

Readme

Programming and Operating Manual

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.

Table of contents

1	Notes on the TIA Portal.....	5
1.1	General notes.....	5
1.2	Notes on libraries.....	7
1.3	Notes on memory cards.....	7
1.4	Notes on the hardware configuration.....	8
1.5	Notes on instructions.....	9
1.6	Notes on online and diagnostics.....	9
2	STEP 7 Basic.....	11
2.1	Security information.....	11
2.2	Notes on use.....	12
2.3	Editing devices and networks.....	14
2.3.1	General information on devices and networks.....	14
2.3.2	Use of modules on the S7-1200.....	14
2.3.3	Replacing ET 200S positioning modules.....	15
2.3.4	CP 343-2 on SIMATIC S7 Embedded Controller EC31-RTX.....	16
2.3.5	F-CM AS-i Safety ST for ET 200SP.....	16
2.3.6	S7 routing via IE/PB Link.....	16
2.3.7	Notes on online and diagnostics.....	17
2.3.8	Network components.....	17
2.3.8.1	S7-1200 telecontrol CPs Load, TeleService, project number, station number.....	17
2.3.8.2	Security modules.....	18
2.3.8.3	Media converters.....	19
2.4	Programming a PLC.....	19
2.4.1	General notes on PLC programming.....	19
2.4.2	Compatibility of PLC programs from V12 SP1 or V13.....	22
2.4.3	Instructions.....	24
2.4.4	Testing the user program.....	28
2.4.4.1	Testing with the watch table.....	28
2.5	Inter Project Engineering (IPE).....	29
2.5.1	Notes on IPE.....	29
2.6	Technological functions.....	30
2.6.1	Notes on technological functions.....	30
3	WinCC Basic.....	33
3.1	Security information.....	33
3.2	News.....	34
3.3	Notes on use.....	35
3.4	Migration.....	37

3.5	Engineering System.....	41
3.5.1	Screens and Screen Objects.....	41
3.5.2	Tags and connections.....	47
3.5.3	Alarm system and alarm displays.....	49
3.5.4	System functions.....	50
3.5.5	Recipes.....	51
3.5.6	User administration.....	51
3.5.7	Communication.....	52
3.6	System-wide functions.....	54
3.7	Compiling and loading.....	55
3.8	Runtime.....	58
3.8.1	Notes on operation in Runtime.....	58
3.8.2	Notes on operation of panels in Runtime.....	60
3.9	HMI devices.....	62
3.9.1	Notes on HMI devices.....	62
Index		67

Notes on the TIA Portal

1.1 General notes

The information in this readme file supersedes statements made in other documents.

Read the following notes carefully because they include important information for installation and use. Read these notes prior to installation.

Display of Asian characters in the TIA Portal

Due to a change in behavior in Microsoft Windows, it may occur that texts are not displayed correctly in the TIA Portal when a Chinese TIA Portal is installed on another Asian operating system (e.g. Korean). To view the texts in TIA Portal correctly, open the Windows Control Panel and select "English" under "Language for non-Unicode programs". Note, however, that this may cause display problems in other programs.

Installing new .Net versions or .Net service packs

- Close the TIA Portal before installing a new .Net version or a new .Net service pack on your programming device/PC.
- Restart the TIA Portal only after successful installation of the new .Net version or the new .Net service pack.

Notes on handling

- If a project in the list of projects last used is located on a network drive that is not connected, you may experience delays when opening the "Project" menu.
- When you insert a CPU, you may need to wait for some time if the project editor is open at the same time. This generally takes longer when you insert the first CPU in a newly created project. To be able to continue working more quickly, you should close the project editor before inserting a CPU.
- The alarm "Application is not responding" may appear in Windows 7 with functions that take a long time to run (loading the CPU for example). If this occurs, wait until the function has correctly finished.
- If you have installed a Microsoft mouse with IntelliPoint, you may find that it superimposes components over the buttons of the title bar. If this is the case, uninstall the IntelliPoint software from Microsoft.
- Enabling the "Virtual Desktop" options with NVIDIA graphics cards can cause problems. In this case, disable the "nView virtual desktop manager" of your NVIDIA graphics driver.

1.1 General notes

Using the TIA Portal via a remote desktop

In principle, it is possible to use the TIA Portal via a remote desktop connection. During configuration, you should, however, avoid disconnecting the connection to the desktop client. In rare cases, this can lead to the software user interface being blocked.

If you experience this blockage, follow these steps on the desktop client.

1. Open the Windows Task-Manager and close the "rdpclip.exe" process.
2. Type in "rdpclip.exe" in the command prompt to restart the process.

Note that the current content of the clipboard will be lost. You can, however, then continue configuration as usual. To be on the safe side, you should restart the TIA Portal at the next opportunity.

Migration of projects with the TIA Portal

After the migration of hardware configurations and program blocks from earlier automation solutions, first check the functionality of the migrated project before you use it in productive operation.

Working with automatically synchronized network drives

Automatic synchronization after a network interruption can result in current (local) project data being stored as a "backup" on the network drive through user interactions. This could cause outdated project data to be loaded from the network drive when opening the project. For this reason, we do not recommend that you store TIA Portal projects on synchronized network drives.

If, however, you do work on synchronized drives, you can continue working locally in the event of a network interruption. In this case, you must always ensure that the TIA Portal application is closed while data is synchronized. The synchronization itself must be implemented in such a way that the current (local) project data replaces the project data on the network drive.

Entry of decimal places

With certain Windows language settings, it may occur that the entry of values with a comma as decimal place is not recognized (entering "1,23" leads to an error). Instead, use the international format ("1.23").

Information on the TIA Portal in online support

Overview of the most important technical information and solutions for the TIA Portal in the Siemens Industry online support.

Internet link: TIA Portal in Siemens Industry online support (www.siemens.com/industry/onlinesupport/tiaportal)

All information on service and support in the Siemens Industry online support:

Internet link: Service and support in Siemens Industry online support (<http://support.automation.siemens.com/WW/llisapi.dll?aktprim=99&lang=en&referer=%2fWW%2f&func=cslib.csinfo2&siteid=csius&extranet=standard&viewreg=WW&groupid=4000002>)

Here, you can also subscribe to the newsletter that provides you with latest information relating to your products.

Starting the TIA Portal

When you start the TIA Portal, Windows attempts to update the Certificate Revocation List (CRL) of "windowsupdate.com".

If no Internet access is available and there are multiple DNS servers, a timeout may occur and delay the start of the TIA Portal.

1.2 Notes on libraries

Contents

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

Comparing library elements

If master copies and types have the same name, the corresponding objects in the project are overwritten when the action "Copy" is used. Please note that this takes place without a prompt. The same behavior occurs when the name of the master copy is different to the name of the type, but an object within the master copy has the same name as the type.

1.3 Notes on memory cards

Contents

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

Notes on SIMATIC memory cards

The SIMATIC memory cards have been formatted and set up by Siemens for use with S7-1200 and S7-1500 modules. This format must not be overwritten; otherwise, the card will no longer be accepted by the modules. Formatting with Windows tools is therefore not permitted.

Behavior in case of open force job

Note that an active force job is retained even after you have loaded a new project to the SIMATIC memory card. This means you should first delete the active force job before you remove a SIMATIC memory card from the CPU and before you overwrite the card in the PC with a new project. If you use a SIMATIC memory card with unknown content, you should format the SIMATIC memory card before the next download.

Access protection for memory cards in USB card readers

By improving the security mechanisms for online access and engineering of S7-1500 CPUs, the data storage on memory cards has been changed. For this reason, this version of STEP 7 cannot evaluate the passwords of the configured protection level when reading project data from memory cards that is accessed via a USB card reader. The changed behavior affects the memory cards for CPUs of the S7-1200/1500 series. Therefore, use physical safeguards to protect critical project data on memory cards for these devices.

Note

This restriction is not related to online access to devices or the know-how protection of program blocks.

1.4 Notes on the hardware configuration

Content

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

Subnet addressing for CP 1613 and CP 1623

CP 1613 and CP 1623 are communication modules with microprocessor. To ensure secure management of communication links, these are processed on the module. The protocol stack in your PC is used for diagnostic purposes (SNMP, DCP). To allow both protocol stacks (i.e. CP 1613/23 Firmware and CP 1613/23 NDIS access) access to the same partners, is recommended to place both stacks of a module in the same subnet.

Editing a device IP address

Do not use the address range from 192.168.x.241 to 192.168.x.250 when editing a device IP address. If necessary, this address range is automatically assigned by the system to a programming device. Depending on the subnet mask, this applies also for all network classes.

Drivers for the CP 5512 communications processor

The drivers for the CP 5512 are no longer included in this software version. If you want to use the CP 5512, the following needs to be installed prior to the installation of this software:

<http://support.automation.siemens.com/WW/view/78453460> (<http://support.automation.siemens.com/WW/view/en/78453460>)

Please note that the CP 5512 can be used with a maximum of Windows 7 32-bit. As of Windows 8 or with 64-bit operating systems, the CP 5512 is not compatible.

Note

Since 2009, the functional successor the USB 2.0 module CP 5711 has been available.

1.5 Notes on instructions

Contents

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

Instructions not valid for all CPU firmware versions

The firmware version of your CPU determines the following:

- Whether a specific instruction is available for this CPU:
 - If you select CPU 1211C DC/DC/DC with firmware version V1.0, for example, the extended instruction "T_COMBINE" will not be available to you. It is grayed out in the "Instructions" task card.
 - However, if you select CPU 1211C DC/DC/DC with firmware version V3.0, the extended instruction "T_COMBINE" will be available to you in versions V1.1 and V1.2.
- Which versions of the instruction are available. You can select the different versions in the "Version" column of the "Instructions" task card.

1.6 Notes on online and diagnostics

Contents

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

Display of interfaces via online access

If the Ethernet interfaces for online access are not displayed sporadically, install hotfix KB2588507 (for Microsoft Windows) from the Microsoft Support website.

Internet link: <http://support.microsoft.com/kb/2588507> (<http://support.microsoft.com/kb/2588507/en-us>)

Online operation in hibernate mode

We recommend that you do not use the two options "Hibernate" and "Sleep" in online operation; if you do, communication problems could occur. If necessary, adapt the computer's energy options.

STEP 7 Basic

2.1 Security information

Upgrades and updates

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit

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

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit

<http://support.automation.siemens.com> (<http://support.automation.siemens.com/WWW/lisapi.dll?aktprim=99&lang=en&referer=%2fWWW/%2f&func=cslib.csinfo2&siteid=csius&extranet=standard&viewreg=WW&groupid=4000002>)

Network settings

The following tables show the network settings of each product you need to analyze the network security and to configure external firewalls:

STEP 7 Basic					
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.
RFC 1006	102	TCP	Outbound	S7 communication	Communication to the S7 controller via Ethernet/PROFINET for programming and diagnostic purposes.
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.

STEP 7 Basic					
SNMP	161	UDP	Outbound	PROFINET	The SNMP client functionality is used by STEP 7 to read status information from PROFINET devices.
* Default port that can be changed by user configuration					

WinCC ES Basic (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.
* Default port that can be changed by user configuration					

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

2.2 Notes on use

Content

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

Online operation

The simultaneous online operation of STEP 7 V5.5 or earlier and STEP 7 Basic V13 has not been approved.

Simultaneous online connections on an S7-1200 CPU

It is not possible to establish an online connection from multiple instances of the TIA Portal simultaneously to the same S7-1200 CPU.

Removing/inserting the memory card

After removing or inserting a memory card, always perform a memory reset on the CPU in order to restore the CPU to a functional condition.

Removing and inserting Ethernet modules

If Ethernet modules are removed and re-inserted during operation, you must boot the PC; otherwise, the "Accessible devices" functionality in STEP 7 or NCM PC will not display all devices. While the PC boots, Ethernet modules must be activated.

Loading project data with TIA Portal V12 and V13 (S7-1200)

If you load the project data of an S7-1200 CPU with the TIA Portal V13, you can no longer use TIA Portal V12 to access this data. To do this, first restore the factory settings of the CPU. Read the additional information on this in the online help under "How to reset a CPU to factory settings".

Using project data of distributed IO-Link master modules from TIA Portal V12 in V13

The following procedure applies if you are using distributed IO-Link master modules in TIA Portal V12 that are not GSD devices and were configured with PCT: To continue using your project data from TIA Portal V12.0 in TIA Portal V13.0, you have to export them to PCT before you upgrade the project. After the upgrade, you must import the project data once again using the PCT.

Compatibility

The device configuration and program of an S7-1200 CPU must always be configured with the same STEP 7 version. Usually, the TIA Portal makes sure that no version conflicts occur by outputting appropriate notifications during loading to the device.

This automatic verification is not possible with S7-1200 CPUs with firmware version V1.x. In this case, users themselves must ensure that no version conflicts occur.

See also

TIA-Portal_Link (<http://support.automation.siemens.com/WW/view/en/28919804/133000>)

2.3 Editing devices and networks

2.3.1 General information on devices and networks

Contents

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

S7 PCT IO-Link

The S7 Port Configuration Tool is available for free download at the following link.

<http://support.automation.siemens.com/WW/view/37936752> (<http://support.automation.siemens.com/WW/llisapi.dll?aktprim=0&lang=en&referer=%2fWW%2f&func=cslib.csinfo&siteid=csius&groupid=4000002&extranet=standard&viewreg=WW&nodeid=33102519&objaction=csopen>)

2.3.2 Use of modules on the S7-1200

Content

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

Use of modules on the S7-1200

The modules listed below are not supported on the S7-1200.

Family	Module	Order number
S7-300 FMs	SM 338	6ES7 338-4BC01-0AB0
	FM 350-1	6ES7 350-1AH03-0AE0
	FM 350-2	6ES7 350-2AH00-0AE0, 6ES7 350-2AH01-0AE0
	FM 351	6ES7 351-1AH01-0AE0, 6ES7 351-1AH02-0AE0
	FM 352	6ES7 352-1AH02-0AE0
	FM 355 S	6ES7 355-1VH10-0AE0
	FM 355 C	6ES7 355-0VH10-0AE0
	FM 355-2 C	6ES7 355-2CH00-0AE0
	FM 355-2 S	6ES7 355-2SH00-0AE0
S7-300 PtP-CP	CP 340	6ES7 340-1AH02-0AE0, 6ES7 340-1BH02-0AE0, 6ES7 340-1CH02-0AE0
	CP 341	6ES7 341-1AH01-0AE0, 6ES7 341-1AH02-0AE0, 6ES7 341-1BH01-0AE0, 6ES7 341-1BH02-0AE0, 6ES7 341-1CH01-0AE0, 6ES7 341-1CH02-0AE0

Family	Module	Order number
Network component	Diagnostics repeater	6ES7 972-0AB01-0XA0
ET 200S	1 Count 24 V	6ES7 138-4DA04-0AB0
	1 Count 5 V	6ES7 138-4DE02-0AB0
	1 Step 5 V	6ES7 138-4DC00-0AB0, 6ES7 138-4DC01-0AB0
	2 pulses	6ES7 138-4DD00-0AB0, 6ES7 138-4DD01-0AB0
	1 SI	6ES7 138-4DF01-0AB0
	1 SI Modbus	6ES7 138-4DF11-0AB0
	1 SSI	6ES7 138-4DB02-0AB0, 6ES7 138-4DB03-0AB0
	1 Pos Universal	6ES7 138-4DL00-0AB0
	SIWAREX	7MH4910-0AA01, 7MH4912-0AA01, 7MH4920-0AA01
ET 200M	SIWAREX	7MH4 900-2AA01, 7MH4 900-3AA01, 7MH4 950-1AA01, 7MH4 950-2AA01

Loading S7-1200 module comments to the PG/PC

In central configurations with S7-1200, comments of modules, submodules and signal boards are not loaded. With CPs/CMs, only the comments of the IE interface or DP interface are loaded. In distributed configurations with ET 200SP or ET 200MP, only the comment of the channels is loaded from the I/O modules.

2.3.3 Replacing ET 200S positioning modules

Contents

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

Replacing ET 200S positioning modules

This information relates to the positioning module "1 Step 5V" (6ES7 138-4DC00-0AB0) from a project which was created with TIA Portal V11.0. When replacing these modules from the TIA Portal V11.0 with a new version of these modules, the parameter settings are reset to the default values.

This is the case with one of the following procedures:

- Replace the positioning module 6ES7 138-4DC00-0AB0 with its successor module 6ES7 138-4DC01-0AB0 by means of a device exchange.
- Updating the module version using the appropriate button in the device properties in the Inspector window.

2.3.4 CP 343-2 on SIMATIC S7 Embedded Controller EC31-RTX

Contents

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

CP 343-2 on SIMATIC S7 Embedded Controller EC31-RTX

The module AS-Interface CP 343-2 (article no.: 6GK7 343-2AH01) can be inserted in an expansion rack of the SIMATIC S7 Embedded Controller EC31-RTX (article no.: 6ES7 677-1DDxx-0BB0), but the CP 343-2 cannot be operated with the EC31-RTX.

2.3.5 F-CM AS-i Safety ST for ET 200SP

Content

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

F-CM AS-i Safety ST (3RK7 136-6SC00-0BC1) from HSP0070

When using an F-CM AS-i Safety ST (3RK7 136-6SC00-0BC1) using HSP0070 in TIA Portal V13.0, after updating to Service Pack 1, the HSP0070 (F-CM AS-i Safety ST) must be updated to version V2.0. This is necessary to allow use of the module in TIA Portal V13 Service Pack 1.

2.3.6 S7 routing via IE/PB Link

Content

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

S7 routing via IE/PB Link

In the following situations, no routing via the IE/PB Link PN IO is possible:

- S7 routing between two CPUs of the S7-1500
- S7 routing of PG connections to CPUs of the S7-1200/1500
- S7 routing of HMI connections to CPUs of the S7-1200/1500

This behavior relates to the IE/PB Link with firmware version V2.1 (6GK1 411-5AB00).

2.3.7 Notes on online and diagnostics

Contents

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

Hardware detection followed by online connection

When the "Online > Hardware detection" command is performed for an unspecified CPU, the online configuration is not loaded from the CPU. If you do not load the configuration resulting from the hardware detection to the CPU, the device and network views will always show a difference between the offline and online configurations. It will appear that there are different configurations in the online and diagnostic views, although the MLFBs are identical in the actual CPU and the offline CPU.

2.3.8 Network components

2.3.8.1 S7-1200 telecontrol CPs Load, TeleService, project number, station number

Changing the project number or station number for the entire STEP 7 project

If you change the project number or the station number in the "CP identification" parameter group for a telecontrol CP, this parameter is changed for all CPs in the STEP 7 project.

Copying Security modules

Copying stations with activated Security functions to another project without activated Security functions is forbidden and can lead to serious inconsistencies.

Mobile wireless CPs: Download / TeleService

The following behavior applies to all mobile wireless CPs:

- CP 1242-7 (6GK7 242-7KX30-0XE0)
- CP 1242-7 GPRS V2 (6GK7 242-7KX31-0XE0)
- CP 1243-7 LTE-EU (6GK7 243-7KX30-0XE0)
- CP 1243-7 LTE-USA (6GK7 243-7SX30-0XE0)

Connection resources for TeleService

The TeleService function occupies a connection resource on the engineering station.

The function download to device or upload from device during a TeleService session occupies a second connection resource on the engineering station.

Download to device

Only use the "Download to device" function with the mobile wireless CP via a TeleService connection as follows:

1. Select the CP in STEP 7.
2. Select the "Online" > "Download to device" menu.
3. In the "Extended download" dialog that appears, select the TeleService interface.
4. Download the project data from the "Extended download" dialog.

Upload from device

The "Upload from device" function via a TeleService connection is supported by the mobile wireless CPs with the following TeleService server applications:

- TeleControl Server Basic as of version V3
- TeleService Gateway as of version V3

2.3.8.2 Security modules

Migration of projects with Ethernet CPs and activated security functions

In STEP 7 V5.5 projects that contain Industrial Ethernet CPs with activated security functions, the security settings are disabled during migration to STEP 7 Professional.

If necessary, follow these steps after the migration:

1. Activate the security functionality.
2. Configure the required security settings.

Migration of IP access protection lists when activating the security functions

An active IP access protection list is converted to firewall rules when security functions are activated. These rules are visible in advanced firewall mode and can be adjusted there. The advanced firewall mode is activated automatically.

Copying Security modules

Copying stations with activated Security functions to another project without activated Security functions is forbidden and can lead to serious inconsistencies.

Security online diagnostics of S7 CPs

Security online diagnostics of a CP with security capability is only possible if the online connection is established directly via the CP. If the online connection was established by STEP 7 via the CPU to the station, with the "Connect online" button on the security diagnostics page "Security" > "Status" of the security CP you can establish a direct connection to the CP to run security online diagnostics. As an alternative, you can also terminate the online connection to the CPU and enter the IP address of the CP in the "Station address" input box under the entry "Online access" in online diagnostics.

IKE mode

When negotiating the key in phase 1 the IKE mode "Main" should be preferred. This mode normally provides a reliable procedure compared with the "Aggressive" mode. One reason for using the "Aggressive" setting is when you have VPN groups with different pre-shared keys since only one pre-shared key is supported with the "Main" setting.

The IKE "Aggressive" mode should not be used in conjunction with certificates. In the IKE "Aggressive" mode, only use pre-shared keys.

The SOFTNET Security Client only supports the IKE "Main" mode.

A security module must not be used in VPN groups that use different IKE modes.

Downloading configuration data to an S7-300/400 via a VPN tunnel

When you download configuration data via the gigabit interface of a CP x43-1 Advanced to an S7-300/S7-400 station, the path via which the download takes place is stored in the project. If the project is then downloaded via a VPN tunnel established between a SCALANCE S module and the CP x43-1 Advanced, the download fails due to the changed path.

To download via the VPN tunnel, follow the steps below:

1. Using the "Go online" button, connect the engineering station to the gigabit interface of the CP x43-1 Advanced.
2. Disconnect the online connection to the CP x43-1 Advanced.
3. Download the project to the station via the gigabit interface of the CP x43-1 Advanced.

VPN tunnel establishment with 1200/1500 CPs capable of VPN

The establishment of VPN tunnel connections by 1200/1500 CPs capable of VPN with the authentication method "pre-shared key" is only possible if the VPN connection partner is also a 1200/1500 CP capable of VPN. The establishment of VPN tunnel connections by a 1200/1500 CP capable of VPN to all other VPN connection partners is only possible with the "certificate" authentication method.

2.3.8.3 Media converters

When you migrate a project, you need to reconfigure the media converters.

2.4 Programming a PLC

2.4.1 General notes on PLC programming

Content

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

Information about network security

For communications access between the TIA Portal and CPU or between HMI (except for HMI access using "GET/PUT communication") and CPU, there are integrated security functions. These provide greater protection from manipulation and higher access protection. To protect against unauthorized network access to a CPU with standardized communications access such as "GET/PUT", "TSEND/TRCV", "Modbus", "FETCH/WRITE", you should also take suitable additional measures (e.g. cell protection concept).

Renumbering PLC data types

For better performance, the S7 CPUs process PLC data types with numbers. The user is not aware of these numbers, because the system processes the numbers independently. This means number conflicts are automatically resolved. When using know-how protected blocks that use PLC data types, it may be useful to set up your own numbering system (recommended > 5000) because the automatic resolution of numbering conflicts may result in a password prompt (compilation required).

To renumber the default number of a PLC data type, follow these steps:

1. Open the project library in the "Libraries" task card.
2. Drag the compilable PLC data type to the "Types" folder.
The "Add type" dialog opens.
3. Enter the properties of the new type.
4. Click "OK" to confirm.
5. Right-click the PLC data type.
The shortcut menu opens.
6. Select "Edit type" in the shortcut menu.
7. Open the "PLC programming" task card once again.
The extension "in testing" is now added to the name of the PLC data type.
8. Right-click the PLC data type.
The shortcut menu opens.
9. Select "Properties" in the shortcut menu.
10. Change the number of the PLC data type in the "General" section.
11. Select "Release version" from the shortcut menu of the library.

The PLC data type now has the new number and can be used. The assigned number is retained even if the type of the PLC data type is revoked.

Generating external sources from blocks

When generating external sources from blocks, the changes made directly in the block interface to the default values of PLC data types are not exported to the sources. This means these values are not available when the sources are imported once again. The default values are applied instead. To prevent this loss of data for the modified default values, the changes must be made directly in the PLC data type and not in the block interface. In this case, the changes are also exported when generating external sources.

Indirect indexing of ARRAY components of data type bit string in SCL

In TIA Portal V13, you can address the components of an ARRAY for a CPU of the S7-1200 series in SCL with a tag of the data type BYTE, WORD or DWORD as index in addition to a tag of the integer data type if the IEC check is not set.

Explicit data type conversion in SCL

As of TIA Portal V13, the string is displayed with a leading sign during explicit data type conversion of SINT/INT/DINT/LINT_TO_STRING or WSTRING in SCL and transferred aligned to the left.

The result is an incompatibility with TIA Portal V12 SP1, in which the string was transferred aligned to the right during conversion.

Start value behavior during "Upload from device"

The start values that you have changed with the instruction "WRIT_DBL: Write to data block in the load memory" will be lost during execution of the action "Upload from device".

Online/offline differences in the project tree (S7-1200 FW V2.0 and V2.1)

If you use the instruction "WRIT_DBL: Write to data block in the load memory" to change a data block, the resulting difference between online and offline block is initially not displayed correctly by the symbols in the project tree. The difference is only shown when you terminate an online connection and then go back online.

Loading inconsistent programs to a device

In TIA Portal, it is not possible to download inconsistent programs to a device without a consistency check. During the loading process, all blocks of the program are implicitly checked and are compiled again in the event of inconsistencies. If, however, there are programs on your CPU which were loaded with earlier versions of STEP 7, these programs could demonstrate inconsistencies.

In this case, note the following:

If you load an inconsistent program from a device, you will not be able to load the program unchanged to the device afterwards, because a consistency check always takes place during the loading process and existing inconsistencies are corrected.

Process image of PTO/PWM outputs

Do not use PTO/PWM outputs in the process image (for example, for access in the user program, for online functions or in HMI). The update rate of the process image is much slower than the rate of the signal changes. The display in the process image therefore does not reflect the signal flow.

Monitoring blocks in LAD and FBD

If the start of the current path is outside the visible range, it may not be possible to determine the input value. In this case, the current path is shown grayed out.

Avoid using PLC data types generated by the system in libraries

Some instructions generate their own PLC data types during instancing which are saved in the "PLC data types" project folder. However, you should not use these system-generated PLC data types in any library, because they may be recreated by the system at any time and may result in an unfavorable system behavior.

Using global data blocks in assignments

It is not possible to assign the contents of a global data block to a structurally identical data block, e.g. using a move box.

2.4.2 Compatibility of PLC programs from V12 SP1 or V13

Content

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

Compatibility

You can continue to use in V13 SP1 all programs that were created with TIA Portal V12 SP1 or V13. However, because improvements were made to the compiler and errors corrected there in V13 SP1, it can occur in rare cases that the program reacts differently after the upgrade or that you have to adjust the program code manually. These cases are described in detail below.

In addition, you have the option of editing the project in compatibility mode. Compatibility mode is available for projects that were created with TIA Portal V12 SP1 and V13.

You can find additional information on the compatibility under "Compatibility of projects".

Instruction "S_CONV: Convert character string"

Der EN/ENO mechanism behaves differently in TIA Portal V13 SP1 than in TIA Portal V13.

In version V13, the ENO enable output returns the signal state "0" in case of error, even if you have deactivated the ENO enable output. If you have switched an additional instruction to the EN enable output, this is then not executed.

In version V13 SP1, the ENO enable output returns the signal state "1" in case of error, if you have deactivated the ENO enable output. If you have switched an additional instruction to the EN enable output, this is then executed as expected.

Instruction "MUX: Multiplex" (SCL)

Up to and including TIA Portal V13, the value of the tag at the input parameter was output unchanged as a function value, even if the K parameter had a negative integer. This behavior has changed in TIA Portal V13 SP1.

In TIA Portal V13 SP1, if you use the BOOL, STRING, DT or DTL data types at the input parameters of the MUX instruction and the K parameter is a negative integer, the value of the tag is changed.

Instruction "DEMUX: Demultiplex" (SCL)

Up to and including TIA Portal V13, no value was output at the OUTELSE output parameter if the value of the K parameter was < 0 . In contrast, the value of the IN input parameter was output at the OUTELSE output parameter if the value of the K parameter was $>$ available outputs. This behavior has changed in TIA Portal V13 SP1.

In the TIA Portal V13 SP1, if you specify at the K parameter a value that is outside the available outputs ($K < 0$ or $K >$ available outputs), then the value of the IN input parameter is output at the OUTELSE output parameter.

Function values (Return)

As of TIA Portal V13 SP1, more stringent syntax rules apply to function call:

It is checked that the function value (Return) is written in any case, even if multiple possible program paths can be run through in the function. Therefore, there is no longer any risk that the function values will accidentally not be written during runtime.

However, you may possibly receive syntax errors in functions during compiling, which it was still possible to compile without errors in V13. In such cases change the program code so that the function value is written in all possible program paths.

Example:

SCL

```
IF #MyIn1 = #MyIn2 THEN
    #Block_3 := #MyIn1 + 1;
END_IF;
```

In this example, the function value of "Block_3" is not written if the condition of the IF instruction is not fulfilled. The function value then contains an undefined value.

SCL

```
#Block_3 := #MyIn1;
IF #MyIn1 = #MyIn2 THEN
    #Block_3 := #MyIn1 + 1;
END_IF;
```

In this example the function value of "Block_3" is definitely written in the program, since "MyIn1" is set as default before the IF loop is completed.

Comparing the hardware data types HW_IO and HW_DEVICE

As of TIA Portal V13 SP1, there is a stricter syntax rule that is valid for the comparison of the data types HW_IO and HW_DEVICE:

Up until and including TIA Portal V13 it was possible to compare the data types HW_IO and HW_DEVICE directly with each other.

If you want to compare these data types in TIA Portal V13 SP1 you have to first create a tag of the data type HW_ANY in the section "Temp" for the block interface and then copy the LADDR (from data type HW_DEVICE) to the tag. It is then possible to compare HW_ANY and HW_IO.

EN/ENO mechanism for STRING conversion

Conversion	Description
Strg_TO_Chars: Convert character string to Array of CHAR	<p>The ENO enable output returns the signal state "0" even if you have deactivated the ENO enable output:</p> <ul style="list-style-type: none"> • For an invalid character at the CHARS parameter • For an invalid ARRAY index at the PCHARS parameter • If the sum of the PCHARS and STRG parameters exceeds the length of the target ARRAY.
Chars_TO_Strg: Convert Array of CHAR to character string	<p>The ENO enable output returns the signal state "0" even if you have deactivated the ENO enable output:</p> <ul style="list-style-type: none"> • If the sum of the PCHARS and CNT parameters exceeds the length of the source ARRAY.

2.4.3 Instructions

Content

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

Instruction "TRCV_C: Receive data via Ethernet"

Contrary to the information provided in the online help, the communication connection is terminated immediately, and not after sending data, when the CONT parameter is set to the value "0".

Instruction "T_CONFIG: Configure interface"

The CPU is restarted after you have executed the "Configure interface" instruction in order to change an IP parameter. The CPU goes to STOP mode, a warm restart is carried out and the CPU starts up again (RUN mode). Make sure that the control process is in a secure operating mode after the CPU has been restarted following execution of the "Configure interface" instruction. Uncontrolled operation can result in serious material damage or personal injury due to malfunctions or programming errors, for example. Non-retentive data could be lost.

Parameters ERROR and STATUS

ERROR	STATUS (DW#16#..)	ERR_LOC	Explanation
0	00000000	0	After the instruction has been executed successfully, the STATUS parameter "00000000" does not return any value.

Instruction "DataLogCreate: Create data log"

In addition to the values described in the online help, the RET_VAL parameter can also adopt the following values:

Error code (W#16#...)	Explanation
8B24	Invalid assignment at parameter HEADER (for example, bit memory used as memory area).
8C24	Invalid assignment at parameter DATA (for example, bit memory used as memory area).

Instruction "DPSYC_Fr: Synchronize DP slaves / Freeze inputs"

In addition to the values described in the online help, the RET_VAL parameter can also have the following value:

Error code (W#16#...)	Explanation
80A4	Communication on central PROFIBUS disrupted.

Instruction "Get_IM_Data: Reading identification and maintenance data"

The explanation for the values of the RET_VAL parameter described in the online help has been changed as follows:

Error code (W#16#...)	Explanation
80B1	No valid data available. (The I&M data is either not supported by the (sub)module or you have not configured I&M data for this device.)

Instruction "T_RESET: Resetting the connection"

In addition to the values described in the online help, the STATUS parameter can also have the following value:

Error code (W#16#...)	Explanation
7000	No job processing active.

Instruction "TCON: Establish communication connection"

In addition to the values described in the online help, the STATUS parameter can also have the following value:

Error code (W#16#...)	Explanation
80A1	The specified connection or the port is already being used.

Instruction "RD_ADDR: Determine the IO addresses from the hardware identifier"

Output of the IO addresses with packed addresses of an ET200

With packed addresses of an ET200. the first module of the pack group returns all addresses. For the other modules, the following is output with the PIADDR and PQADDR parameters:

- With PROFINET as address "0".
- With PROFIBUS as address "0". The error code 16#8090 (the hardware identifier of the module at the LADDR parameter is invalid.) is also output.

For the number of bytes of the inputs and outputs (parameters PICOUNT and PQCOUNT), "0" is output in each case.

Instruction "RD_LGADR: Determine the IO addresses from the hardware identifier"

Output of the IO addresses with packed addresses of an ET200

With packed addresses of an ET200. the first module of the pack group returns all addresses. For the other modules, the following is output with the PEADDR and PAADDR parameters:

- With PROFINET as address "0".
- With PROFIBUS as address "0". The error code 16#8090 (the hardware identifier of the module at the LADDR parameter is invalid.) is also output.

For the number of bytes of the inputs and outputs (parameters PECOUNT and PACOUNT), "0" is output in each case.

Notes on the use of "RecipeExport" and "RecipeImport"

- The instructions RecipeExport and RecipeImport are not suitable for applications in which special protection is necessary for the recipe data. For higher protection of the data use the recipe functions of HMI.
- The data block with the recipe data exported with RecipeExport can be located in work or load memory. If the data block is both in work memory as well as in load memory, the values from work memory are used.
- You can use different separators for the separators of the row values in the recipe. Note that if you open the CSV file with the exported recipe data, for example in Excel, commas can be replaced by periods and vice versa. The reason for this is that different languages use different decimal separators. This can have effect when importing CSV files. The following convention applies for RecipeImport; the first detected possible separator is assumed to be the separator for all values of a table row.
 - Example 1: If a semicolon is detected as the first separator, during import it is assumed that the semicolon is used as the separator for all further values. As the decimal separator with a value of the type REAL, a comma is then used.
 - Example 2: If a comma is detected as the first separator, during import it is assumed that the comma is used as the separator for all further values. As the decimal separator with a value of the type REAL, a period is then used.

If the recipe data record contains a character string, make use that the character string does not contain the separator you are using. With character strings, also make sure that they do not contain any control characters that specify a line break (with ASCII: LF, CR LF, CR).

Note: Spaces and tabs cannot be used as separators. They lead to error code 80B2 during import.

Notes on the use of data logs

Data logs are stored as a CSV file and can be opened using the Web server, for example in Excel. If you use character strings within a data log, make sure that you do not use any characters in the character strings that are also used as the separator for the row elements of the CSV file.

Instructions STRG_VAL and VAL_STRG

The instructions STRG_VAL and VAL_STRG are also available in the SCL programming language in V13 SP1 in contrast to the restriction in the online help.

Passing parameters to asynchronous executable blocks

Code blocks (FBs/FCs) and data blocks (DBs) can be created with different access types ("standard" and "optimized"). In code blocks, you can call any instructions. Many instructions (e.g. "WRIT_DBL" and "READ_DBL") are executed asynchronously. These blocks cannot be supplied with tags from TEMP because the data must not be changed during execution.

Ensure that you do not use these instructions in programs in which code blocks of different access types are called reciprocally. This could cause the following to occur:

- A structure from a standard data block is directly or indirectly passed to an optimized code block, which forwards this structure directly or indirectly to one of the blocks mentioned above.
- The reverse scenario, whereby a structure from an optimized code block is directly or indirectly passed to a standard data block, which forwards this structure directly or indirectly to one of the blocks mentioned above.

Otherwise a hidden copy of the passed data is created in TEMP, which leads to the asynchronous blocks returning a negative acknowledgment.

2.4.4 Testing the user program

2.4.4.1 Testing with the watch table

Content

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

Multiple access to the same CPU

Access to a CPU from a PG/PC is permitted only when a TIA Portal is open. Multiple access to the same CPU is not permitted and can lead to errors.

Loading data blocks during an active control job

Note

Loading changed data blocks during an active control job can result in unforeseen operating states. The control job continues to control the specified address, although the address assignment may have changed in the data block. Complete active control jobs before loading data blocks.

Testing programs converted from older STEP 7 versions

To monitor and test a program converted from an older STEP 7 version, you first need to compile and download the program with the current STEP 7 version.

2.5 Inter Project Engineering (IPE)

2.5.1 Notes on IPE

Contents

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

Comment box of the device proxy

Contrary to the description in the information system for the TIA Portal V13, with the "Inter Project Engineering" functionality, the comment field for a device proxy cannot be edited.

Restricted functionality

In the TIA-Portal V13, the "S7 GRAPH overview" and "PLC code display" functionality cannot be used in conjunction with the IPE device proxy.

Using system diagnostics in the device proxy

To use the "system diagnostics" function in an IPE device proxy, for example, a system diagnostics view, insert the PLC alarms as content of a device proxy.

2.6 Technological functions

2.6.1 Notes on technological functions

S7-1200 Motion Control - MC_Home

The motion control instruction "MC_Home" has been extended with the absolute value encoder adjustment:

- **Absolute encoder adjustment (relative)**
MC_Home.Mode = 6
The current position is shifted by the value of the parameter "MC_Home.Position".
The calculated absolute value offset is stored retentively in the CPU.
(<Axis name>.StatusSensor.AbsEncoderOffset)
- **Absolute encoder adjustment (absolute)**
MC_Home.Mode = 7
The current position is set to the value of the parameter "MC_Home.Position".
The calculated absolute value offset is stored retentively in the CPU.
(<Axis name>.StatusSensor.AbsEncoderOffset)

S7-1200 Motion Control - MC_WriteParam

Motion control instruction "MC_WriteParam" for drive connection via PROFIdrive/analog output:

Contrary to the statements in the online help, you cannot write parameters with "MC_WriteParam" which require a restart of the technology object.

S7-1200 Motion Control - MC_ChangeDynamic

You can only use the motion control instruction "MC_ChangeDynamic" for drive connection via PTO (Pulse Train Output).

S7-1200 Motion Control - Application cycle MC-Servo [OB91]

To avoid disruptions in the program execution on the CPU, set the application cycle depending on the number of used axes as follows:

Application cycle = number of axes x 2 ms

Number of axes	Application cycle
1	2 ms
2	4 ms
4	8 ms
8	16 ms

The SINAMICS G120 drive updates the drive process image every 4 ms. To improve control, set the application cycle of the MC-Servo [OB91] to 4 ms or to a multiple of 4 ms.

S7-1200 Motion Control - Overflow MC-Servo [OB91]

Contrary to the online help, the CPU does not go into STOP at overflow of the MC-Servo [OB91].

If necessary, you can set the CPU to STOP at overflow of MC-Servo [OB91] via a time-error OB (OB80).

S7-1200 Motion Control - Process image partition "OB Servo PIP"

For optimal control of all I/O modules (e.g. hardware limit switches) used by Motion Control, assign them to the process image partition "OB Servo PIP". The assignment causes the I/O modules to be processed simultaneously with the technology object.

A high-speed counter (HSC) used by Motion Control is automatically assigned to the process image partition "OB Servo PIP".

S7-1200 Motion Control - Renaming technology objects

In order to assure the consistency of your project, after you rename the technology objects, download the project to the CPU while it is in STOP. A name change includes when you delete a technology object and create a new technology object with a new name and data block number of the deleted technology object.

S7-1200 Motion Control - ErrorIDs and ErrorInfos

The ErrorInfo 16#003D is also displayed if a drive with an analog drive connection has turned off.

The ErrorInfo 16#002C has been supplemented for the ErrorID 16#820A:

ErrorID	ErrorInfo	Description	Solution
16#820A		It is not possible to restart the axis	
	16#0013	The axis is enabled in the user program	Disable the axis with the "MC_Power" instruction; restart again
	16#0027	The axis is currently being operated in "Manual control" (axis control panel)	Exit "Manual control"; restart again
	16#002C	The axis is not disabled.	Disable the axis; restart the command
	16#0047	The technology object is not ready for restart.	Download the project again.
	16#0048	Condition for restart of the technology object is not satisfied.	Disable the technology object.

PtP module with CM 1243-5 PROFIBUS Master

You have to make the following settings in the instance DB for the instructions when using the PtP-Module CM PtP RS232 BA, CM PtP RS422/485 BA, CM PtP RS232 HF, CM PtP RS422/485 HF and CM PtP with a CM 1243-5 PROFIBUS Master with firmware \leq V1.3.4:

- **Send_P2P**
max_record_len = 240
- **Modbus_Master**
Send_P2P.max_record_len = 240
- **Modbus_Slave**
Send_P2P.max_record_len = 240

WinCC Basic

3.1 Security information

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Any third-party products that may be in use must also be taken into account. For more information about industrial security, visit

<http://www.siemens.com/industrialsecurity> (<http://support.automation.siemens.com>)

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit

<http://support.automation.siemens.com> (<http://support.automation.siemens.com>)

Passwords

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

- For the user "Administrator", the default password is "administrator".

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.

Ending Runtime automatically

If automatic transfer is enabled on the HMI device and a transfer is started on the configuration PC, the running project is automatically stopped on the HMI device. The HMI device then switches autonomously to "Transfer" mode. Transfer mode may cause undesired reactions in the system.

After the commissioning phase, disable the automatic transfer function to prevent the HMI device from switching inadvertently to transfer mode. To block access to the transfer settings and thus avoid unauthorized changes, assign a password in the Control Panel.

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 Basic (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.

* Default port that can be changed by user configuration

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.
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.

See also

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

3.2 News

News about the TIA Portal

You can learn about the latest news about various topic areas of the TIA Portal in Siemens Industry Online Support.

All news concerning WinCC can be found here: News (<http://support.automation.siemens.com/WWW/view/en/88360672>)

3.3 Notes on use

Contents

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

Copying HMI devices with HMI connections

If you copy an HMI device with HMI connections to a PLC, the HMI connection in the new HMI device is not automatically connected to an existing PLC with the same name. This applies to copying within a project as well as copying across projects.

To access the PLC tag via HMI tag in the new HMI device, you have to complete the configuration of the HMI connection immediately after copying. Proceed as follows:

1. Open the "Devices & Networks" editor.
2. Connect the new HMI device to the desired network.
3. Open the connection table.
4. Select the HMI connection of the new HMI device.
5. Select the desired PLC under "Partner".

If you compile the new HMI device or connect additional PLC tags in between copying the HMI device and completing the connection, there may be some instances in which an additional HMI connection to the same PLC is created. This is especially true if you connect HMI tags with DB array elements.

Device replacement

After an HMI device has been replaced, you should check the appearance of the configured screens. Changing the size of the display may result in changes to the position and appearance of screen objects, e.g. recipe view and alarm view.

Device replacement - communication

If an HMI device is replaced, error messages of the type "... are not supported in the new configuration. and will therefore be removed" may be generated. These alarms refer to configured connections of the device and are triggered, for example, if the HMI devices have a different number of interfaces. These connections are marked red after a device replacement. If you would like to continue to use these connections, you have change the configuration of the connection. Proceed as follows:

1. Open the "Devices and Networks" editor.
2. Click "Network" in the toolbar of the network view.
3. Network the interface of the HMI device with the interface of the CPU.
4. Click in the table area of the network view on the "Connections" table.
5. Select the connection marked red.
6. Enter the new interface under "Properties > General > Interface" in the Inspector window.

Specifying the time of modification in the overview window

The times of modification displayed in the overview window only refer to changes to the object itself. Changes to subordinate objects, e.g. screen objects in a screen, do not cause the time of the last change to the screen to change in the overview window.

HMI device wizard

When you create a device with a color display using the HMI device wizard, the graphics of the navigation buttons may be displayed in black and white. This error only occurs, however, if the new device is created with the same name as a device with a monochrome display which has been deleted in the meantime.

You can avoid this error by always deleting the associated graphics in the Graphics collection whenever you delete a device from the project.

Objects with object references in the project library

Two copying methods can be used in WinCC flexible.

- With "simple copy" a WinCC flexible screen including an IO field, for example is copied. Only the object name of a tag configured on the IO field is copied, as this is a reference.
- With "copy", a screen, an IO field contained there and a tag configured on the IO field together with its properties are copied.

These two methods can also be used for storing an object in a library. Project libraries and the objects contained there are migrated during migration and can be used in WinCC.

In WinCC, however, only one copying method is available. With regard to tags, it functions like "simple copy" in WinCC flexible. With regard to graphics, graphics lists and text lists, it functions like "copy" in WinCC flexible.

If you stored objects with references to tags in a library in WinCC flexible, you must reconfigure the referenced objects when using them in WinCC.

Installing East Asian project languages on a PC without Asian operating system

If you select an East Asian project language on a PC that does not have an Asian operating system installed, the default font is marked as invalid in the "Runtime settings > Language & font" editor.

To resolve this problem, open the "Regional and Language Options > Languages" dialog in the Control Panel and enable the "Install files for East Asian languages" option.

Installation sequence for Startdrive

When you install Startdrive on a PC, adhere to the following installation sequence:

- Install STEP 7 V13.0.
- Install Startdrive.

Compatibility with V12 and V13

Empty projects are installed in the installation directory under `..\Portal V13\SampleProjects` to allow the TIA Portal to be opened in compatibility mode:

- V12.0.1.4 project with the name "TIA_Portal_Project_V12.0.1.4.ap12", so that TIA Portal V13 SP1 can be opened in V12 compatibility mode
- V13.0.0.3 project with the name "TIA_Portal_Project_V13.0.0.3.ap13", so that TIA Portal V13 SP1 can be opened in V13 compatibility mode

This project must be copied to a local directory with full access before it can be used. For more information on this, refer to FAQ ID 66027369.

File browser on a Windows 8 PC with touch screen

You can only operate the file browser dialog with a mouse, keyboard or on-screen keyboard (without using the touch function) on a Windows 8 PC with touch screen. We recommend using the file browser dialog of the Windows operating system with the help of a script on a touch screen PC with Windows 8.

Making characters available for HMI tags of the type WString/WChar

You define a string with which certain fonts can be displayed in a tag of the type WString or WChar. All characters used in the project are available to you.

When compiling the project, only the characters of a font that are actually used in the project are retained. Unused characters are removed when the project is compiled.

To be able to use fonts that are not installed on a panel, make the characters available as configured texts in a screen.

1. Create a new screen.
2. Insert a text box.
3. In the properties of the text box, set a font that contains characters that you wish to use later.
4. Insert the characters of the font that you wish to use later into the text box.

After the project is compiled, you can use the characters configured in the text in HMI tags of the type WString/WChar.

3.4 Migration

Contents

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

Project languages in WinCC

WinCC V13 does not support all project languages that were available in WinCC flexible, such as Arabic. If you receive an empty project as the result of your migration, you may want to check the set editing language. Do not set the project languages that are not supported as editing language in the source project. Proceed as follows:

1. Open the project with WinCC flexible.
2. Change the editing language to English, for example.
3. Save the project.
4. Restart the migration.

Migrating an integrated project with ProTool objects

The "PROTOOL option package(s) missing in STEP 7" error message output during migration of a WinCC flexible project that is integrated in STEP 7 indicates that WinCC flexible 2008 SP3 is installed on your system. Moreover, the project still contains objects that were configured using ProTool. Do not open the project with WinCC flexible 2008 SP3! Proceed as follows to migrate the project:

1. Copy the project to a computer on which WinCC flexible 2008 SP2 and STEP 7 are installed.
2. Open the project in the SIMATIC Manager.
3. Remove all ProTool objects from the project.
4. Execute the "Save as" command in the "File" menu.
5. Enable the option "With reorganization" in the "Save project as" dialog.
6. Click OK.
7. Copy the project back to the original computer.
8. Restart the migration.

Migrating a WinCC V7 project: Border line of rectangles

In a WinCC V7 project, you have configured a rectangle with the settings "Line weight = 1" and "Draw insider border = yes".

You then migrate the WinCC V7 project to WinCC V13. To have the rectangle displayed correctly, follow these steps.

1. Open the Inspector window of the rectangle.
2. Open the property list.
3. Disable "Widen border line inwards".

Progress bar

As long as the progress bar still shows a value of 100%, the software is still busy running remaining tasks such as the closing of references. The software will not respond to user input while this status is given.

Open a project created with WinCC V11

When you open a V11 project with a WinCC V13 version, it is no longer possible to open this project with an older version afterwards.

Managing third-party ActiveX controls

The migration also supports third-party ActiveX controls. However, the controls must be registered in the operating system. If an ActiveX control is not registered, migration is canceled.

If you save a project with the migration tool and perform the migration yourself on another PC, the controls must also be registered on this PC.

Migrating integrated projects with alarm views

An alarm view is enabled with all alarm classes in an integrated project. The alarm classes are disabled during migration of the project.

Once the migration of the project is completed, check the settings in the alarm view.

Enable the required alarm classes in the Inspector window of the alarm view if needed under "Properties > General".

Migrating more extensive projects from WinCC V7

We recommend the use of a 64-bit operating system for the migration of more extensive projects from WinCC V7.

To use the migration tool on a computer with a 64-bit operating system for large projects, start the tool via the command line with the parameter 64-bit, as in the following example:

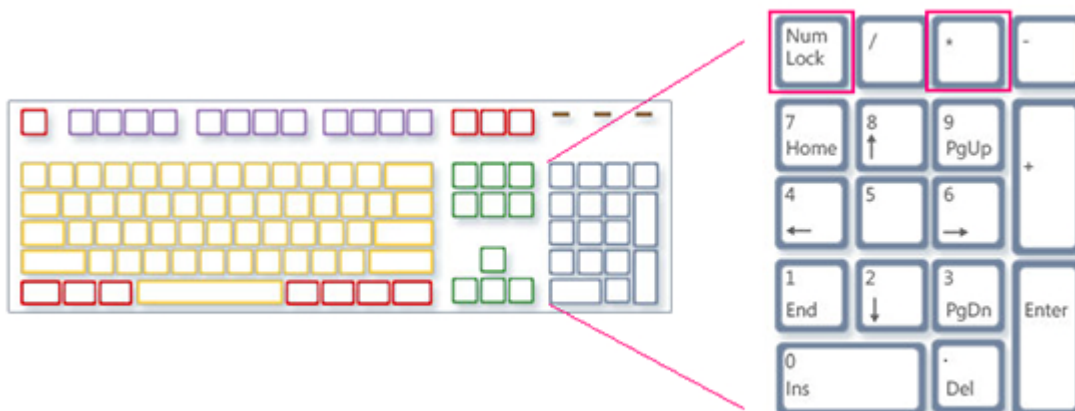
```
C:\Program Files (x86)\SIEMENS\Automation\MIGTOOL_V13\Bin  
\Siemens.Automation.MigrationApplication.exe 64bit
```

Migrating projects from WinCC V7

In TIA Portal V13, you can continue to use projects from WinCC V7.2 after migration. Projects from earlier WinCC versions cannot be migrated directly to WinCC TIA Portal version V13. If you wish to continue using such projects in TIA Portal V13, you must first migrate them to the WinCC V7.2 Classic page. To do so, use WinCC V7.2 with the latest update.

Migration log

As of TIA Portal V13.0 alarms are sorted into a tree structure in the migration log. This means all alarms that are part of a specific subsystem are stored in one folder. The result is an increase in the number of folders in the tree structure. Press the shortcut <NUM+ X> to expand the currently selected folder and all subfolders in one single step.



Restrictions for user-specific project data

1. Folders and files you have created in the WinCC V7.2 project directory are not copied to the new project directory during the migration. You must adapt all scripts that access such directories and files after the migration.
2. C standard functions of WinCC V7 are not migrated. If you have made changes to the C standard functions in the WinCC V7 project, you must apply these changes manually to the TIA Portal after the migration.

Migration of texts in Spanish (international sorting) and Spanish (traditional sorting)

If the WinCC V7 project includes texts in Spanish (traditional sorting), these texts are migrated as Spanish (Spain) in WinCC V13.

If the WinCC V7 project includes texts in Spanish (international sorting), these texts are migrated as Spanish (Spain) in WinCC V13.

If the WinCC V7 project includes texts in Spanish (international sorting) as well as Spanish (traditional sorting), only the texts from Spanish (traditional sorting) are migrated as Spanish (Spain) in WinCC V13. The texts from Spanish (international sorting) are not taken into consideration.

See also

Object support during migration

3.5 Engineering System

3.5.1 Screens and Screen Objects

Contents

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

Screen objects after HMI device replacement

If you upgrade a device to the new HMI device versions, you should check the screens contained in the project. Because of the new appearance and improved operability, texts of symbolic I/O fields may not be completely legible and may be concealed by operator controls.

Copying display objects between two projects or two devices

In Project_1 configure an alarm window in the Global Screen, for example. You copy the alarm window and paste it in the Global Screen in Project_2.

The enabled alarm classes are partly not enabled in the alarm window after pasting.

This behavior applies to the following display objects:

- Alarm window
- Alarm indicator
- Alarm view

Display of the cross-references in the Inspector window

The Inspector window displays objects used by a screen object in the "About > Cross-reference" tab.

A screen is open and an object selected. You are using an HMI tag at the object as process tag.

The object and the linked HMI tag are displayed in the cross-references. All locations of use of the object and the HMI tags are listed.

If the HMI tag is interconnected with a PLC tag or a DB tag, the locations of use of the interconnected PLC tag or DB tag are displayed.

Event names in case of alarms in the "Info" tab of the Inspector window

In some alarms of the Inspector window the event names in the "Info" tab will deviate from the names in the "Properties" tab.

Name in the "Properties" tab of the Inspector window	Name in the "Info" tab of the Inspector window
Cleared	ClearScreen
Loaded	GenerateScreen
Enable	Activate
Change	Change
When a dialog is opened	ONMODALBEGIN
When a dialog is closed	ONMODALEND
User change	PASSWORD
Screen change	SCREEN
Disable	Deactivate
Press	Press
Outgoing	Going
Incoming	Coming
Limit "high limit error" violated	AboveUpperLimit
Limit "low limit error" violated	BelowLowerLimit
Click	Click
Loop-in alarm	LoopInAlarm
Release	Release
Alarm buffer overflow	OVERFLOW
Acknowledge	Acknowledgement
Runtime stop	Shutdown
Press key	KeyDown
Release key	KeyUp
Toggle ON	SwitchOn
Toggle OFF	SwitchOff
Value change	Change value

Faceplates

Faceplates cannot be rotated or mirrored.

Tab sequence in screens with faceplates

If you have configured a tab sequence in screens with faceplates in WinCC V12 or WinCC V12 SP1, you should check the tab sequence of these screens in WinCC V13. The tab sequence may have been changed in both the screen and the faceplate.

Tag prefix of a screen window in WinCC Runtime Professional

The objects of the "Controls" palette do not support the tag prefix that can be configured for a screen window.

I/O field with "decimal" display format and format pattern without "s" prefix

You have linked a process tag to an I/O field. The I/O field is assigned the "decimal" display format.

You may select a signed or an unsigned display format.

A "Format pattern" setting without "s", e.g., "999" has the following effects:

1. You cannot set negative values using the I/O field in Runtime.
2. If the tag assumes a negative value, the I/O field generates a two's complement and a corrupted positive value is output.

Trend view on Basic Panels

The trend view buttons are not displayed on Basic Panels. You can operate the trend view using the function keys of the HMI device that are assigned corresponding system functions.

Grouping of screen objects

When you group screen objects in WinCC, performance problems can arise in WinCC in the case of large nesting depths.

ActiveX and .NET controls

ActiveX and .NET controls are always positioned in the foreground in runtime.

The configuration of ActiveX and .NET controls on levels is not supported.

Use of bitmaps as icons

In Windows 8 and Windows 8.1, the use of bitmaps with a size of 48x48 pixels and a color depth of 32 bits as icons is not supported.

Border line of rectangles

In a WinCC V7 project, you have configured a rectangle with the settings "Line weight = 1" and "Draw insider border = yes".

You then migrate the WinCC V7 project to WinCC V12. To have the rectangle displayed correctly, follow these steps.

1. Open the Inspector window of the rectangle.
2. Open the property list.
3. Disable "Widen border line inwards".

Border line of "Graphic I/O field" object

In WinCC V13, the dynamization of the border line of the "Graphic I/O field" object in "Two states" mode has no effect during runtime.

Dynamization of instances of a faceplate type in a group

You are using the instance of a faceplate type in an object group. The properties of the instance are also displayed as properties of the group. Any dynamization with tags, scripts or animations of the group is not displayed in Runtime.

Preview in screen window

You use your own designs with shadows for screen objects. The screen objects can be displayed in a screen window.

The shadows of the screen objects are not displayed in the preview of the screen window. The response occurs only in the engineering system. It is displayed correctly in Runtime.

Assigning graphics to a softkey

A graphic can only be assigned to a softkey if the bottom edge of the permanent window does not conceal the area of the softkey graphic.

Renaming a PLC in Runtime

If a PLC is connected to the PLC code viewer in WinCC Professional and Runtime is running, changing the name of the PLC during runtime will trigger a error. Do not change the PLC name, the IP address, or other properties of the HMI connection during runtime.

Panels and RT Advanced with device version V13: many visually different screen objects

The use of screen objects with very many visually different properties (e.g., very many different styles) can reduce the performance of the user interface in Runtime and can increase the amount of available memory space used. Avoid using, for example, very many different corner radii: 0 pixel, 1 pixel, 2 pixels, 3 pixels, etc.

The use of many differently sized "Gauge" objects can have the same effect. Avoid "Gauge" of height 48 pixels, 49 pixels, 51 pixels, etc. Instead, use sizes such as: 50 pixels, 70 pixels, 100 pixels.

Dynamization of grouped objects

For groupings with multiple nestings (group in group, faceplate in group, group in faceplate, etc.), only the events of the outermost group and the innermost objects can be used for dynamization with system functions. System functions that are configured at events of the lower-level group or lower-level faceplate are not executed.

Number of characters in text fields, lists and alarm texts

The number of available characters in the text of a screen object is dynamic and depends on the HMI device and the memory format. Control instructions and formatting are taken into consideration when entering text data and the maximum number of characters is reduced accordingly.

Transparency in WinCC V13

Transparent graphics can be displayed without any problems in Runtime. This is true for all Comfort Panels and WinCC Runtime Advanced with version 13.0.0.0.

To use the transparency in a graphic view or in a graphic I/O field, the "Fill pattern" property must be set to "Transparent" and the property "Use transparent color" must be disabled.

If the property "Use transparent color" is enabled in a device with version 13.0.0.0, the transparency of the graphic is lost and the transparent pixels are displayed in black. We recommend that you check the "Use transparent color" property at the points of use of transparent graphics after upgrading existing projects to device version 13.0.0.0. If the graphics are not displayed correctly, disable this property.

Addressing tags in the "PLC code display" object

The "PLC code display" object only supports symbolic addressing of tags. If the operand is not addressed symbolically, the network with the operands cannot be displayed and an error message is generated.

Characters that can be used in the property name of the screen blocks with RT Professional

Note the following rules when entering property names of the faceplates:

- The name must start with a letter.
- The name can contain alphanumeric characters and the underscore.
- The name may not contain more than 255 characters.
- Do not use any UNICODE characters (for example, Chinese characters).

Playing videos on Comfort Panels

You can play video sequences on Comfort Panels in the "Media Player" screen object. You can find more detailed information on playing videos on the Internet under:

<http://support.automation.siemens.com> (<http://support.automation.siemens.com/WW/view/en/62101921>) (entry ID 62101921)

Selecting the transfer protocol for the camera view

To display the screens of a network camera in the camera view, define the transfer protocol in the properties of the screen object. Select the TCP or UDP transfer protocol depending on your network and the type of network camera you are using. In most cases, a TCP connection has reliable synchronization with the camera view.

Displaying SIMOTION PLC websites in the HTML browser

If the SIMOTION PLC websites are not displayed correctly in the HTML browser, insert `"/basic"` after the website URL to display the websites in basic mode.

Using the optional "CamControls" from older TIA Portal versions

If you want to continue using the control "CamControl" from older versions of TIA Portal configurations in TIA Portal V13 SP1 or newer, we highly recommend an update of the TIA Portal project version and HMI device version to V13 SP1.

Basic Panels: Animation of object groups

Basic Panels as of device version V13 SP1 support animation of object groups that consist of individual screen objects. Animation of nested groups is not supported, however.

RT Professional: Copying screen objects with linked user data types

After copying a screen object from a screen that uses a user data type to a screen that does not use a user data type, the tag references in the target screen are shown with the prefix `"@NOP::"`. These tag references do not function during runtime if the target screen is to be shown in a screen window. If you want the tag references to function, interconnect the target screen temporarily to a user data type. The interconnection of the target screen to the user data type can then be deleted afterwards.

RT Professional: User data types linked to screen objects in faceplates

If a faceplate uses an element of a user data type and a faceplate is created from this screen object, all tag references in the faceplate are shown as `"@NOP::"`. The tag references function during runtime despite this, however. For the tag references to be shown correctly, no element of a user data type should be used when creating a faceplate from an existing screen object.

Display differences between the configuration and the display on the HMI device

The display of the text configured in a screen object may be different on the HMI device due to the display configuration. If you are using the options for automatic size adjustment in the configuration, check the display on your HMI device in every language.

If texts that were configured with the "Fit object to contents" option cannot be displayed in full, they are reduced slightly on the HMI device. If this reduction leads to a distorted display of texts, disable the "Fit object to contents" option and expand the text with additional blanks. Optionally, you can increase the width of the object or use a shorter formulation for the text.

RT Professional: S7-GRAPH overview

If the name of the S7-GRAPH data block that is interconnected at an S7-GRAPH overview contains a period, the control does not work during runtime.

Migration and configuration of ActiveX controls

Changes to properties of ActiveX controls are only saved if the control synchronizes the OCXState property correctly in the case of changes.

For controls such as "Microsoft Date and Time Picker Control" that do not synchronize the OCXState property correctly, the changes are discarded after the screen is closed, during compilation or after the migration.

Exporting and importing function keys

Function keys are synchronized during the import. If a function key is created in the global screen and the key is empty in the screen, the corresponding function key will use the global definition in all screens.

If you want to disable the global use of function keys after the import, define empty keys in the screens and import the screen types in the following order: Global screen, templates, screens.

If you want to ensure when exporting the screens that the global definition of a function key is not used by the template or by the global screen, create an empty function key in the screen. Select the required function key in the screen, then enable the "Use global assignment" property and disable it again.

3.5.2 Tags and connections

Contents

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

Display of deleted array elements at location of use of HMI tags

The locations of use of HMI tags, such as the process value of IO fields, are usually indicated by the tag name. If the element of an array tag is used, then the tag name will be extended by the index of the array element indicated in brackets.

If a used tag is no longer included in the project, then the tag name will still be displayed at the location of use. The field will be displayed with a red background to indicate the missing tag. If a used array element or the array tag is no longer present, then only the index of the array element will be displayed in brackets. The tag name will not be displayed. The field is highlighted in red. You can no longer identify the name of the associated array tag based on the location of use in this instance.

If you do not know which array tag was linked to this location of use, then it may be necessary to link the array element once again.

If a tag or array tag was created based on a reference, then the selected reference will be closed automatically.

If an HMI tag is connected with an array element of a PLC tag and the PLC tag does no longer exist in the project, then the same behavior will take place in the "HMI tags" editor.

Array tags as list entry of multiplex tags

You can use the array tags of the Char data type just like the tags of the String data type.

The use of an array tag of the Char data type as list entry of a multiplex tag in the "HMI tags" editor is not supported.

Multiplexing tags on a Basic Panel

If you multiplex a tag with an external tag on a Basic Panel, the address is read from the PLC in runtime during the first read cycle. The value of the address read is not available until the second read cycle.

Runtime Advanced and Panels: Importing array elements and structure elements

Array tags and structure tags are always imported in full with all elements. The elements of the array tags and structure tags are not filled further during import.

A new tag is created if the name of a tag corresponds to the name of an array or structure element in the import file.

Example:

The import file contains an array tag called "Otto" with 10 array elements. The array elements are then called Otto[1], Otto[2], for example.

If the import file contains a tag named "Otto[1]", the first element of the array tag will not be filled. Instead, a new tag will be created in the engineering system.

Local ID of HMI connections

You cannot edit the "Local ID" value in the HMI connection properties. You need the local ID, for example, for communication by way of AR_SEND. To enable usage of the "Local ID" for communication, proceed as follows:

1. Open the network view in the "Devices & Networks" editor.
2. Click "Connections".
3. Select an S7 connection.
4. Select the "Add new connection" command in the shortcut menu of the PLC.
5. Click on the interface.
6. Specify the "Local ID (hex)".
7. Click "Add" and then "Close".
8. Select "Properties > General" from the partner area of the Inspector window and enter the IP address of the HMI device for the new connection.
9. Configure the necessary raw data tags for communication in the HMI device.

Tags with the DTL data type

Tags that use the "DTL" data type element by element, can only be used as read-only.

Tag names in faceplates

Use of the "." or "@" character in names of tags in faceplate types is not permitted. Do not use these special characters in the tag names in faceplates.

RT Professional: Tags with symbolic addressing and "Char Array" data type

Tags with symbolic addressing and the "Char Array" data type are not released for communication of RT Professional and SIMATIC S7-1200 V3.

Array elements in WinCC

If you have connected an HMI tag with an array from a STEP 7 data block which does not start with a low limit of 0, the array elements are mapped in WinCC to the low limit of 0.

To ensure that you do not have to rethink between the STEP 7 indices and the WinCC indices when accessing the individual array elements, the low limits of arrays should also start at 0 in STEP 7.

Duration of the initialization of historical data

Initialization of the archives on some storage media can take up to 5 minutes. The successful completion of initialization is confirmed by a system message once it has been completed. If there a lack of any storage medium for archiving when Runtime starts, the appearance of the system message can also take up to 5 minutes.

3.5.3 Alarm system and alarm displays

Contents

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

Displaying special characters in alarm texts

When configuring alarm texts, a fixed character set is used in the Engineering System. This character set allows you to use numerous special characters in alarm texts.

Language-dependent fonts are used in runtime to display the texts, for example MS P Gothic, SimSun. The fonts used in runtime do not support all special characters. As a result, some special characters are not displayed in runtime.

Use of multiplex tags in output boxes with alarm texts

It is also possible to use multiplex tags in the output boxes of alarm texts in the engineering system. During runtime, this leads to an incorrect display of the alarm, because the use of multiplex tags is not supported by the basic panels.

Parameters in user alarms

Contrary to the information in the online help, it is not possible to configure parameters for user alarms.

The menu command "Properties > Properties > Alarm parameters" is not available in the Inspector window.

Tags in alarm texts of Runtime Advanced

Tags of data type WChar or WString cannot be displayed in the alarm view in Runtime Advanced.

Boolean tags in alarm logs

Bool type tags are recognized as 0 and -1 in the alarm log. If you use a text list that is controlled by a tag of the type Bool in an alarm log, then add the entry for the value -1 to the corresponding text list.

Duration of the initialization of historical data

Initialization of the archives on some storage media can take up to 5 minutes. The successful completion of initialization is confirmed by a system message once it has been completed. If there is a lack of any storage medium for archiving when Runtime starts, the appearance of the system message can also take up to 5 minutes.

Printing alarms in Runtime

In WinCC, only ASCII characters are supported when printing alarms directly in Runtime.

3.5.4 System functions

Content

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

The "SimulateTag" system function on Basic Panels

If you use the system function "SimulateTag" with a short cycle time on a Basic Panel, the HMI device may be overloaded.

3.5.5 Recipes

Contents

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

Arrays in recipe elements

If you have configured both an array as well as the elements of this array for recipe elements of a recipe, the loading of data records aborts with the following error message: "290055: Import of data records aborted with error"

Use either the array or just the array elements for recipe elements of a single recipe.

3.5.6 User administration

Contents

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

Encrypted connection with SIMATIC Logon V1.5 SP3

Secure encrypted communication between SIMATIC Logon and HMI operator devices is supported as of SIMATIC Logon version V1.5 SP3 and the HMI device version V13 SP1 for Comfort Panels, KTP Mobile Panels and RT Advanced.

HMI devices with a version V13 or earlier can only make a non-secure / non-encrypted connection to a SIMATIC Logon server.

Authentication and certificate management in SIMATIC Logon

If you want to use a secure encrypted connection, the first time a connection is made the SIMATIC Logon certificate is compared with the local certificate of the HMI device. Only when the comparison has been successfully performed can a secure encrypted connection be successfully established.

When you make a connection the first time, the compared certificate is stored under "SimaticLogon\rejected". If you trust the certificate of the server, copy the stored certificate into the local certificate store directory.

The certificate store is located in the following path:

- On the PC under "C:\Program Files\Siemens\CoRtHmiRtm\SimaticLogon\certs"
- On HMI panels under "\flash\simatic\SimaticLogon\certs"

Dynamic logon

In Runtime Professional, an automatic log-off time does not affect users that log on via a logon tag.

3.5.7 Communication

Contents

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

Connection interruptions with Mitsubishi PLCs

After multiple connection interruptions, a situation may arise where all the connection resources of the Mitsubishi PLC are in use and the connection can no longer be established. It is recommended to check these connection resources in the PLC program of the PLC and also to enable them again.

Limited number of possible HMI connections

An error message is displayed during compilation of a device indicating that the configuration of the HMI connection in the "Devices & Networks" editor is invalid. The reason may be that the maximum number of possible connections of the HMI device or PLC has been exceeded.

Check the maximum number of available connections. Consult the device manuals of the devices you are using.

Communication by means of routing with S7 300/400

Communication of connection partners in different subnets is possible via routing with the following connections: PROFINET, PROFIBUS, MPI.

Use of PROFINET IO with panel HMI devices

When using PROFINET IO to connect the direct keys and LEDs of HMI devices to the PLC, you can define an offset for the address area of the inputs and outputs during configuration in HW Config.

The following restriction applies when a PROFINET IO-capable S7-400 CPU is used with one of the HMI devices listed below:

The offset for the start of the address area of the inputs must not be greater than the offset for the start of the address area of the outputs.

The restriction applies to the following HMI devices:

- OP 177B
- OP 277
- Mobile Panel 177

For the configuration of the address parameters, open the PLC with the S7-400 CPU in HW Config. Select the HMI device connected via PROFINET IO in the station window of HW Config. A table with the properties of the HMI device is displayed at the bottom of the station window in the detail view. Select the line containing the addresses of the HMI device in the table and open the object properties using the shortcut menu.

Enable the "Addresses" tab in the "Object properties" dialog. Configure the offset for the inputs under "Inputs > Start". Configure the offset for the outputs under "Outputs > Start".

Exceeding value ranges with Mitsubishi MC and Mitsubishi FX

With some data types, the Mitsubishi MC and Mitsubishi FX communication drivers do not check whether the value of a recipe tag exceeds the value range of the PLC tags. The data types affected are:

- 4-bit block
- 12-bit block
- 20-bit block
- 24-bit block
- 28-bit block

Coordination area pointer in an OPC connection

In principle, the coordination area pointer can be used eight times in an OPC connection. If you have configured an OPC connection and you automatically create another OPC connection using "Add", the coordination area pointer is only displayed once in the newly created connection. In this case, you should change the communication driver of the connection. If you then set OPC again as the communication driver, the coordination area pointer can again be used eight times.

Changing IP settings and device name of a PLC in the Control Panel of the HMI device

The Control Panel is open in the "Service and Commissioning > IP-Adaptation" menu on the HMI device. If you want to change the IP settings or the device name of a PLC, note the following:

In the Engineering System, you need to have activated the following options in the Inspector window of the PLC under "Properties > General > PROFINET interface > Ethernet addresses" beforehand:

- "Set IP address using a different method" and
- "Set PROFINET device name using a different method".

HMI connections in WinCC V13

HMI connections to SIMATIC S7-1200 PLCs with firmware versions earlier than V2.0 are not possible in WinCC V13.

Connections via PROFIBUS DP

When a connection between a PLC and an HMI device via PROFIBUS DP is interrupted and then re-established, sporadically all other PROFIBUS DP connections in the communication network are interrupted and re-established.

De-energize the disconnected station before reconnecting it.

"Set the IP suite (address) of the PLC in the Control Panel" with SIMATIC S7-1200 V1

The function "Set the IP suite (address) of the PLC in the Control Panel" has not been approved for the following PLCs:

- SIMATIC S7-1200 V1

Switching a connection

A connection may be interrupted when it is switched from an HMI device to a SIMATIC S7-300/400, to a SIMATIC S7-1500 or to a SIMATIC S7-1200 PLC.

Note the following settings in the SIMATIC S7-1500 or SIMATIC S7-1200 controllers:

- Absolute addressing of tags
- The "Disable PUT-GET communication" option must be selected
- The "Complete protection" protection level may not be set

Raw data communication in redundant projects

Simatic.NET, Named Connections and various communication blocks, such as BSEND/BRCV, for example, can only be used to a limited extent in a redundantly configured PC station because the connection parameters for the redundant partner server cannot be configured.

Non-integrated connection to a SIMATIC S7-1500 software controller

A non-integrated connection between an HMI device and a SIMATIC S7-1500 software controller is not supported in WinCC.

3.6 System-wide functions

Contents

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

Using system diagnostics in the device proxy

To use the system diagnostics function in an IPE device proxy, for example, a system diagnostics view, insert the PLC alarms as content of a device proxy.

Importing and exporting project texts

In WinCC, you only import the previously exported project texts into the same project. Importing into a different project is not supported.

Initialize device proxy with data from a V13 project

You cannot initialize a device proxy with data from a V13 project in a project with the version V13 SP1.

Upgrade the V13 source project to version V13 SP1 to initialize the device proxy in the target project with the data from the source project.

3.7 Compiling and loading

Contents

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

Compiling and loading

If internal errors or warnings occur during compiling, compile the complete project using the command "Compile > Software (rebuild all)" in the shortcut menu of the HMI device.

Before you start productive operation with your project, compile the entire project using the "Compile > Software (rebuild all)" command from the shortcut menu of the HMI device.

If you are using HMI tags that are connected to the control tags in your project, compile all modified blocks with the command "Compile > Software" in the shortcut menu before you compile the HMI device.

Settings for update of operating system

If you select the command "Online > HMI device maintenance > Update operating system" from WinCC, you cannot change the settings such as the type of PG/PC interface or baud rate. The settings used during the last download are always used.

To make changes to the settings, open the "Extended download to device" dialog using the "Online > Extended download to device" command and change the settings. When you click the "Load" button the changed settings are saved.

Alternatively, you can perform an update of the operating system with changed settings with ProSave. You start ProSave via the Windows Start menu "Siemens Automation > Options and Tools > HMI Tools > SIMATIC ProSave".

Incorrect installation of ProSave

If you receive an error message during installation of ProSave when loading data to a target device or maintenance of an HMI device, then you cannot remedy this error using the repair function of setup. Remove ProSave via the Control Panel. Then start setup and install the "ProSave" component again.

Checking the address parameters

During compilation of an HMI device in the project tree with the command "Compile > Software" in the shortcut menu, the address parameters of the HMI device, such as the IP address, will not be checked. If you want to ensure that the address parameters are checked as well, you will have to compile the HMI device using the "Compile" button in the "Devices & Networks" editor of the toolbar.

Error message when downloading data to the PLC

A panel and a PLC are connected and communicating with other.

If a tag is accessed while downloading data from the panel to the PLC, an error message is displayed on the panel.

Delayed reaction in the "Extended download to device" dialog

If the settings in the "Extended download to device" dialog for "Type of the PG/PC interface" and "PG/PC interface" do not match the settings on the HMI device, this can result in the application not responding for up to a minute.

Extended download with an S7-1200 and a Comfort Panel

An S7-1200 PLC and a Comfort Panel are located in the same physical network as the PG/PC. You open the "Extended download to device" dialog for the Comfort Panel.

If you enable the option "Show all accessible devices", it may occur that the application stops responding.

OP77A, OP73, TP177A: Loading projects

When loading a project to an HMI device, it can happen that Runtime is not automatically ended, even though "Remote Transfers" is activated in the Panel.

If this happens, stop Runtime and manually set the transfer mode on the HMI device.

Loading a SIMATIC HMI application to a PC station

The following circumstances can lead to an error message during the first load of a SIMATIC PC station:

- A SIMATIC HMI application is configured in a PC station in the project
 - WinCC Runtime Advanced
 - WinCC Runtime Professional
 - WinCC Standby
 - or WinCC Client
- The property "S7RTM is installed" is activated.

Before you load a SIMATIC PC station for the first time, select the configured device HMI_RT (WinCC...) in the project tree. Open the "Extended download to device" dialog and select the appropriate interface and parameter settings. Click "Load".

You then load the PC station as normal.

Project transfer via USB

If you have connected more than one HMI device via USB to your configuration PC, project transfer is only possible to the last connected device.

Opening project files

When you run "HmiIrtm.exe", a dialog opens asking if you want to open the project file (.fwc).

The following options are available to you:

- "Yes": A dialog opens allowing you to select a project file (.fwc).
- "No": The dialog closes.

Tag simulator in WinCC Professional does not start

If the tag simulator does not start in WinCC Professional, it may be because the fm20.dll file has not been installed in the system yet. The fm20.dll file cannot be distributed and must be installed as part of a Microsoft application:

<http://support.microsoft.com> (<http://support.microsoft.com/default.aspx?scid=kb;EN-US;224305>)

You have the following two options for installing the fm20.dll file:

- Install an application, such as Microsoft Office 97, on the destination system. The installation routine also installs the fm20.dll file.
- You can also download and install the Microsoft ActiveX Control Pad free of charge. The fm20.dll file is also installed in this case. Additional information on the ActiveX Control Pad is available on the Microsoft Developer Network website:
<http://msdn.microsoft.com/en-us/library/ms968493.aspx> (<http://support.microsoft.com/default.aspx?scid=kb;EN-US;224305>)

Error message when PLC is loaded with a newer version of the TIA Portal

PLC code display shows the current program status of PLC programs.

An error message is output if the PLC code display from an older version of WinCC accesses a program on the PLC loaded with a new version. Make sure that the PLC and the HMI are loaded with the same version of the TIA Portal.

Comfort panels as of device version 13.0: Backing up data while loading projects

If the transfer is interrupted for Comfort Panels with a device version 13.0 or higher, WinCC automatically ensures that no data is lost and that existing data is only deleted on the HMI device after complete transmission.

Loading projects to a file

The "Load project to file" functionality is only available in Runtime Advanced devices with version V13 or older.

Displaying characters in transfer alarms

If characters are not displayed correctly in the transfer alarms during transfers to HMI devices with the device version V12 or older, please check the region and language settings in Windows. Set the corresponding language under "Language for non-Unicode programs".

3.8 Runtime

3.8.1 Notes on operation in Runtime

Contents

Information that could no longer 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 in a V12 project, the focus may no longer be identifiable after changing the HMI device version in Runtime. Change one of the two colors.

Language behavior - Layout of on-screen keyboard

The layout of the on-screen keyboard is not switched when the runtime language changes.

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.

Complete download in Service mode

If you need to perform a "complete download" to the OS in Service mode from the engineering station, Runtime automatically stops and then starts again.

The project is then no longer in Service mode.

In this state, the power supply is interrupted and WinCC Runtime no longer starts automatically on the OS.

Remedy:

1. Switch the project manually to Service mode after you have performed the "complete download".
2. Close the project manually.
3. Enable Service mode.
4. Start Runtime again using the surrogate icon in the taskbar.

Slow reaction of SmartServer

The following programs may start and respond very slowly under Windows 7 and Windows 2008 servers:

- 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\
-

Starting Runtime

Only WinCC Runtime V13 can be started in TIA Portal V13. WinCC Runtime V11.02, V12 or V13 can be simulated in TIA Portal V13.

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).

Blocking task switching on Windows 7 and Windows 8.x

To use the "Block task switching" option on a Runtime PC, disable the Aero theme in Windows 7 and Windows 8.x. To disable the Aero theme, right-click on the Desktop and select "Personalize". In the "Personalization" menu, select the designs "Windows Basic" or "Windows - Classic".

3.8.2 Notes on operation of panels in Runtime

Contents

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

License transfer via S7USB

You always need to run WinCC to transfer a license to a panel via S7USB.

Transferring licenses to a panel on 64-bit operating systems

If you are running a 64-bit operating system and the "Edit > Connect target systems > Connect HMI device" menu command is not available in Automation License Manager, open command line input and run the following command with administrator rights:

```
"%WINDIR%\system32\RegSvr32.exe" "%CommonProgramFiles%\siemens\AlmPanelPlugin\ALMPanelParam.dll"
```

Using the mouse wheel in Runtime

The use of the mouse wheel in Runtime is not supported on all panels.

Basic Panels, OP73, OP77A and TP177A: Displaying texts in runtime

The default font selected in the "Runtime settings > Languages & font" editor has an effect on the display of texts in runtime.

Text entries may be truncated if you selected an unfavorable font size or style.

This setting possibly has an effect on the following text entries:

- Tooltips
- long alarm text
- text in the dialogs

Basic Panels: Connections to S7-1200 and S7-1500 with Backup/Restore

If you use the "Backup/Restore" function, a maximum of two connections from Basic Panels to the controllers are possible at any given time.

- SIMATIC S7-1200
- SIMATIC S7-1500

Basic Panels: Backup on the memory card of the PLC

Create the backup file "A.psb" on the memory card of the PLC. An error, for example a connection break, occurs when creating the backup.

This will create a corrupt file on the memory card of the PLC. Such a file has "~\$" as prefix. Delete the file with the prefix "~\$" if you want to save a backup again under the same name "A.psb".

Basic Panels: Panel Data Storage and S7-1500F

The "Panel Data Storage" PDS function cannot be used on Basic Panels in conjunction with S7-1500F when the password for the protection level "Full access incl. fail-safe" is used.

"Panel Data Storage" function on Basic Panels

The "Panel Data Storage" (PDS) function provided by Basic Panels is only supported by SIMATIC S7-1200 as of firmware V4.0 and SIMATIC S7-1500. For the PDS function, the panel must be connected directly with the CPU and must not be connected via the CP.

3.9 HMI devices

3.9.1 Notes on HMI devices

Contents

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

If the PC goes into standby or hibernate mode while the transfer is in progress, the panel status after interruption of the transfer is not defined.

Multi-key operation

Unintentional actions can be triggered by multi-key operation:

- When you are using a key device, you cannot press more than two function keys at the same time.
- When you are using a touch device, a standard PC or a panel PC, you can only press one function key or button at the same time.

TS Adapter with Ethernet interface

If an HMI device is connected via Ethernet and a TS adapter, it can not be reset to factory settings.

Simulation of the Basic Panels

Use an output field in an alarm text to output an external tag. The content of the output field will always be displayed with "0" during simulation.

Simulation with real PLC connection

The access point used by the simulation is independent from the settings of the engineering system and can only be altered in the Control Panel with the "Setting PG/PC Interface" tool. If the PLC connection is terminated right after the start of the simulation with alarm 140001, you should check the access point used by the simulation with "Setting PG/PC Interface".

1. Double-click "Setting PG/PC Interface" in the Control Panel. A dialog opens.
2. Select "S7ONLINE" in the "Access point of application" field as standard for HMI.

3. Select the interface in the "Interface Parameter Assignment Used" area.
4. Exit the dialog "Setting PG/PC Interface" with OK

Loading of projects without recipe data records

You are using recipes in a project. You transfer the project to a Basic Panel without recipe data records.

You may encounter inconsistencies if you have altered the structure of the recipe in the engineering system and the device already held recipe data records.

Check the consistency of the data records in this case. The device will not issue a note for all structural changes.

Floating point numbers on MP 277, MP 377, TP 177B 4" and CP4

Only floating point numbers in the range from 10^{-293} ... 10^{+307} are displayed correctly on the HMI devices MP 277, MP 377, TP 177B 4" and CP4. If the tag value is outside this range, it is displayed as 0.

Mobile Panels V2

If you use Mobile Panels V2 in a project, it is not possible to open the project with WinCC V11 SP1. This affects projects with the following devices:

- Mobile Panel 277F IWLAN (RFID Tag)
- Mobile Panel 277F IWLAN V2
- Mobile Panel 277 IWLAN V2

"Zone ID/Connection point ID" tag of a Mobile Panel 277 IWLAN V2

The tag used for the "Zone ID/Connection point ID" must be of data type INT for Mobile Panel 277 IWLAN V2 devices. Adapt this data type if necessary when migrating a project.

HMI devices with operating system Windows CE 5.0 or higher

Owing to a modified client-server communication security setting, the time difference between the HMI device (client) and PC (server) must not exceed 1 day. If you back up recipe data from the HMI device on a network drive, for example, make sure that the time is set correctly on the PC (server) and the HMI device (client).

HMI devices with high communication load

S7 Diagnostics should be enabled if a Panel is assigned many connections to PLCs or other HMI devices. Otherwise, you will risk overload on the Panel.

Device replacement in the engineering system

In the engineering system, you replace a device with configured LED keys with a device without LED keys. Runtime start fails after you have transferred the project data to the device.

For this reason, delete the LED key configuration before you replace the device.

Restrictions for the HMI device, MP 377 15" Touch daylight readable

The following functions are not supported in WinCC V12 for the MP 377 15" Touch daylight readable HMI device:

- Option: Sm@rtServer
- System function: SetAndGetBrightness
- Direct keys

Upgrading Basic Panels to WinCC V13

Before you upgrade Basic Panels from version V12 to version V13, transfer the image of the V12 SP2 Update 5 or higher to the devices.

In the "SIMATIC ProSave [OS Update]" dialog, select the setting "Reset to factory settings".

In this way, you always start a functional update of the image.

Affected devices:

- KP300 Basic mono PN
- KP400 Basic color PN
- KTP400 Basic color PN

Connection switch in the Control Panel with Basic Panels

If you use the "Override protected connection information" function, the following restriction applies:

You cannot perform a connection switch in the Control Panel of a Basic Panel from a PLC without a protection level to a PLC with a "Complete protection" level.

2nd generation Basic Panels: Choosing a USB port

If you are not using a USB hub, select the USB port USB_X60.1 as storage path.

KTP400F Mobile

KTP400F Mobile is available as Hardware Support Package (HSP) for version V13 SP1.

Mobile Panels 277F IWLAN (RFID Tag): F_DB_STATES

The block F_DB_STATES is no longer delivered with WinCC V13 SP1. The block F_DB_STATES serves only for data exchange. You can configure a block to replicate the

function of the F_DB_STATES, however. Note the description of the F_DB_STATES in the operating instructions of your HMI device or in the information system.

F_FB_KTP_Mobile and F_FB_KTP_RNG

The fail-safe function blocks F_FB_KTP_Mobile and F_FB_KTP_RNG are not contained in the software WinCC V13 SP1. The function blocks will be part of the WinCC V13 SP1 Update for the Mobile Panels 2nd generation.

Mobile Panels 277F IWLAN

Mobile Panels 277F IWLAN are not released for use with CPUs of the type S7-1500F with WinCC V13 SP1.

Mobile Panels 277F IWLAN are not released for use with CPs in connection with CPUs of the type S7-400F with WinCC V13 SP1.

Affected MLFBs: 6AV6645-0EB01-0AX1, 6AV6645-0EC01-0AX1, 6AV6645-0EF01-0AX1, 6AV6645-0GB01-0AX1, 6AV6645-0GC01-0AX1, 6AV6645-0GF01-0AX1.

Index

.

.Net service packs, 5

.Net versions, 5

A

Alarm

Inspector window, 42

Alarm indicator, 41

Alarm text

Output fields, 49

Special characters, 49

Alarm view, 41

Alarm window, 41

Array, 48

ARRAY component, 21

Array element

Location of use of HMI tag, 47

Name, 47

Array tag

Char, 48

Asian, 5

Assigning global data blocks, 22

C

Char

Array tag, 48

Character string, 22

Characters, 5

Comfort Panel

S7-1200, 56

Comparing library elements, 7

Compatibility, 13, 22

Compiling

Address parameters, 56

Conversions, 24

Convert character string, 22

Copying

Alarm indicator, 41

Alarm view, 41

Alarm window, 41

HMI device, 35

CP 1613, 8

CP 1623, 8

CP 343-2, 16

CP 5512, 8

Cross-reference

Inspector window, 41

D

Data type conversion, 21

Deactivate, 24

Decimal places, 6

DEMUX, 23

Device

Copying, 35

Downloading data to the PLC

Error message, 56

E

EC31-RTX, 16

ENO, 24

Error message

Downloading data to the PLC, 56

ET 200S

Positioning module, 15

Ethernet module

Removal/insertion, 13

Event

Inspector window, 42

Extended download to device, 56

External, 20

External sources, 20

F

F-CM AS-i Safety ST, 16

Firmware versions, 9

Force job on SD card, 7

Function value, 23

G

Go online

Multiple TIA Portal instances, 13

H

Hardware

Detection, 17

HMI device replacement, 35

I

I/O field

Decimal format, 43

Format, 43

IE/PB Link, 16

IE/PB Link PN IO, 16

Inspector window

Cross-reference, 41

Event, 42

Installation

ProSave, 56

Smartdrive, 36

Interfaces, 9

IP address, 8

K

K parameter, 23

L

Language behavior

On-screen keyboard, 58

Library, 7

PLC data types generated by the system, 22

Load

Extended download to device, 56

SIMATIC PC station, 57

Loading

from a device, 13, 21

Module comments, 15

to the device, 13

M

Maximum length

Tag, 59

Memory card, 7

Removal/insertion, 13

Memory reserve, 22

Migration, 6

WinCC V7.0 SP3, 39

Migration of IP access protection lists when activating

Security, 18

Migration of projects with Ethernet CPs and

Security, 18

Mitsubishi

Connection interruption, 52

Module

Inserting, 13

Removing, 13

Module comments, 15

Multi-key operation, 62

MUX, 23

N

Name

Array element, 47

Network, 20

Network drive, 6

O

Online, 9

Online connection

Multiple TIA Portal instances, 13

Online operation, 10, 12

OP73

Loading a project, 56

OP77A

Loading a project, 56

Open force job, 7

Operation in runtime

Multi-key operation, 62

Output fields

Multiplex tag, 49

Overview window, 36

P

PLC data type

PLC data types generated by the system in
libraries, 22

PLC data types, 20

Project data

IO-Link master module, 13

Project library, 36

ProSave

Installation, 56

PTO, 21

PWM, 21

R

READ_DBL, 27

Recipe data record
 Transferring the project, 63
Remote desktop, 6
Return, 23
Runtime
 Mouse wheel, 61

S

S_CONV, 22
S7 routing, 16
 via IE/PB Link, 16
S7-1200, 14
S7-1200 modules, 14
SCL, 21
Screen keyboard
 Language behavior, 58
SD card, 7
Security, 20
Security online diagnostics of S7 CPs, 18
SIMATIC PC station
 Load, 57
SIMATIC S7 Embedded Controller, 16
Simulation, 62
 PLC connection, 63
Smartdrive
 Installation, 36
Special characters
 Alarm text, 49
Start value, 21
STRING, 24

T

T_CONFIG, 25
Tag
 Maximum length, 59
TP177A
 Loading a project, 56
Transferring the project
 HMI device, 63
 Recipe data record, 63
TRCV_C, 24
TS adapter, 62

U

UDT, 20
USB card readers, 8

W

Watch table
 Loading data blocks during an active control
 job, 28
 Multiple access to the same CPU, 28
WinCC V7.0 SP3, 39
WRIT_DBL, 27

