which are reserved for ES	96, 4 of which are reserved for ES	128, 4 of which are reserved for ES	192, 4 of which are reserved for ES
Maximum number of connected PLCs per Runtime	64				
Maximum number of connected PLCs with Softnet via a network adapter	64				

- Note that a maximum of 200 tags per controller should be configured for communication with S7-1200 PLCs.
- If several HMI devices access a PLC, this limit applies for all HMI devices.
- You can learn how many HMI devices can simultaneously access a SIMATIC S7-1200 in the manual for the PLC.
  Entry ID: 36932465

Relation between HMI connection and connection resource

An HMI connection to WinCC RT Professional requires up to three connection resources.

Note

Different limits for connections over PROFIBUS and PROFINET

Note that connections over PROFIBUS have other limits regarding relations between the HMI connections and the connection resources than PROFINET.

For communication over PROFIBUS and SIMATIC NET you must also take into account the limits of the SIMATIC NET components (CPs).

You can find additional information about SIMATIC NET components in the respective SIMATIC NET manual: "PC software SIMATIC NET PC".

Configurations - configuration limits in the multi-station system

	WinCC Runtime Professional
WinCC clients in a system	32 [1) 2)]
Web clients in a system	150 [2) 3)]

1) The number of clients is reduced to four if the server also used as operator station.
2) Mixed configuration: 32 clients + 3 Web clients
3) Mixed configuration: 50 Web clients + 1 WinCC client

5.2 Orientation help for performance in Runtime (WinCC Runtime Professional)

WinCC Runtime Professional

The following tables help you to assess operational performance of your project in Runtime.

Note

The values specified greatly depend on the hardware used.

Screens in Runtime

Screen change from an empty screen to...	Time in seconds
Screen with standard objects (100 objects)	1
Screen with 2480 I/O fields (8 internal tags)	2
Screen with 1000 I/O fields (1000 internal tags)	1
10 MB screen (bitmap)	1

Screen change from an empty screen to...	Time in seconds
Alarm view	2
Table view with 4 columns, each with 120 values [1]	1

1) The values specified are valid for data from "Tag Logging Fast".

Alarms in Runtime

	Maximum
Continuous alarm load without losses (single-user station/server)	10/sec
Message burst (single-user station/server)	2000/10 seconds at intervals of 5 minutes [1]

1) Alarms are possibly lost if the interval before the next message burst is less than five minutes.

Note

Message bursts and continuous alarm load may be generated simultaneously on a single-user station or server.

Logs in runtime

	Maximum
Logging in database for server/single-user station (Tag Logging Fast)	5000 values/second [1]
Logging in database for server/single-user station (Tag Logging Slow)	1000 values/second [1] [2]
Number of values printed in a report	The number of values printed depends on the number of values displayed in the trend view.

1) The values specified are valid for logging data without signature.
2) With Tag Logging Slow, expect longer screen selection times for a given amount of data than for Tag Logging Fast.

Recipes in Runtime - boundary conditions

Hardware used	Software used	Configuration
Intel® Core™ i3-6100U 2.30 GHz	Windows 7	One WinCC tag per field
4 GB RAM	WinCC V14.0 SP1	300,000 entries each: - 10 fields with 30,000 data records - 500 fields with 600 data records
No hardware connection		

Recipes in Runtime - measured values

	10 fields	500 fields
Screen change to a screen with integrated recipe view. Result of measurement depends on the fill level of the control: It can take up to 15 seconds for complete display upon initial loading or if considerable configuration changes are made in the user log.	1 second	5 seconds
Read data record: Read the value to the corresponding tag after the button in the recipe view was clicked.	1 - 2 seconds [1)]	n seconds [2)]
Write data record: Write the value to the corresponding tag and display of the tag in the I/O field after the button in the recipe view was clicked.	1 - 3 seconds [1)]	n seconds [2)]
Focus change from the first to the last data record.	1 - 2 seconds	1 - 2 seconds

1) 10 fields with a total of 10 tags.
2) 500 fields with a total of 500 tags.

Reports in runtime

	Maximum
Alarm sequence reports running simultaneously per server/client	1
Alarm log reports running simultaneously	3

5.3 Orientation help for communication in Runtime (WinCC Runtime Professional)

WinCC Runtime Professional

Install the SIMATIC NET software from the supplied DVD. To use WinCC Runtime Professional with a S7-1200 / S7-1500 controller, you must not exceed the specific system limitations for the corresponding S7 controller. The following explains the system limits for tags, whose values are reported by an S7-1200/S7-1500. The "WinCC Channel Diagnosis" tool is used to make the determination.

Note

Refer to the parameter tables for the specific system limits of your S7-1200 / S7-1500 controller .

Attributes

Attribute	Description
Plc Attributes (max)	This value refers to the maximum number of tags that can be read cyclically. By default, the communication load of an S7 controller is not configured under 30% (default value: 50%).
Minimum Plc Attributes (free)	The "Minimum Plc Attributes (free)" value is based on empirical values. The value applies to the steady state with no screen change. The minimum number „Minimum Plc Attributes (free)" "may be temporarily lower. If the number approaches 0, cyclic reading with low cycle times begins, briefly slowing down communication with the S7 controller.
Number WinCC Runtime Professional	The "Number WinCC Runtime Professional" indicates the maximum number of WinCC Runtime Professional systems which can be connected to a S7 controller. The number includes a WinCC ES that is connected to the S7 controller.

Note

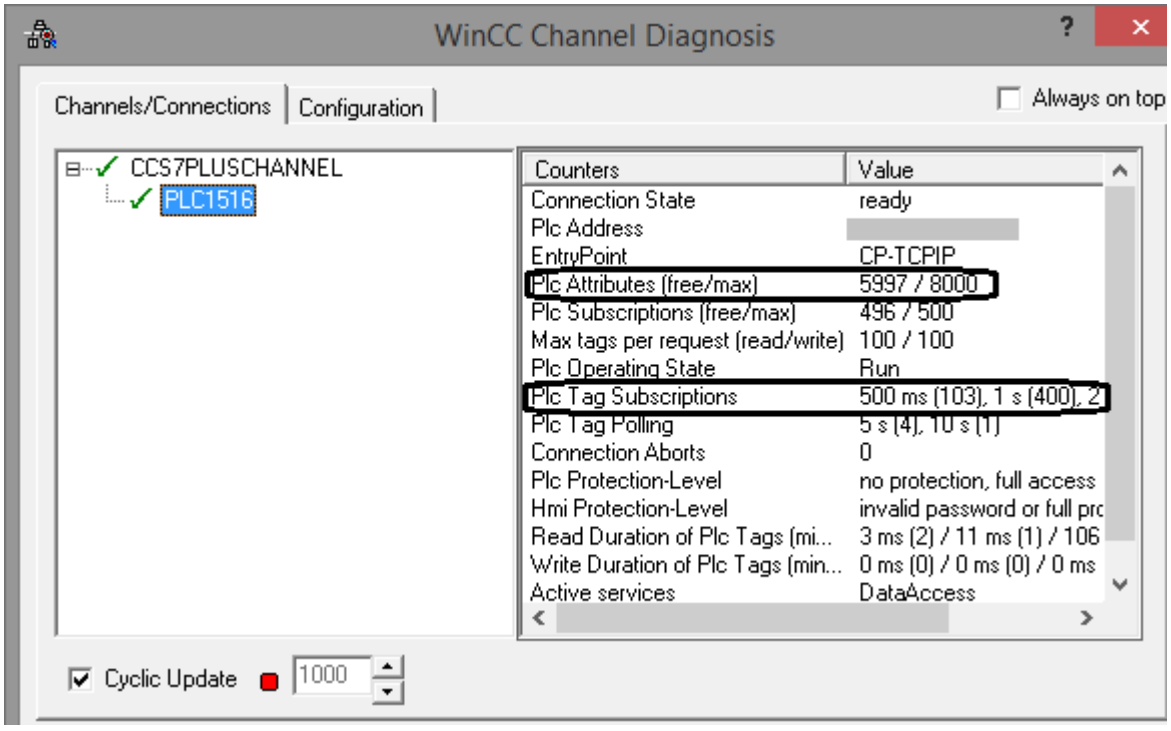
"Plc Attributes" can be used by one or more WinCC Runtime systems. The number of concurrent tags of all connected WinCC Runtime systems for each S7 controller therefore needs to be added up. You can learn how to determine the number of concurrent tags in the section "Critical factors of concurrent tags".

Example

Note

To ensure stable communication with the S7 controller, you should not exceed the "Number of concurrent tags per S7".

You can read the values for the "Plc Attributes (max)", "Minimum Plc Attributes (free)" columns of the parameter table from the WinCC Channel Diagnosis Tool under "CCS7PLUSCHANNEL" and the corresponding connection. The number of concurrent tags per S7 controller can be determined from the "Plc Tag Subscriptions" counter: The number of registered tags per cycle time is displayed. In the following example, the number of registered tags is 2003 (500 ms: 103 tags, 1 s: 400 tags, 2 s: 500 tags, 5 s: 1000 tags).



Critical factors of concurrent tags

The number of concurrent tags can be obtained from the following table. Cycle times less than 5 seconds are relevant here. Generally, only the tags which are detected by an S7 controller are relevant. In the example above, these are the tags of the "PLC1516" connection.

Functionality	Concurrent tags
Archiving	Sum of all tags per acquisition cycle.
HMI alarms	Number tags for discrete alarms + number tags for analog alarms + number associated values from tags per alarm.
Scheduler	Sum of all unused tags per cyclic event. With SmartTags, only the Smart Tags with cache usage are relevant. Number of trigger tags used.
Scripts	This affects cyclic scripts, specifically the functions within that use a cache. Information about using the cache is provided in the documentation. Examples: • HmiRuntime.Tags().Read 0. • SmartTags when using the cache. All affected tags are included in the count.
Screen	Number of tags directly related to object properties. Number tags used directly in controls with cycles (for example, gauge control, trend views, table views). Number of tags used in cyclic animations, C scripts, VB scripts. Number of trigger tags used.
OPC server (DA / UA)	Sum of all cyclically reported items.
Control Development	Sum of all cyclically read tags.

Index

H

P

S