SIEMENS

SINUMERIK

SINUMERIK 840D sl
SINUMERIK Integrate Create MyHMI /WinCC V13

Configuration Manual

Valid for

SINUMERIK 840D sl / 840DE sl control

Software	Version
CNC software for 840D sl/840DE sl	4.5, 4.7
TIA Portal V13	

02/2014

Legal information

Warning notice system

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

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

⚠WARNING
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⚠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.

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

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Preface

SINUMERIK documentation

The SINUMERIK documentation is organized in the following categories:

- General documentation
- User documentation
- Manufacturer/service documentation

Additional information

You can find information on the following topics at www.siemens.com/motioncontrol/docu:

- Ordering documentation/overview of documentation
- Additional links to download documents
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For information about the range of training courses, refer under:

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  SITRAIN - Siemens training for products, systems and solutions in automation technology
- www.siemens.com/sinutrain

  SinuTrain - training software for SINUMERIK

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You can find Frequently Asked Questions in the Service&Support pages under Product Support. http://support.automation.siemens.com

SINUMERIK

You can find information on SINUMERIK under the following link:

www.siemens.com/sinumerik

Target group

This publication is aimed at planning and application engineers.

Benefits

The Configuration Manual enables the target group to apply the rules and guidelines to be observed when configuring products and systems. It helps you select products and functions.

The Configuration Manual helps the target group to create a system or plant configuration.

Standard scope

This documentation only describes the functionality of the standard version. Additions or revisions made by the machine tool manufacturer are documented by the machine tool manufacturer.

Other functions not described in this documentation might be executable in the control. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

For the sake of simplicity, this documentation does not contain all detailed information about all types of the product and cannot cover every conceivable case of installation, operation, or maintenance.

Technical Support

You will find telephone numbers for other countries for technical support in the Internet under http://www.siemens.com/automation/service&support

EC Declaration of Conformity

The EC Declaration of Conformity for the EMC Directive can be found on the Internet at:

http://support.automation.siemens.com/WW/view/de/10805517/134200

Contents

Introduction 1

1.1 General information on the contents of this description

Position in the documentation landscape

This documentation describes only those functions which are additionally provided by SINUMERIK Integrate Create MyHMI /WinCC V13.x. This assumes you are familiar with the standard scope of SIMATIC WinCC V13 (TIA Portal), which is described in the information system in the superordinate section "Visualizing processes".

Some of the descriptions for SINUMERIK Integrate Create MyHMI /WinCC V13 only apply to the configuration of a PC system (e.g. PCU 50.5) with WinCC RT Advanced. These descriptions have the designation "(PC system)" in the title.

In addition, you can use the example configuration procedures when configuring a PC system (Page 19) or a SIMATIC Panel (Page 20).

For all other descriptions, refer to the corresponding documentation:

Information system of the TIA Portal

A comprehensive help system is supplied with the TIA Portal for performing your tasks. It describes basic concepts, instructions and functions.

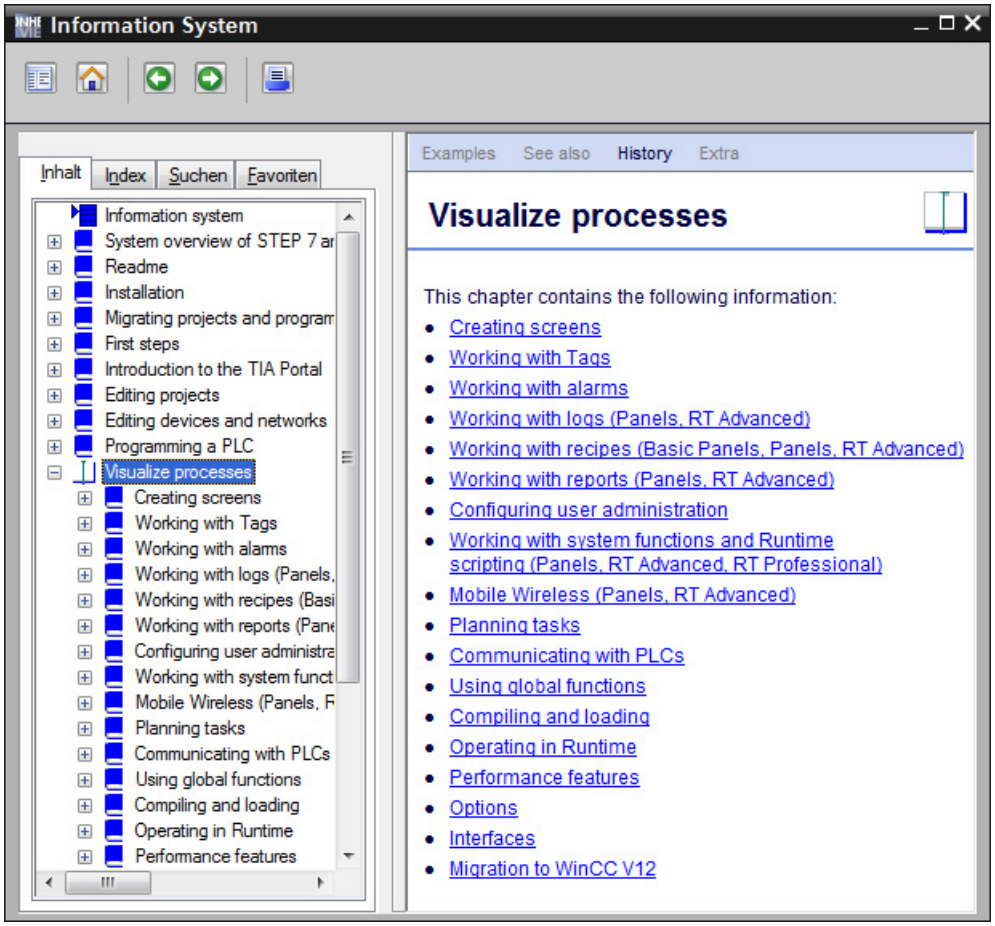


Figure 1-1 Information system of the TIA Portal, "Visualizing processes" section

- To access the information system, click "Show help" in the "Help" menu.
- When a reference is made in this documentation to a section in the information system, you can find the appropriate section at the specified location in the "Contents" tab.
- In this documentation, you can find references to keywords in the information system. To navigate to the related content, open the "Index" tab in the information system, enter the first part of the keyword and double-click on the second part.

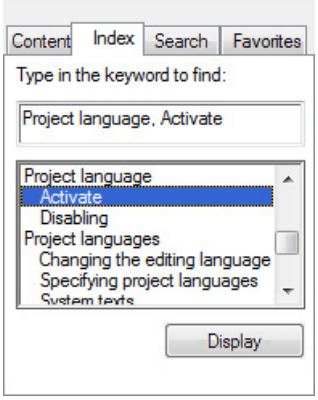


Figure 1-2 Looking up keywords in the information system

Alternatively, you can use the search function.

TIA Portal, SIMATIC WinCC V13: Standard functions

- You can find basic information on the TIA Portal and the user interface in the information system, section "Introduction to the TIA Portal > User interface and operation."
- For more basic information, see the following sections in the information system: "Editing projects", "Configuring devices".
- You can find help on the standard functions of SIMATIC WinCC V13 in the information system of the TIA Portal, section "Visualizing processes".

Configuration of the PCU 50.5

If you customize the user interface of SINUMERIK Operate on a PC system, the documentation for PCU 50.5 can provide assistance:

- Software configuration of the PCU 50.5
  Base Software and Operating Software commissioning manual
- Information on the hardware configuration, setup and networking of the PCU 50.5
  SINUMERIK 840D sl Operating Components and Networking manual

Operation of SINUMERIK Operate

You can find information on the operation of SINUMERIK Operate in the online help and in the Basic Software and HMI Software commissioning manual.

Configuration of SIMATIC Panels

If you supplement SIMATIC Panel with SINUMERIK functionality, the documentation for your specific device can provide assistance. A list with links to the individual hardware documentation titles can be found in the information system of the TIA Portal, section "Hardware Documentation> HMI Manuals".

Documentation for the supplied software and other software

See Overview of TOOLS supplied (Page 15).

Overview of all SINUMERIK documentation

For up-to-date documentation on SINUMERIK, please refer to the Service&Support portal:

SINUMERIK CNC automation system
(http://support.automation.siemens.com/WW/view/en/10805517/133300)

1.2 Functional scope

1.2.1 Product features

This add-on package for SIMATIC WinCC Advanced allows you to use special SINUMERIK HMI functions within WinCC.

Supported HMI devices

- SIMATIC Panel
  - SIMATIC Comfort Panel (e.g. KP400 Comfort)
  - SIMATIC Multi Panel (e.g. MP 177 6" Touch)
  - SIMATIC Mobile Panel (e.g. Mobile Panel 177 6" DP
- PC systems with Windows 7
  - SIMATIC Panel PC
  - SINUMERIK PCU 50.5 Windows 7

Runtime WinCC RT Advanced

The runtime 'WinCC RT Advanced' can be used to integrate full-screen images into the OEMFrame area of SINUMERIK Operate. This runtime is used by both SIMATIC Panels and PC systems.

- Runtime is already integrated for SIMATIC Panels.
- For PC systems, the runtime in the TIA Portal must be configured and installed on your PC system (Page 26). Only Windows 7 is supported as an operating system on the PC system.
  "WinCC RT Advanced V13" Runtime is provided as well on the product DVD.

Scope of functions of Runtime WinCC RT Advanced

The scope of functions of Runtime when using SIMATIC Panels and PC systems is identical:

- Ethernet communication with SINUMERIK 840D sl
- MPI communication with SINUMERIK 840D sl
- Visualization of NC variables
- Visualization of GUD variables
- Visualization of machine and setting data
- NC alarms
- DB2 alarms
- Control for activating part programs
- Triggering specific PI services (for example, NC restart, setting a password)

- Triggering a general PI service (using the "General PI service" function)
- Standard functions of WinCC Compact/Advanced editions
- Symbolic addressing of the PLC portion when using integrated connections
- Example projects

1.2.2 Overview of TOOLS supplied

Overview

The following tools are additionally supplied with SINUMERIK Integrate Create MyHMI / WinCC V13.x:

- **GUD tool "WinCC import NC user data"**
  This tool is used to generate a user database (Userdata.mdb) on the PG/PC from the definition files of the dynamic user data (MGUD.DEF, UGUD.DEF etc.).
  The GUD TOOL "WinCC import NC user data" (GUD_TOOL.exe) is copied to the installation directory when installing SINUMERIK Integrate Create MyHMI /WinCC V13.x.
  Start the GUD tool "WinCC import NC user data" with "Start > Siemens Automation > SINUMERIK > GUD Tool V13".
  See Creating a user database for global user data (Page 75).
- **HMI integration tool "Integration Sinumerik Operate"**
  The HMI integration tool "Integration Sinumerik Operate" provides support for integrating the configuration for WinCC RT Advanced in SINUMERIK Operate on the PCU 50.5.
  Start the HMI integration tool with "Start > Siemens Automation > SINUMERIK > Integration Sinumerik Operate English Tool".
  See Integrating Runtime in SINUMERIK Operate (PC systems) (Page 130).

The following software is also mentioned in this documentation:

Software	Source
WinCC TagConverter	Available on the Service & Support pages on the Internet:Tag converter for WinCC (http://support.automation.siemens.com/WW/view/en/56078300)
SINUMERIK Integrate Access MyMachine /P2P	Can be ordered in SIEMENS Industry Mall (https://ebstage.automation.siemens.com/mall/en/us/Catalog/Products/10166235)

1.3 Communications principle

Overview

A SINUMERIK NCU includes the integrated subcomponents PLC and NCK. WinCC uses different communication drivers to access these subcomponents.

- PLC
  - Behaves like an S7-300 controller in respect to data communication.
  - Uses the communication driver "SIMATIC S7-300/400".
- NCK
  - Requires special tag descriptions and specific services.
  - Uses the communication driver "SINUMERIK NC". The "SINUMERIK NC" communication driver allows you to read/write NC tags and GUDs as well as to access PI services.

Table 1- 1 Assignment of interfaces, HMI devices and communication drivers

HMI device	Runtime	Communication drivers		NCU interface
		PLC	NCK	
PCU 50.5 with SINUMERIK Operate	Pluggable WinCC RT Advanced	SIMATIC S7-300/400	SINUMERIK NC	Ethernet interfaces of the CP (X120, X130)
SIMATIC Panel	Integrated WinCC RT Advanced	SIMATIC S7-300/400	SINUMERIK NC	MPI (X136)
		SIMATIC S7-300/400	SINUMERIK NC	Ethernet interfaces of the CP (X120, X130)

You can use different ports on the NCU depending on the HMI device.

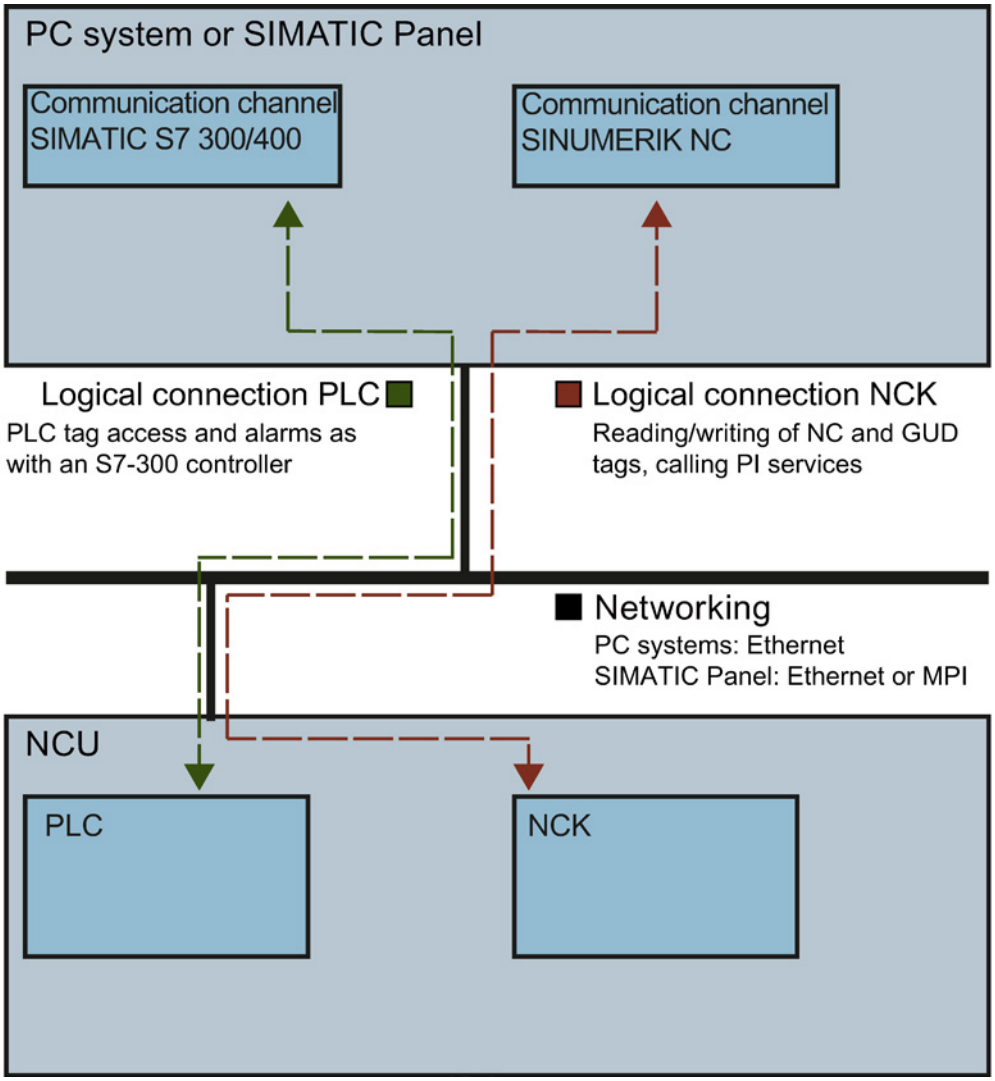


Figure 1-3 Communication principle

1.4 Sample configuration procedure

1.4.1 Overview

An exemplary configuration procedure when using a PC system (Page 19) or SIMATIC Panel (Page 20) can be found in the overview tables.

An example project (Page 21) is provided with the installation, which you can open and view in the TIA Portal.

1.4.2 Configuration procedure when using PC systems

The following table shows an exemplary configuration procedure when using a PC system with WinCC RT Advanced.

For descriptions that relate to the standard scope of SIMATIC WinCC Advanced, refer to the corresponding help in the information system of the TIA Portal (see also: Position in the documentation landscape (Page 9)).

No.	Step	Additional information
1	Install the software on the PCU 50.5	Installing software on the PC system (PCU 50.5) (Page 26)
2	Configure the PG/PC interface	Configuring the PG/PC interface (PC systems) (Page 28)
3	Create a project	Information system, keyword "Project, create"
4	Add a PC system and WinCC RT	Inserting PC system and Runtime (Page 42)
5	Specify screen resolution of the operator panel front	Configuring screen resolution (PC systems) (Page 46)
6	Add screens and master copies, if needed	Information system, section "Visualizing processes > Creating screens > Working with screens"
7	Define start screen	Information system, keyword "Start screen"
8	Configure screen size	Configuration of the screen size (PC systems) (Page 48)
9	Add NCU	Information system, keyword "NCU, add"
10	Create a connection	Overview (Page 53)
11	Configure the language settings	Overview (Page 117)
12	Configure tags	Configuring variables (Page 61)
13	Configure alarms	Overview (Page 79)
14	Configure screen objects	Overview (Page 97)
15	Configure system functions	Overview (Page 103)
16	Compile project	Information system, section "Visualizing processes> Compile and Download"
17	Test configuration as simulation	Information system, keyword "Compile, project"
18	Loading configuration to a PCU 50.5 If you change your configuration after loading it in the TIA Portal, you must compile it again and download it to the PC system.	Overview (Page 125)
19	Integrate "WinCC RT Advanced" Runtime in SINUMERIK Operate You usually need to integrate Runtime in SINUMERIK Operate only once. You only need to repeat the process if you want to change something in the settings for the integration of Runtime in SINUMERIK Operate.	Integrating Runtime in SINUMERIK Operate (PC systems) (Page 130)

1.4.3 Configuration procedure when using SIMATIC Panels

The following table shows an exemplary configuration procedure when using a SIMATIC Panel.

For descriptions that relate to the standard scope of SIMATIC WinCC Advanced, refer to the corresponding help in the information system of the TIA Portal (see also: Position in the documentation landscape (Page 9)).

No.	Step	Additional information
1	Create a project	Information system, keyword "Project, create"
2	Add a SIMATIC Panel	Adding a SIMATIC Panel (Page 49)
3	Add NCU	Information system, keyword "NCU, add"
4	Create a connection	Overview (Page 53)
5	Configure the language settings	Overview (Page 117)
6	Add screens and master copies	Information system, section "Visualizing processes > Creating screens > Working with screens"
7	Define start screen	Information system, keyword "Start screen"
8	Configure tags	Configuring variables (Page 61)
9	Configure alarms	Overview (Page 79)
10	Configure screen objects	Overview (Page 97)
11	Configure system functions	Overview (Page 103)
12	Compile project	Information system, section "Visualizing processes> Compile and Download"
13	Test configuration as simulation	Information system, keyword "Compile, project"
14	Load configuration in SIMATIC Panel	Information system, section "Visualizing processes> Compile and Download"

1.4.4 Example projects

General

The examples are located in the following directory:

- <Installation directory of TIA Portal>\Automation\Portal V13\Data\HMI\Sinumerik\samples

Example NCSecurity.ap*

"NCSecurity.ap*" shows how the visibility and operability of an I/O field can be controlled using the NC tag "Access Level".

The most important settings are to be found in the properties dialog box of the I/O field in the area "Animation" > "Display".

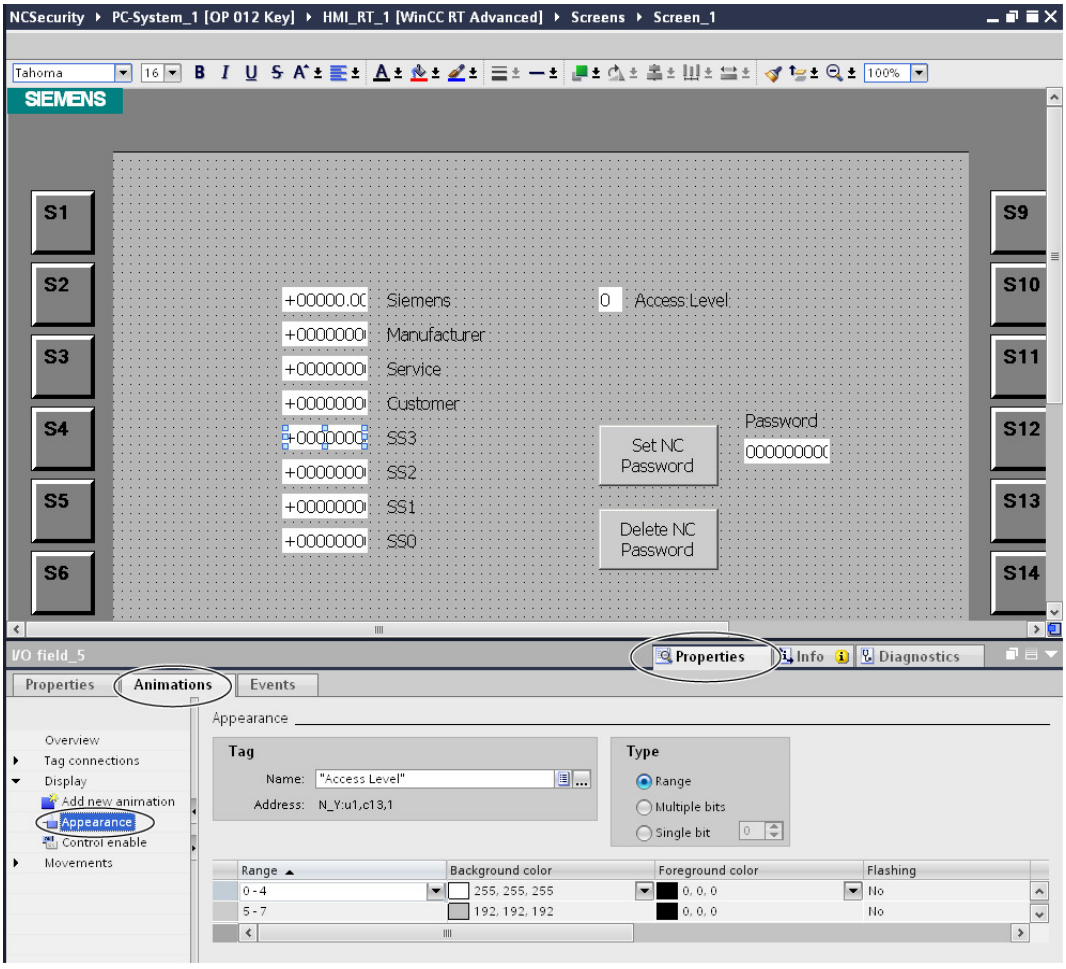


Figure 1-4 Settings in the NCSecurity example project

1.5 Licensing

1.5.1 Licensing when using PC systems with SINUMERIK Operate

You need the following licenses:

- **Engineering system**

  SIMATIC WinCC Advanced V13

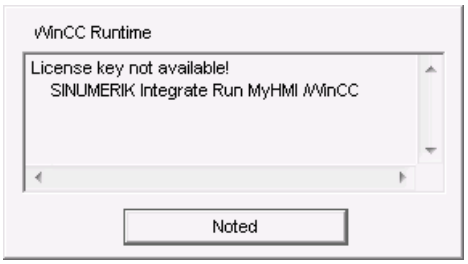
- **Runtime**

  License P61 - SINUMERIK Integrate Run MyHMI /WinCC

  Article No.: 6FC5800-0AP61-0YB0

  Message if there is no license

  In SINUMERIK Operate, if option "SINUMERIK Integrate Run MyHMI /WinCC" is not licensed, then a request for a license is displayed during the runtime.



  The name of the software option to be licensed differs depending on the software version; however, the license to be ordered is identical (Article No.: 6FC5800-0AP61-0YB0):

  – SINUMERIK Operate 4.6 or newer: "SINUMERIK Integrate Run MyHMI /WinCC"

    In SINUMERIK Operate, license option P61 "SINUMERIK Integrate Run MyHMI /WinCC" so that the request is no longer displayed.

  – SINUMERIK Operate 4.5 SP2 or older: "Sinumerik HMI sl Runtime OA Configuring"

    In SINUMERIK Operate, license option P61 "Sinumerik HMI sl Runtime OA Configuring" so that the request is no longer displayed.

1.5.2 Licensing for SIMATIC Panels

You need the following licenses:

- Engineering system

  Basic WinCC license
- Runtime on SIMATIC Panel

  License P03 - SINUMERIK 840D sl SINUMERIK Integrate Run MyHMI /SIMATIC OP

  6FC5800-0AP03-0YB0

Installation 2

2.1 System requirements and installation

SINUMERIK Integrate Create MyHMI /WinCC V13.x represents an add-on package for SIMATIC WinCC Advanced V13 (TIA Portal) with additional setup.

System requirements

All hardware and software requirements for installing SIMATIC WinCC Advanced V13 apply. (See readme file for SIMATIC WinCC Advanced V13)

Requirement

- All other applications (e.g. Microsoft Word and TIA Portal) are closed.
- SIMATIC WinCC Advanced V13 is installed on the PG/PC.

Procedure

To install SINUMERIK Integrate Create MyHMI /WinCC V13.x, follow these steps:

1. In Windows Explorer, browse to the root directory of the product DVD.
2. Double-click the setup file "Start.exe" from SINUMERIK Integrate Create MyHMI /WinCC V13.
3. Install the software using the installation wizard.

Result

SINUMERIK Integrate Create MyHMI /WinCC is installed on the PG/PC.

If you expand SINUMERIK Operate with an operating area on a PC system (PCU 50.5) via the WinCC RT Advanced, you must install Runtime WinCC RT Advanced as well as SINUMERIK Integrate Create MyHMI /WinCC (Page 26) on it.

2.2 Installing software on the PC system (PCU 50.5)

If you expand SINUMERIK Operate with an operating area on a PC system (PCU 50.5) via WinCC RT Advanced, you must also install the following on it in the correct sequence:

- Runtime WinCC RT Advanced included on the product DVD in the "Support" directory
- SINUMERIK Integrate Create MyHMI /WinCC V13

However, you do not need to install SIMATIC WinCC Advanced V13 engineering system (TIA portal) on the PC system.

Procedure

To install SINUMERIK Integrate Create MyHMI /WinCC on the PC system, follow these steps:

1. On the product DVD, open the directory "\Support\WinCC RT Advanced" and double-click on the WinCC RT Advanced setup file "Start.exe"

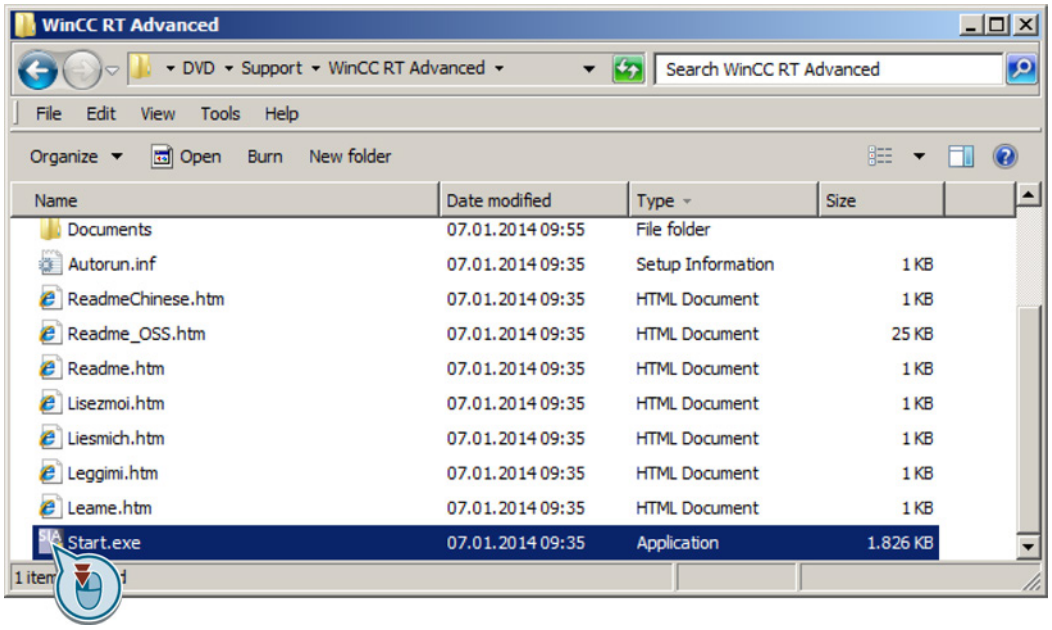


Figure 2-1 Starting WinCC RT Advanced runtime setup

2. Change to the master directory of the product DVD and double-click the setup file "Start.exe" from SINUMERIK Integrate Create MyHMI /WinCC V13.

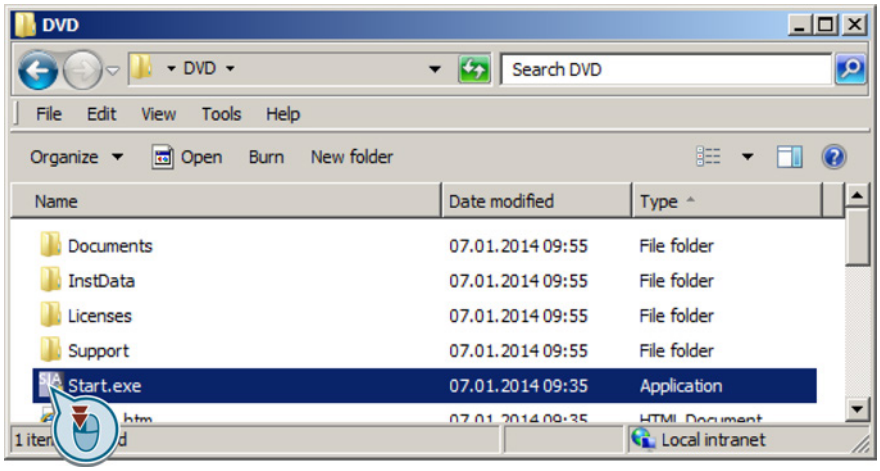


Figure 2-2 Starting SINUMERIK Integrate Create MyHMI /WinCC setup

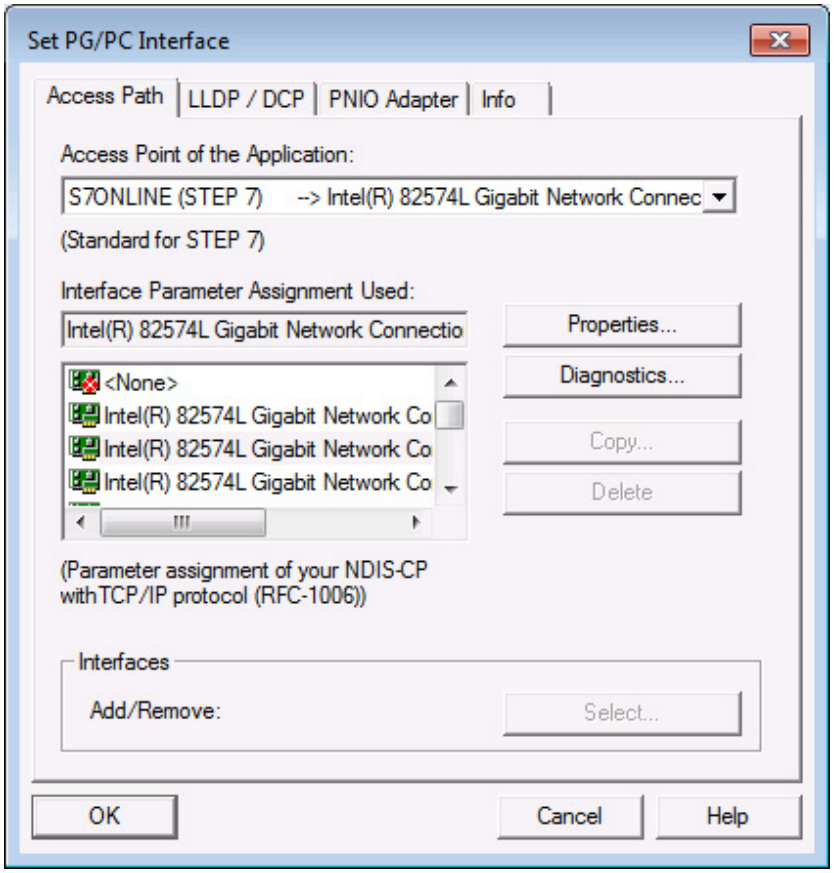
2.3 Configuring the PG/PC interface (PC systems)

The PG/PC interface of the PCU 50.5 must be set for operation via TCP/IP for "WinCC RT Advanced" Runtime to be able to read data from the NCU.

Procedure

To configure the PG/PC interface of the PCU 50.5, follow these steps:

1. Open the "Set PG/PC Interface" tool in the Control Panel.
2. Check the following settings:



Migrating projects

3

3.1 Migrating projects

You can migrate a SINUMERIK project as well as other projects from WinCC flexible to the TIA Portal.

As a result of the various operating systems that can be used, you cannot install "SINUMERIK HMI configuring package WinCC flexible 2008" and WinCC (TIA portal) on the same PG/PC.

For the migration, you need the migration tool "Project migration for WinCC flexible 2008 SP2/SP3", which you must select when setting up WinCC (TIA portal) in the product configuration.

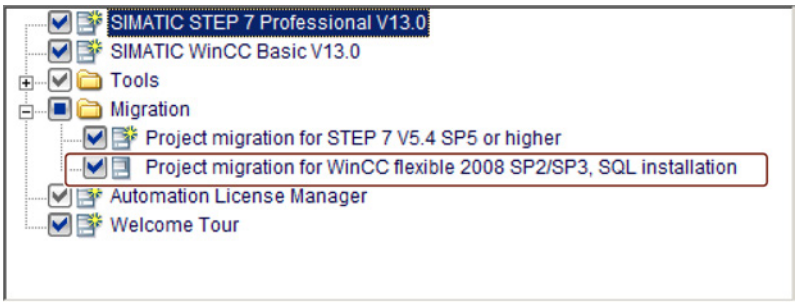


Figure 3-1 Setting up WinCC (TIA portal): Set the option box for project migration

Restrictions

The following restrictions apply to migration of SINUMERIK projects:

- You can migrate projects from WinCC flexible 2008 SP2
- WinCC flexible projects integrated in STEP 7 V5.x cannot be directly migrated (Page 34)

Read the information on migration provided below as well:

- SINUMERIK PCs and SIMATIC Panel PCs
- SIMATIC Panel

A tabular comparison of the functions in WinCC flexible and WinCC (TIA Portal) is available in the section Comparison of functions (Page 31).

Additional information

For additional information concerning the migration of projects from WinCC flexible, read the following information:

- Information system of the TIA Portal, section "Migrating projects and programs > Migrating projects in a TIA Portal project > Migrating WinCC flexible projects (Advanced)".
- FAQ WinCC (TIA portal) -- working with projects -- migrating projects (http://support.automation.siemens.com/WW/view/en/54702181).

Special features for SINUMERIK projects

The following HMI devices with SINUMERIK components can be migrated:

- SINUMERIK PCs and SIMATIC Panel PCs
- SIMATIC Panel

SINUMERIK PCs and SIMATIC Panel PCs

The following must be observed when migrating SINUMERIK projects:

- In the TIA Portal, you configure the PC system (e.g. PCU 50.5) instead of the operator panel front. This is changed automatically during the migration. You enter the screen resolution of the operator panel front in the runtime settings (Page 46).
- The input controls specific to HMI Advanced are not transferred.
- HMI controls for file management and NC editor are not supported.
- Integration in the m:n concept is not supported.
- The communication driver for the PLC-channel SINUMERIK PLC is switched over to the SIMATIC S7-300/400 communication driver.
- Automatic display of DB2 alarms is not supported.
  Import the DB2 alarms separately in the TIA Portal (Page 36).
- GUD tags are not automatically associated with the migration.
  Connect migrated GUD tags again after the migration. (Page 36)
- Multidimensional GUD arrays are not used in the TIA Portal even with PC systems (as known from WinCC flexible CE HMI devices).
  Linearize multidimensional GUD arrays or create new ones (Page 68).
- Use the WinCC TagConverter (Page 35) to convert tags from STEP 7 V5.x into a format suitable for import in WinCC.

SIMATIC Panel

- SIMATIC panels as of version 13.0.0.0 support the SINUMERIK parameter indexing method and must no longer contain the parameter number incremented by 1.
  If you configure a SIMATIC Panel as of version 13.0.0.0, adjust the configuration of the R parameters (Page 34).

3.2 Comparison of functions

SINUMERIK Integrate Create MyHMI /WinCC V13 comes with a number of functional changes as compared to the SINUMERIK HMI configuration software WinCC flexible 2008.

The tables below compare the range of functions of these two products:

- Functionality of SINUMERIK Integrate Create MyHMI /WinCC compared to the SINUMERIK HMI configuration package WinCC flexible 2008 for configuring a PC system
- Functionality of SINUMERIK Integrate Create MyHMI /WinCC compared to the SINUMERIK HMI configuration package WinCC flexible 2008 for configuring SIMATIC Panels

Additional information

- For information on the SINUMERIK HMI configuration package WinCC flexible 2008, see the corresponding configuration manual "SINUMERIK HMI Configuring Package WinCC flexible 2008"
- For an overview of the migration to SIMATIC WinCC V13, see the information system of the TIA Portal, keyword "Migration to WinCC V13"

Comparison of the functional scope

Table 3- 1 Functionality of PC systems (connection to NC and PLC)

Functionality	SINUMERIK HMI configuration software WinCC flexible 2008	SINUMERIK Integrate Create MyHMI /WinCC
Configuration for SINUMERIK HMI Advanced	x	-
Configuration for SINUMERIK Operate	-	x
Ethernet communication with SINUMERIK 840D sl	x	x
PROFIBUS communication with SINUMERIK 840D sl	-	-
MPI communication with SINUMERIK 840D sl	x	-
MPI communication with SINUMERIK 840D pl	x	-
Visualization of NC variables	x	x
Visualization of GUD variables	x	x
Visualization of machine and setting data	x	x
NC alarms	x	x
DB2 alarms	x	x
Integration into the m:n concept of SINUMERIK HMI Advanced (up to 8 NCUs)	x	-
Controls for HMI data management and NC editor	x	-
Input controls of SINUMERIK HMI Advanced	x	-
Control for activating part programs	-	x
Triggering specific PI services (for example, NC restart, setting a password)	x	x
Triggering a general PI service (using the "General PI service" function)	x	x
Coordinated language change SINUMERIK HMI - WinCC	x	x
Symbolic addressing of the PLC element in STEP 7 integration	x	x
Example project	x	x

Table 3- 2 Functionality of SIMATIC Panel (connection to NC and PLC)

Functionality	SINUMERIK HMI configuration software WinCC flexible 2008	SINUMERIK Integrate Create MyHMI /WinCC
Ethernet communication with SINUMERIK 840D sl	x	x
PROFIBUS communication with SINUMERIK 840D sl	x	x
MPI communication with SINUMERIK 840D sl	x	x
MPI communication with SINUMERIK 840D pl	x	-
Visualization of NC variables	x	x
Visualization of GUD variables	x	x
Visualization of machine and setting data	x	x
NC alarms and NC messages	x	x
Control for activating part programs	x	x
Triggering specific PI services (for example, NC restart, setting a password)	x	x
Triggering a general PI service (using the "General PI service" function)	x	x
Example project	x	-

3.3 Indexing of R parameters and GUD arrays

The method for indexing R parameters or GUD arrays in the TIA Portal depends on the employed Runtime version or the corresponding SIMATIC Panel:

- If you configure a WinCC RT Advanced with a version earlier than 13.0.0.0 or a SIMATIC Panel that uses an older Runtime version (CE Panel), note the following when indexing R parameters and GUD arrays:
  Address the R parameter higher by 1 than required during configuration. To display R5 in runtime, for example, you need to configure R6. (This indexing method is the same method used in WinCC flexible for SIMATIC CE panels.)

  When configuring GUD arrays, address the first GUD element with index 1 (as already done in WinCC flexible), e.g. `def CHAN INT MyGUD[3]`

  Address the individual elements with `MyGUD[1]`, `MyGUD[2]`, `MyGUD[3]`.
- If you configure a WinCC RT Advanced as of version 13.0.0.0 (for example, all SIMATIC Comfort Panels or a PCU 50.5 with WinCC RT Advanced), the exact R parameter you have configured is displayed in runtime.

3.4 Migrating WinCC flexible projects integrated in STEP 7 V5.x

Projects integrated in STEP 7 cannot be migrated.
If a WinCC flexible project is integrated in STEP 7, then WinCC flexible ES can be selected under "Project > Copy from STEP 7". After selecting an archive location, a copy of the integrated STEP 7 project is saved there. This autonomous WinCC project can then be migrated into the TIA Portal.

The connection of the symbols in STEP 7 is lost in the process.

3.5 Configure PLC variables symbolically

Use the WinCC TagConverter to convert tags from STEP 7 V5.x into a format suitable for import in WinCC.

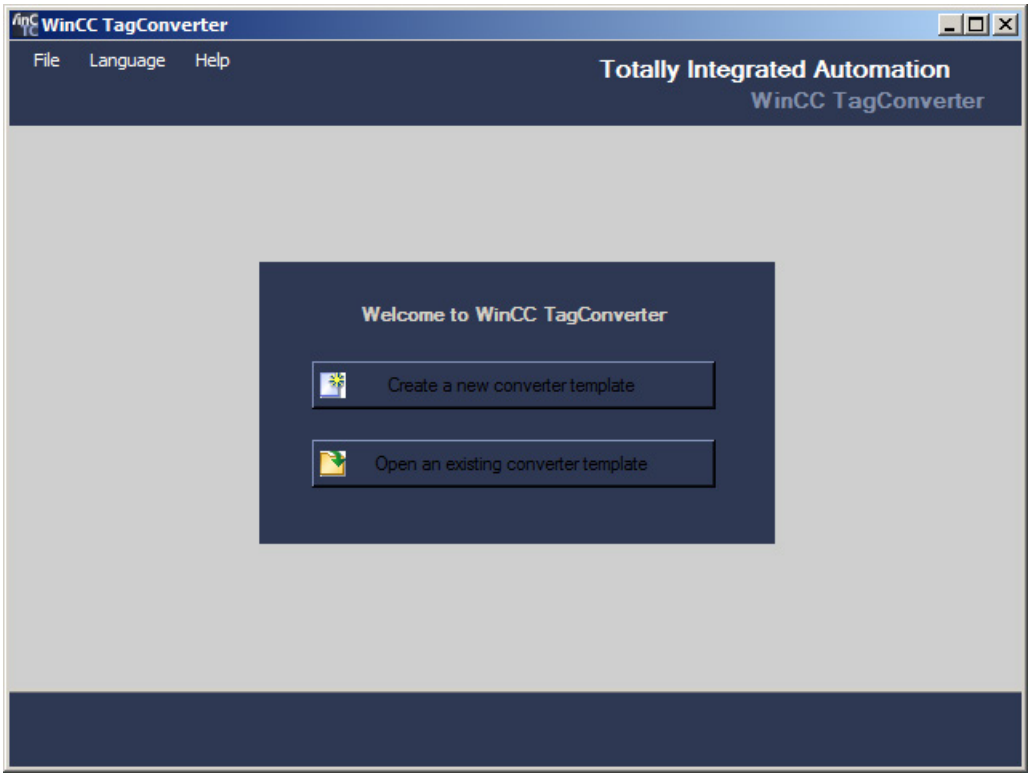


Figure 3-2 WinCC TagConverter

You can find this tool and relevant documentation on the Service & Support pages on the Internet:

Tag converter for WinCC (http://support.automation.siemens.com/WW/view/en/56078300)

3.6 Post processing of migrated GUD variables

After you have migrated a WinCC flexible project with GUD tags in the TIA portal, you must create a Creating a user database for global user data (Page 75) and reconnect the GUD tags in the "HMI tags" editor.

Precondition

- A user database with GUD tags suitable to the TIA Portal project is available.
  See Creating a user database for global user data (Page 75).

Procedure

To edit the migrated GUD tags, follow these steps:

1. In the project navigation in folder "HMI tags" click on the command "Show all tags", e.g. "PC system_1 > HMI_RT_1 > HMI tags > Show all tags".
   The editor "HMI tags" is opened, in which all tags are on display, including migrated GUD tags.
2. In the "Address" field, click on the "Expand" symbol.

   The dialog for selecting the SINUMERIK tags opens. You can find the migrated GUD tags under "GUD: dynamic user data".

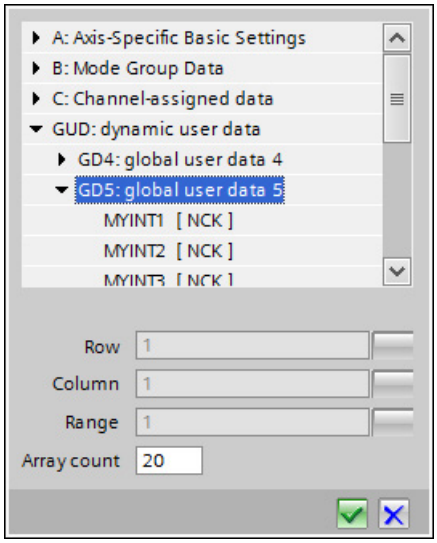


Figure 3-3 Dialog for selecting SINUMERIK tags with GUD

3. Navigate through the structure to the desired tag, select it and click the "Confirm" icon.
4. Click on the "Expand" icon in the "Address" field for each migrated tag, and select the GUD tag to be addressed.

Result

The GUD tags are reconnected.

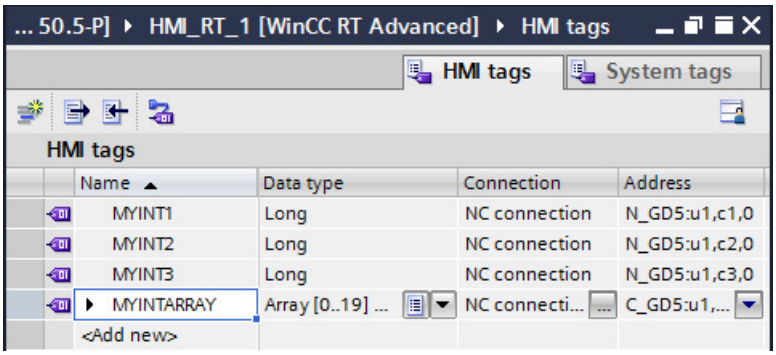


Figure 3-4 GUD tags associated with newly connected address and symbolic name

You must subsequently linearize multi-dimension GUD arrays. See Overview (Page 68).

Device configuration

4

4.1 Configurable user interface

PC systems

For PC systems with WinCC RT Advanced, the complete user interface is available for configuring screens for an additional operating area of a SINUMERIK Operate user interface.

Because you do no select a specific operator panel front for the configuration of a PC system, all available function keys are basically displayed on the added screens.

You can specifically set the screen resolution (Page 46) of the operator panel front and also subsequently change it.

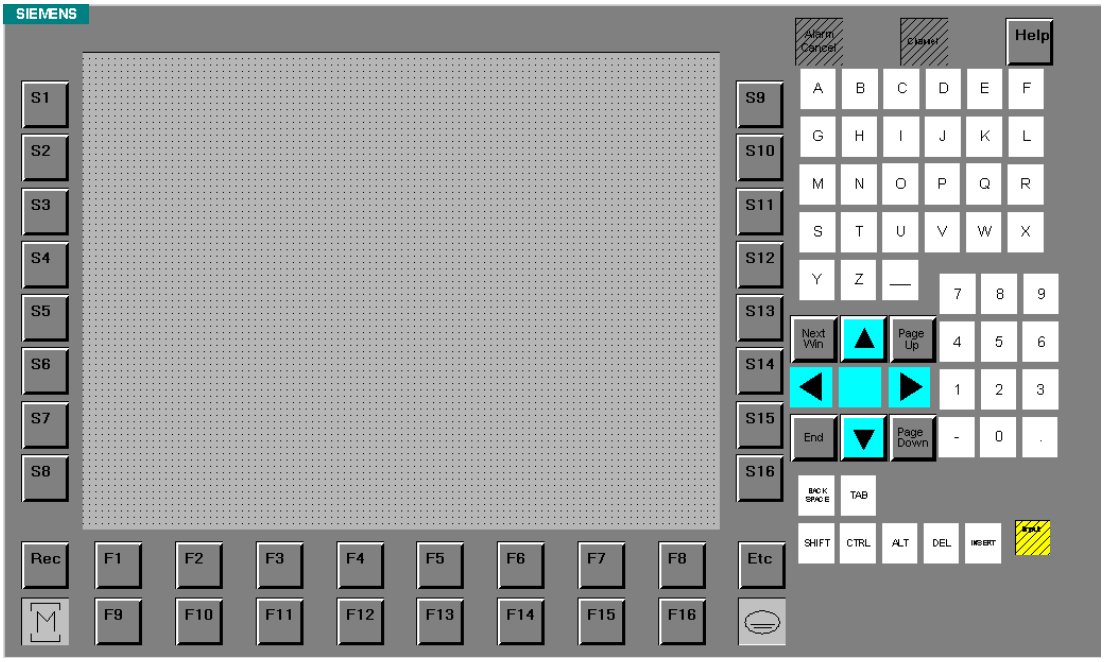


Figure 4-1 User interface of a screen for configuration of the PCU 50.5

When you configure the function keys, make sure you only use the keys that are actually available on the operator panel front.

SIMATIC Panel

If you configure a SIMATIC Panel, you must insert a specific panel (for example, KP 1200 Comfort). The only buttons displayed for the user interface of a screen are those that are available on the respective SIMATIC Panel.

In addition, the screen resolution is already set specifically for the added SIMATIC Panel and cannot be changed.

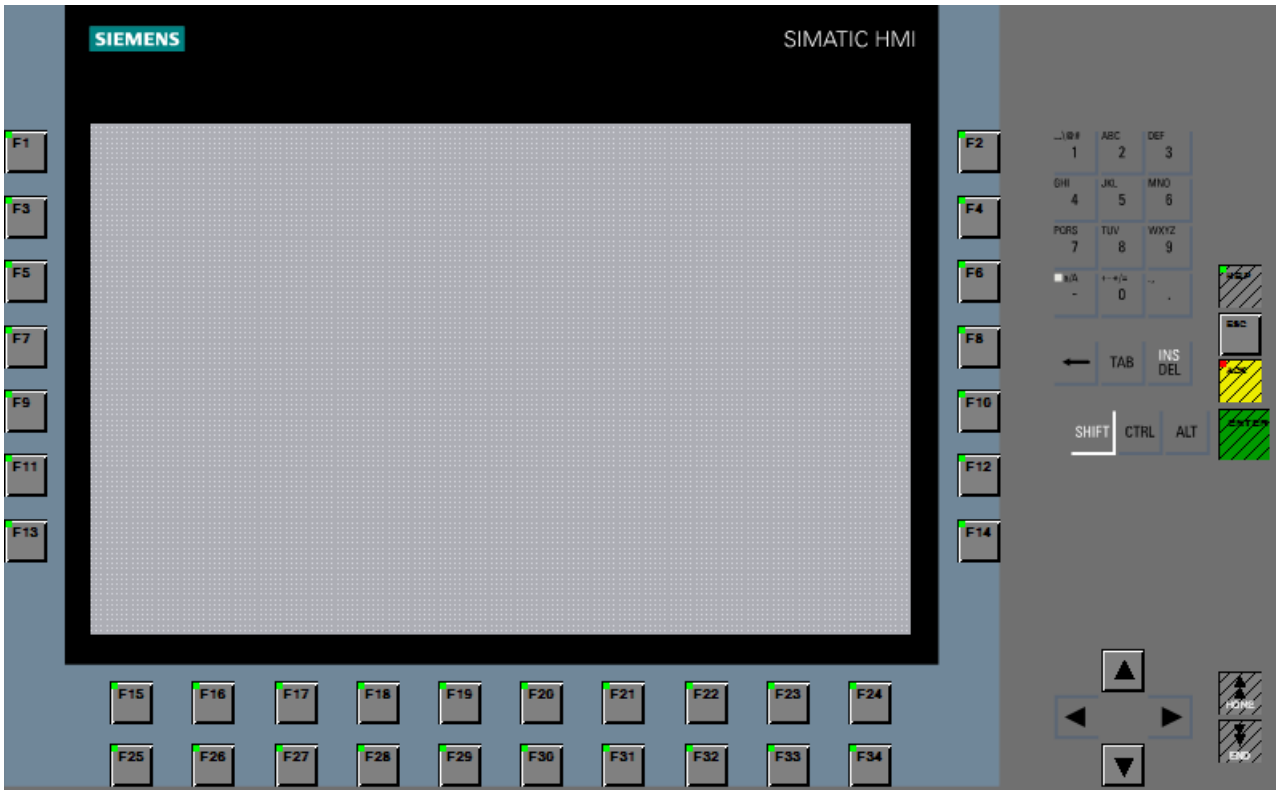


Figure 4-2 User interface of a screen for a SIMATIC Panel KP 1200 Comfort

See also

Loading and integrating a configuration (PC systems) (Page 125)

4.2 Runtime configuration

Overview

With the Runtime WinCC RT Advanced, you can adapt the user interface of SINUMERIK Operate on a PC system (Page 19) or SIMATIC Panel with SINUMERIK functionality (Page 20).

Make a different selection for Runtime or the Runtime version depending on the HMI device used:

- If you add a SIMATIC Panel, you do not need to insert Runtime separately. SIMATIC Panels have integrated Runtime, which is automatically available when added. You select the Runtime version when you add the SIMATIC Panel.
- When you add a PC HMI device and switch to the device view, Runtime is shown in the hardware catalog. When you select Runtime, you can select the Runtime version in the "Information" area of the hardware catalog.

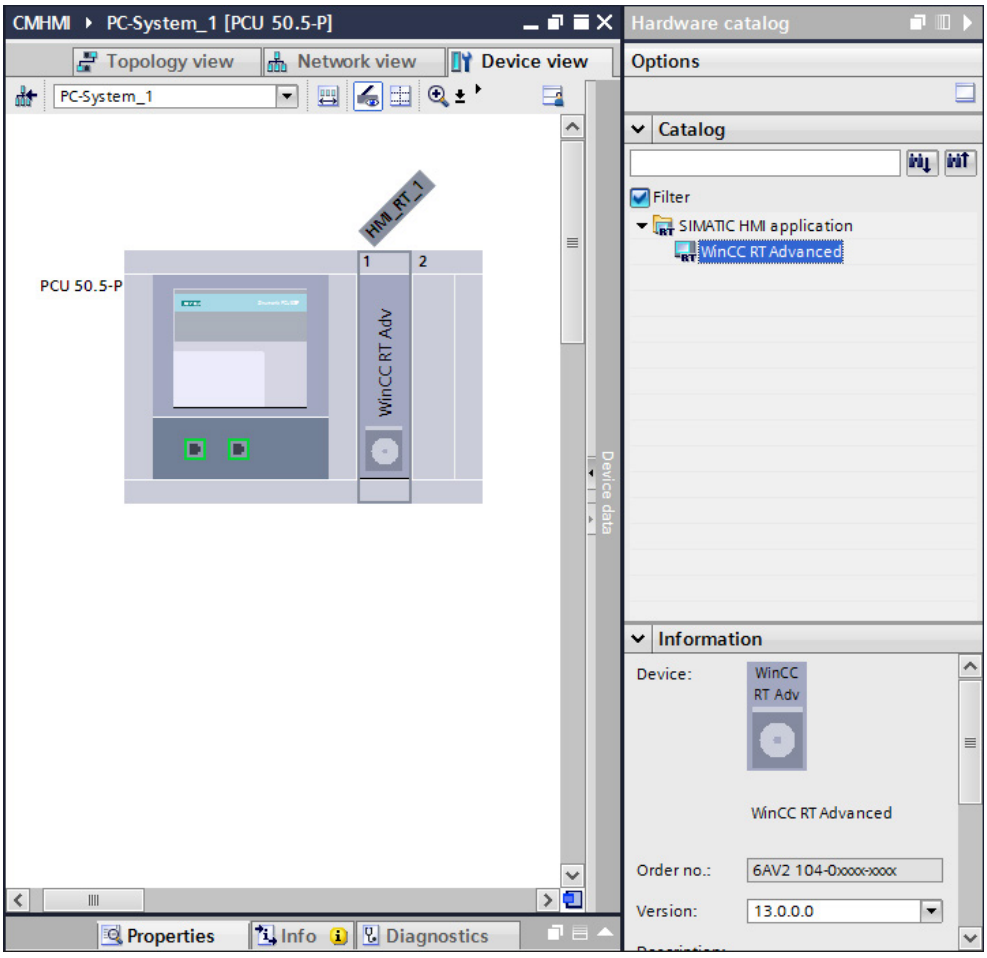


Figure 4-3 Device view with hardware catalog (on the right in the image)

4.3 Inserting PC system and Runtime

The following components in WinCC allow an operating area to be configured for a SINUMERIK Operate user interface:

- SINUMERIK PC system (e.g. PCU 50.5-P with Windows 7)
- WinCC RT Advanced

Requirement

- The TIA Portal has been started.
- A project is open or created.
- The project view is active.

Procedure

To add a PC system and Runtime WinCC RT Advanced, follow these steps:

1. Click "Add new device" in the project tree and click on the "PC systems" button.

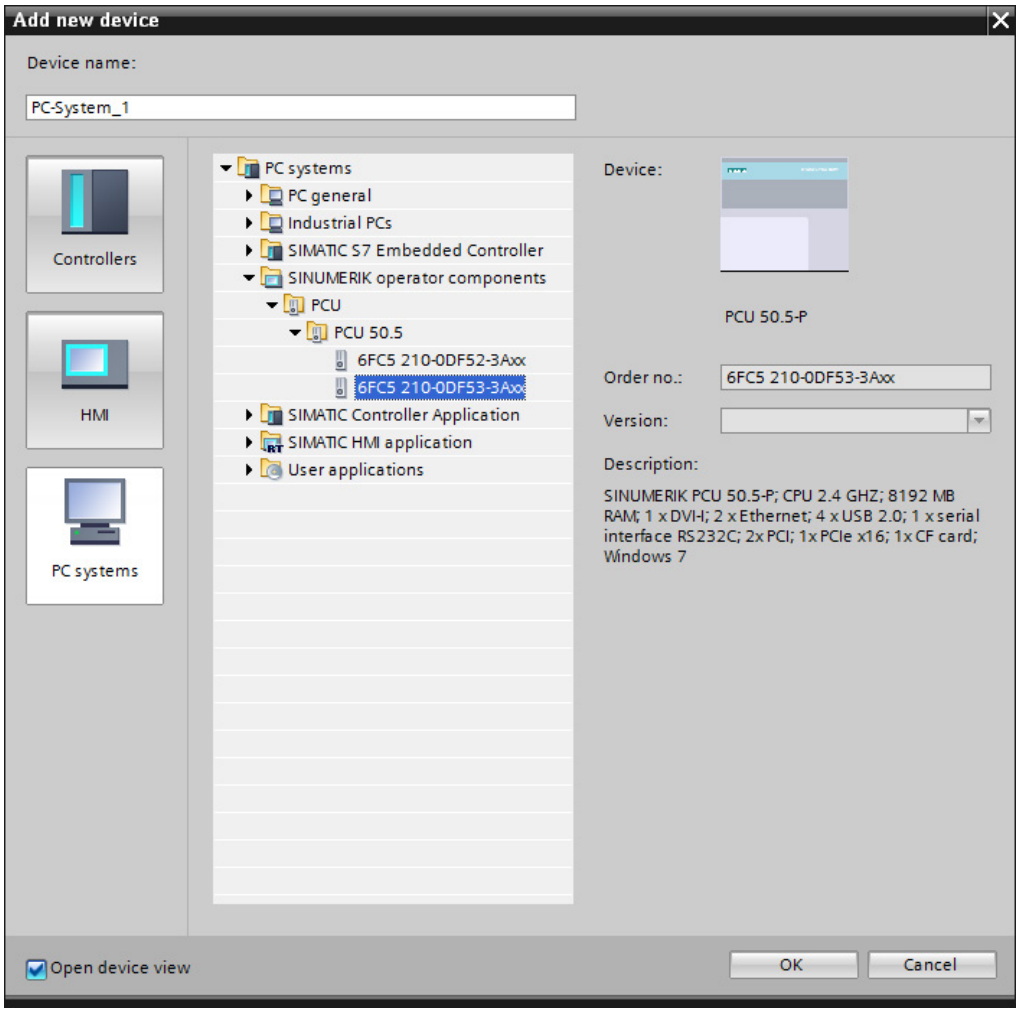


Figure 4-4 Add PC system

All available PC systems are displayed in the folder structure.

2. Under "SINUMERIK Operator Components > PCU", select an operator component (e.g. "PCU 50.5"), assign a device name (e.g., "PCU_1"), then confirm with "OK".

   The device is added, and the device view opens.

3. In the hardware catalog, select the runtime software from "SIMATIC HMI application > WinCC RT Advanced", change the version in the "Information" section, if needed, and drag it to a free slot of the device in the device view.

   The configured Runtime version must match the current Runtime version in use on the PC system.

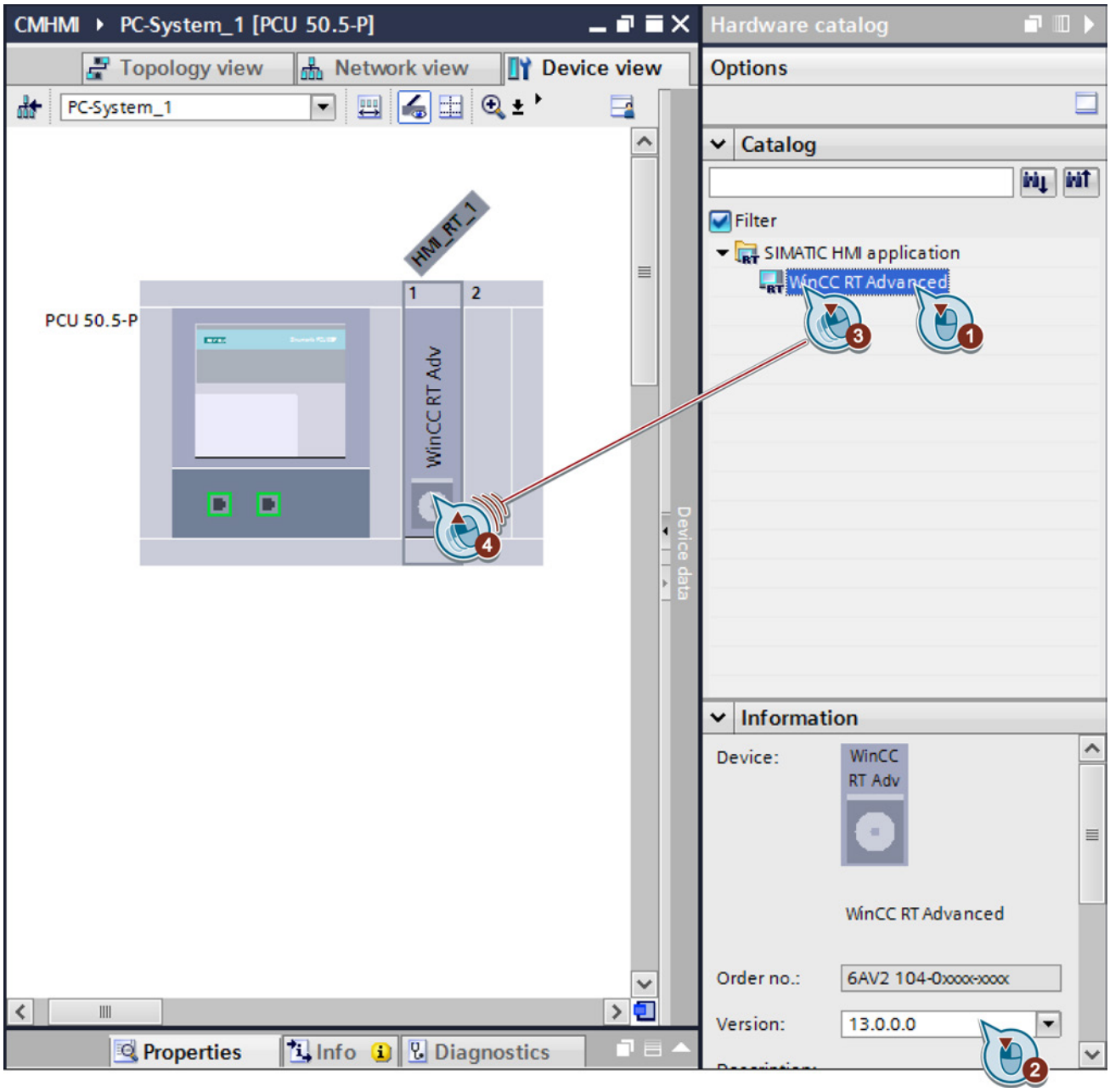


Figure 4-5 Adding WinCC RT Advanced

Result

In the project tree, the configured runtime (e.g. "HMI_RT_1 [WinCC RT Advanced]") is added to the created device (e.g. "PC-System_1 [PCU 50.5-P]]").

This view provides the following configuration editors:

- "Connections" (Page 53)
- "HMI variables" (Page 61)
- "HMI messages" (Page 79)
- "Screens" (Page 97)

Next, you set the screen resolution of your operator panel front (Page 46).

4.4 Configuring screen resolution (PC systems)

Introduction

If you configure a PC system, the default for the screen resolution of the HMI device in runtime is 800x600. Therefore, depending on the HMI device you are using, you may need to adjust this setting so that the configured picture is a full screen on the target system.

If you enter the wrong screen resolution here, the scroll bars or the picture will not fill the screen on the HMI device.

If you later change the screen resolution in the runtime settings, you first need to enable the "Fit to screen" option in the settings before making the settings in the TIA Portal (see below).

Requirement

- A project with a PC system and Runtime software has been created.
  See: Inserting PC system and Runtime (Page 42)
- The project view is active.

Procedure

To set the screen resolution of the target system, proceed as follows:

1. Activate the "Fit to screen" option button in the "Tools > Settings > Visualization > Resize screens and screen objects" menu.
2. Open the runtime settings in the project tree, for example, under "PC_System_1 > HMI_RT_1 > Runtime settings > Screen resolution".
3. Make the appropriate setting for your operator panel front:

Operator panel front	Resolution	Screen format
OP 010	640 x 480	Standard
	800 x 480	Widescreen
OP 012	800 x 600	Standard
	1366 x 768	Widescreen
OP 015	1024 x 768	Standard
OP 019	1280 x 1024	Standard
	1920 x 1080	Widescreen

Note

"Screen resolution" setting must match actual resolution of the operator panel front used

If the wrong screen resolution has been entered in the Runtime settings, the scroll bars or the picture will not fill the screen on the HMI device at runtime.

If the screens are not displayed correctly in runtime, adjust the setting as described above.

4. To prevent the display of scrollbars, activate full-screen mode with "Runtime settings > General".

4.5 Configuration of the screen size (PC systems)

To prevent the configured screens from covering the header of SINUMERIK Operate, for example, you can reduce the size of the configured screens.

You can change this setting at any screen. The setting is always applied to all screens.

Using drag-and-drop to make the screen or template smaller.

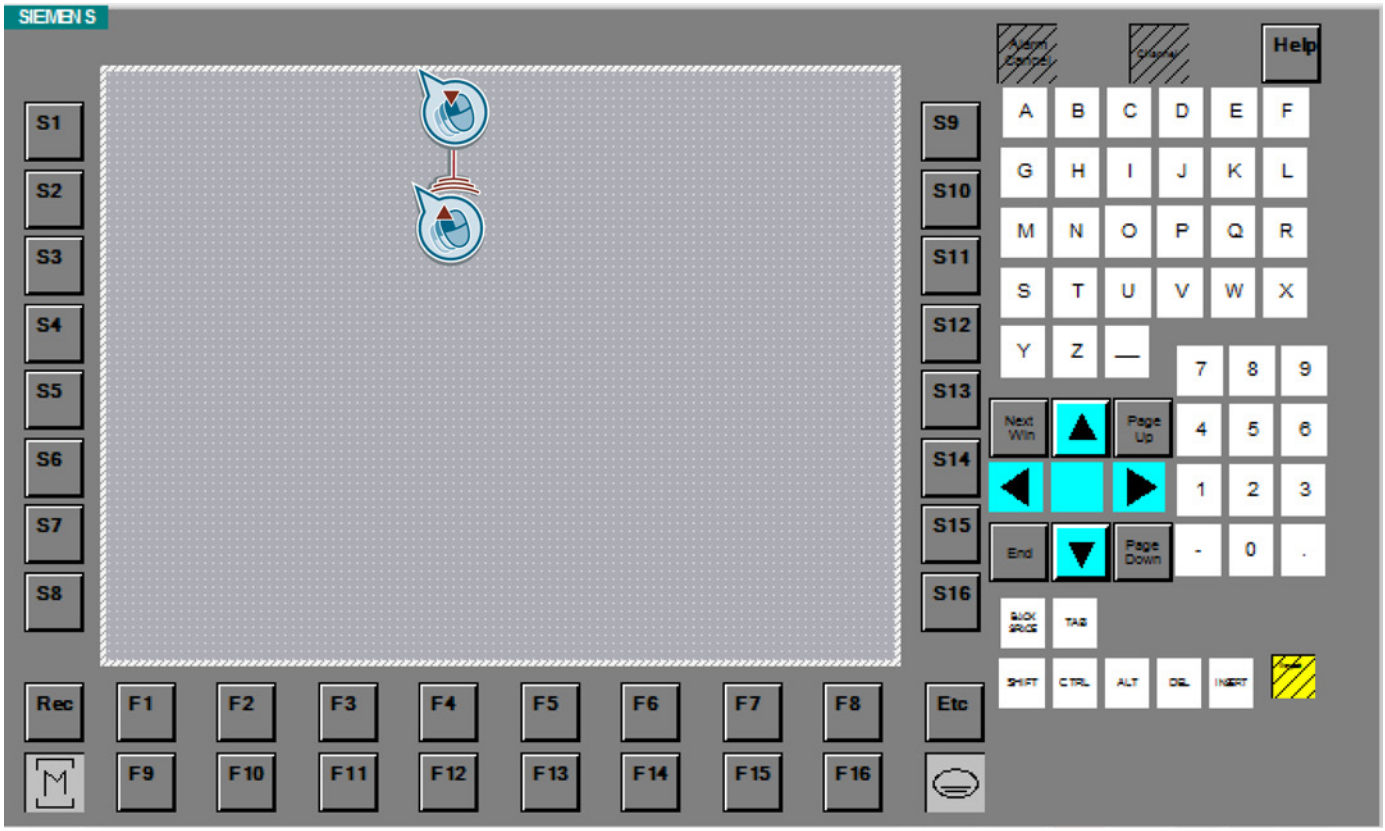


Figure 4-6 Changing the screen size

You can find more information about master copies in the information system of the TIA Portal, section "Visualizing processes > Creating screens > Basics > Working with master copies".

4.6 Adding a SIMATIC Panel

The following components are required in WinCC to use the SINUMERIK functionality on a SIMATIC Panel:

- Suitable SIMATIC Panel/Comfort Panel/Multi Panel

Requirement

- The TIA Portal has been started.
- A project is open or created.
- The project view is active.

Procedure

To add a SIMATIC Panel, follow these steps:

1. In the project tree, click on "Add new device" and click the "HMI" button.

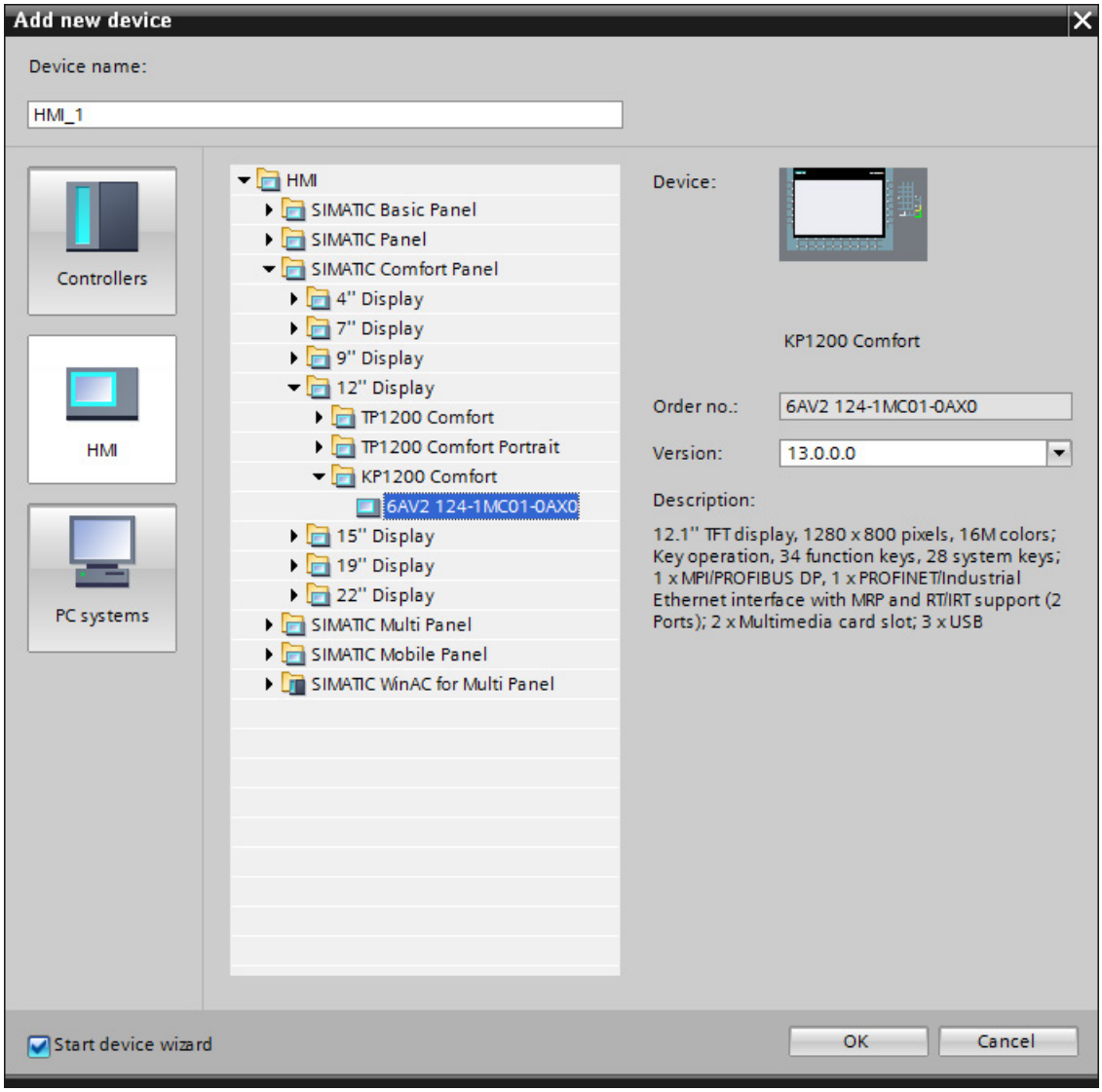


Figure 4-7 Adding a SIMATIC Panel

The "Add new device" dialog box opens and the folder structure displays all available SIMATIC Panels.

2. Make the required settings:

Element	Purpose
Device name	Assign a device name (e.g. "HMI_SIMATIC_Panel ").
Folder structure	Under "HMI", select a SIMATIC Panel (for example, "MP 177 6" mono DP")
Version	Runtime is integrated for SIMATIC Panels. Select the required Runtime version in this drop-down list.
Open the device wizard	To start the HMI device wizard after adding the device, select this check box. Use the HMI device wizard to define the basic settings for your HMI device, for example, the screen layout or the connection to your PLC. Note that you still need to make other settings in the device view, for example, you need to create the connection to the NC.

3. Click "OK" to confirm your settings.

Result

The device is added and, depending on your settings, the HMI device wizard or the project view opens.

The following editors are available in the project tree below the device (for example, "HMI_SIMATIC_Panel [MP 177 6" mono DP]"):

- "Connections"
- "HMI variables"
- "HMI messages"
- "Screens"

Configuring connections

5

5.1 Overview

You can create two different types of connections in the TIA Portal, integrated and non-integrated connections:

- You configure integrated connections in the "Devices & Networks" editor (Page 54) after you have added the communication partner (e.g. integrated PLC of the NCU).
  - You can create the connection to the PLC as integrated connection.
  - An integrated connection to the PLC is required in order to import DB2 alarms.
  - However, the "Integrated connection" connection type is not available for the connection to the NC.
- You create non-integrated connections in the "Connections" editor (Page 57). The communication partner needs not be added in this case (for example, integrated PLC of the NCU).

For more information about integrated and non-integrated connections, see the information system of the TIA Portal, keyword "non-integrated connection" or "integrated connection".

5.2 Configure an integrated connection

You can create the HMI connection in a user-friendly fashion via the network view.

This function can only be used to generate a connection to the PLC. The connection to the NCK must be configured as a non-integrated connection (Page 57).

Requirement

- The SINUMERIK 840D sl TIA Portal Toolbox is installed.

  (Required to configure a SINUMERIK NCU)
- An NCU has been added.
- A PC system with WinCC RT Advanced or a SIMATIC Panel has been added.
  See Inserting PC system and Runtime (Page 42)
- The network view is active.

Procedure

To create an integrated connection to the PLC, follow these steps:

1. Click the "Connections" button and select "HMI connection" from the drop-down list.

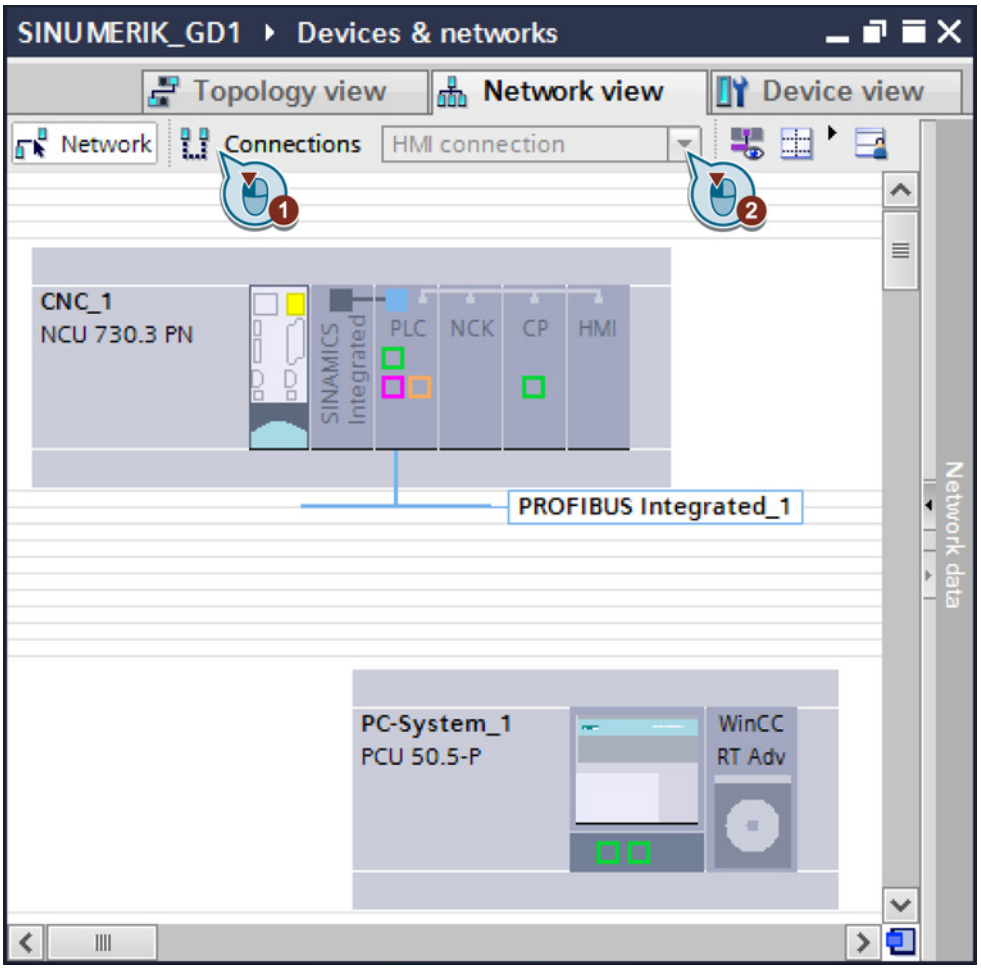


Figure 5-1 Connections

The components that you can connect (PLC and WinCC RT) have a colored background.

2. Use drag-and-drop to create a connection from the WinCC RT Advanced or the SIMATIC Panel to the PLC.

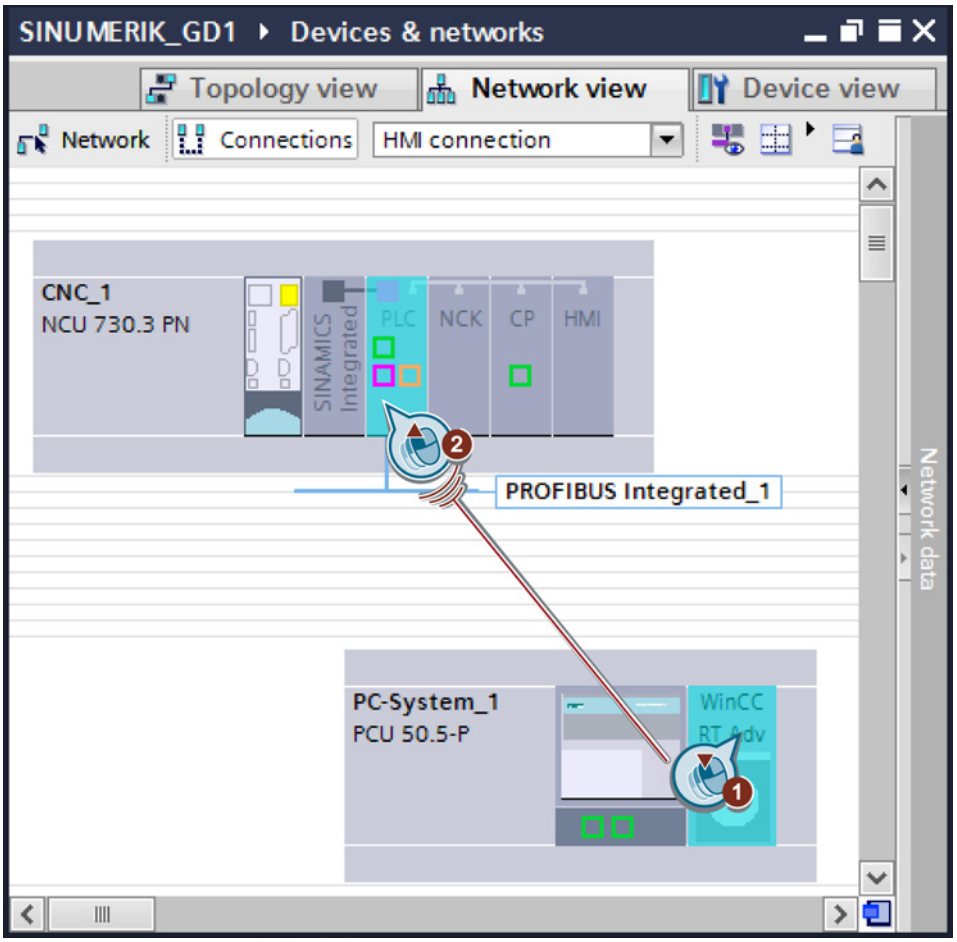


Figure 5-2 Creating a connection with drag-and-drop - to PCU 50.5-P and WinCC RT Advanced in the example

Result

The connection to the PLC is created as an integrated connection and it is automatically assigned a name.

You can see the connection in the "Connections" editor and change the assigned name, if necessary.

5.3 Configuring a non-integrated connection

You create a connection to each of the PLC and NC subcomponents in the "Connections" editor. The communication driver to be selected depends on the subcomponent:

- PLC: Communication driver "SIMATIC S7-300/400"
- NC: Communication driver "SINUMERIK NC"

Requirement

- You have created a project.
- The HMI device to be configured has been added (SIMATIC Panel or PC system with WinCC RT Advanced).

Procedure

To create a non-integrated connection, follow these steps:

1. In the project tree, navigate to the device to be configured.
2. Double-click "Connections" in the project tree below the device, for example, "PC-System_1 > HMI_RT_1 > Connections".
   The editor for connections opens.

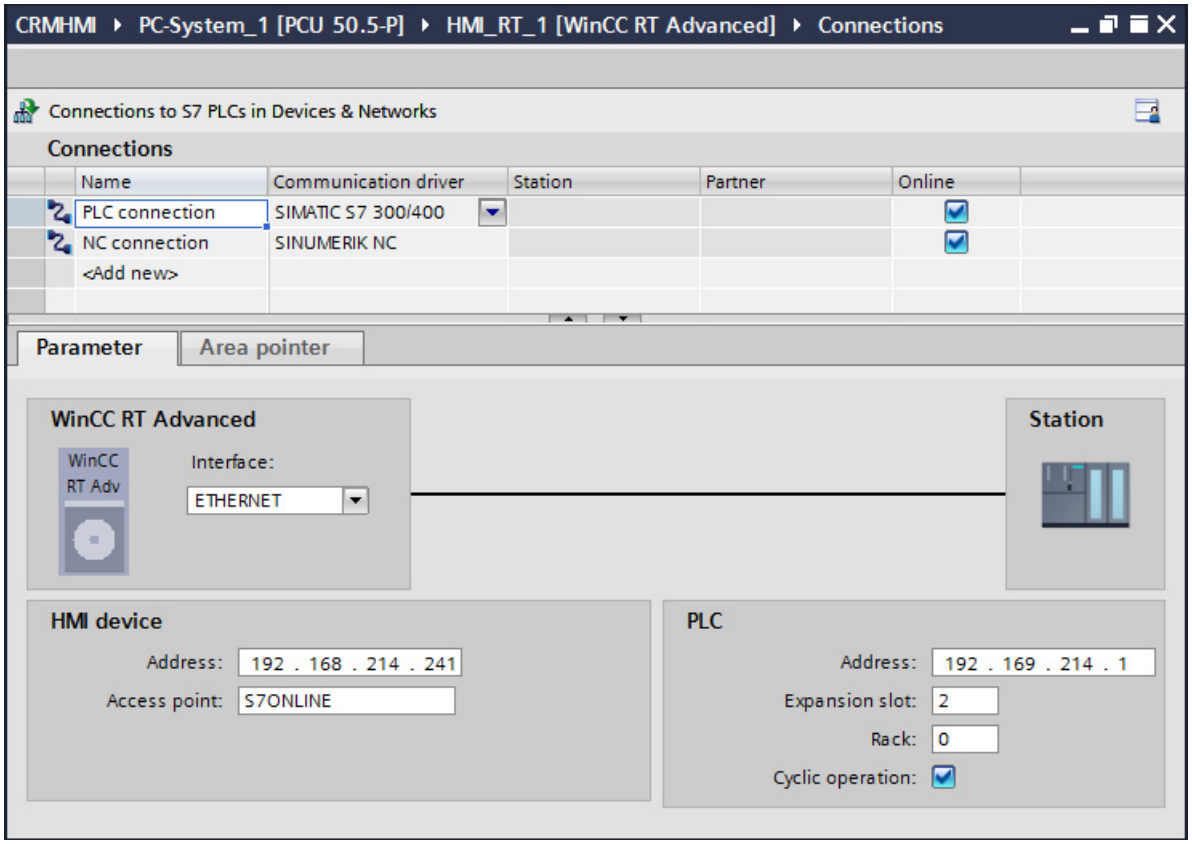


Figure 5-3 Editor for connections with two non-integrated connections

3. Double-click "<Add>" in the "Name" column and assign a meaningful name, for example, "Connection NC".

4. Select the appropriate option from the "Communication drivers" drop-down list:
   - Connection to the PLC: "SIMATIC S7-300/400"
   - Connection to NC: "SINUMERIK NC"
5. In the "Parameters" tab, make the required settings for each individual connection :
   - In the "Interface" drop-down list, select the required option, for example, "ETHERNET". The interface must be identical for both connections.

     Note

     The interface type must match

     Both connections must use the same interface type.

     Both connections will be marked as being faulty if the interface type does not match.

   - Specify the slot in the "Controller" section:
     Connection to the PLC: Expansion slot 2
     Connection to the NC: Expansion slot 4
   - Define an IP address in the "Controller" section. The IP address entered must be identical for both connections (connection to PLC and connection to NC).

     Note

     Operating PCU 50.x on the company network

     If the PCU 50.x is not in the system network, but operated in a company network, then the IP address allocated via the DHCP server must be entered for the HMI device.

Configuring variables

6

You can create PLC tags in the "HMI tags" editor.

The PLC tags available depend on the selected connection and the communication channel defined in the connection:

- For the **"SIMATIC S7-300/400" communication channel** the range of tags that can be used corresponds to the S7-300/400 channel.
  You can find additional information in the information system of the TIA Portal, keyword "Tag, creating an external tag".
- For the **"SINUMERIK NC" communication channel**, the following PLC tags can be used:
  - All NC tags of the operator panel interface (Page 63)
  - All general, channel-specific and axis-specific machine and setting data (Page 63)
  - GUD tags (user-defined PLC tags) (Page 66)

  These variables can be configured using their symbolic name.

Additional information

General information about working with tags in WinCC is available in the information system of the TIA Portal, section "Visualizing processes > Working with tags".

6.1 Indexing of R parameters and GUD arrays

The method for indexing R parameters or GUD arrays in the TIA Portal depends on the employed Runtime version or the corresponding SIMATIC Panel:

- If you configure a WinCC RT Advanced with a version earlier than 13.0.0.0 or a SIMATIC Panel that uses an older Runtime version (CE Panel), note the following when indexing R parameters and GUD arrays:
  Address the R parameter higher by 1 than required during configuration. To display R5 in runtime, for example, you need to configure R6. (This indexing method is the same method used in WinCC flexible for SIMATIC CE panels.)

  When configuring GUD arrays, address the first GUD element with index 1 (as already done in WinCC flexible), e.g. `def CHAN INT MyGUD[3]`

  Address the individual elements with `MyGUD[1]`, `MyGUD[2]`, `MyGUD[3]`.
- If you configure a WinCC RT Advanced as of version 13.0.0.0 (for example, all SIMATIC Comfort Panels or a PCU 50.5 with WinCC RT Advanced), the exact R parameter you have configured is displayed in runtime.

6.2 Configuring NC tags

6.2.1 Overview

You can select SINUMERIK tags in the "HMI tags" editor in the "Address" field, if the NC connection has been selected in the "Connection" field.

Note

Methods for indexing R parameters and GUD arrays

The method for indexing R parameters and GUD arrays depends on the employed Runtime version or SIMATIC Panel.

See: Indexing of R parameters and GUD arrays (Page 62)

Precondition

- An NC connection with communication channel "SINUMERIK NC" has been created.

Procedure

To create an external tag, proceed as follows:

1. In the project navigation, open the "HMI tags" folder and double-click on "Show all tags" or on a tag table.
2. In the tag table, double-click in the "Name" column on "Add".
   A new tag is created.
3. Select a previously created connection with the "SINUMERIK NC" communication driver in the "Connection" field.
4. Click the "Expand" icon in the "Address" field.
   The dialog for selecting SINUMERIK tags opens.

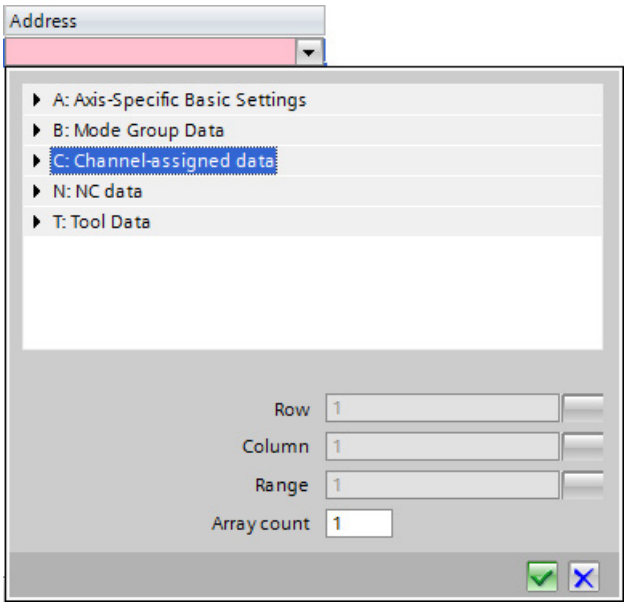


Figure 6-1 Dialog for selecting SINUMERIK tags

5. Select the required tag in the structure, adapt the values, if necessary (for example, for the channel or axis), and click "Confirm".
6. Make optional settings in the inspector window under "Properties > Properties > General":

Note

Creating tags directly at the point of use

You can also create new tags directly at the point of use, for example, at an I/O field. To do this, click the "Add" button in the object list. You then configure the new tag in the Inspector window.

Additional information

You can find information on the structure and the processing of NC tags in the following documentation:

- List manual for NC tag and interface signals (LIS2sl), section "NC tag".
- Online help "Help for OPI tags SINUMERIK 810D, 840D, FM-NC", opened in the TIA Portal via the tooltip of a specific tag.

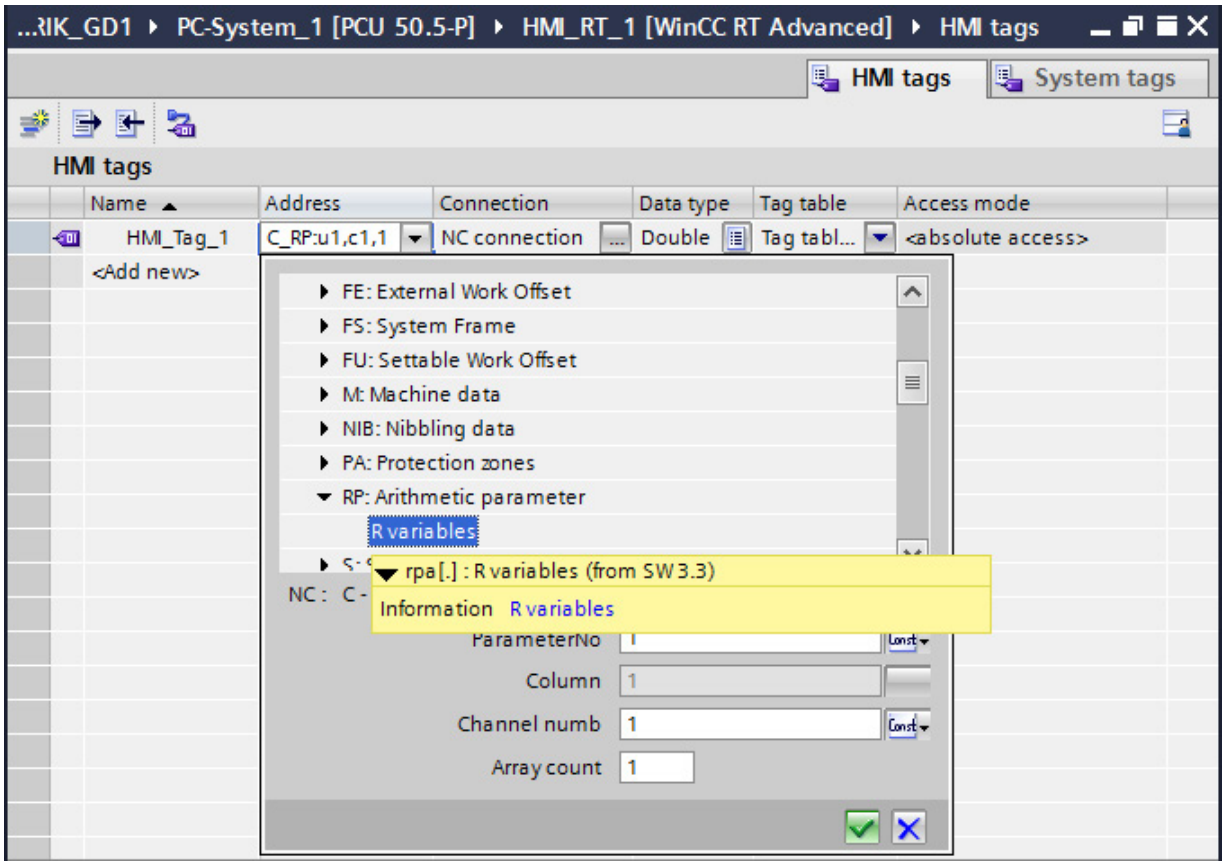


Figure 6-2 Opening via tooltip of the NC tags

6.3 Configuring GUD tags

6.3.1 Introduction

Overview

GUD are Global User Data that users can define themselves on the NCU and subsequently use in the NC. WinCC lets you visualize these tag values.

- To use the GUD tags of the NCU in the TIA Portal, you must first import (Page 73) them.
- If you work with GUD arrays, read the corresponding Notes for GUD arrays in the TIA Portal (Page 68).
- Whenever you change the DEF files, you must also repeat the import or recreate the user database (Page 73).
- If you have extended the GUD tags offline in theTIA portal, you must copy the modified DEF files back to the NCU (Page 77).

  The DEF files of the GUD database used in the TIA portal must match the DEF files in the NC in order that the runtime WinCC RT Advanced can correctly access the GUD tags.

  At an early phase in the configuring, coordinate the GUDs to be used on the NCU and in the TIA Portal. If subsequent additions are required, attach these at the end of the DEF files, below the existing data. If you make changes to the complete DEF file, you must reconnect all GUD of this DEF file.

Note

Data consistency between the TIA Portal and SINUMERIK Operate

If you change something in the data in SINUMERIK Operate after the import into the TIA portal, these changes are not automatically synchronized between the systems.

Repeat the import process, therefore, if you change something in the GUD data in SINUMERIK Operate.

Character explanation

Table 6- 1 Character explanation for the definition of GUD tags

Value	Meaning
NCK	Global PLC tag
CHAN	Channel-specific tag
Type	Tag type (BOOL, CHAR, INT, REAL, STRING)
Name	Tag name
Rows	Line number
Columns	Column number

File types

The following file types are of importance when working with GUD tags:

- **Definition files of dynamic user data: <file name>.def**

  The dynamic user data is communicated to the NCK using these definition files.

  These files are required during Runtime on the PLC.

  These files are required for the GUD tool "WinCC import NC userdata" on the configuration PC.

- **File of the user database: Userdata.mdb**

  The file of the user database is required to display user data within WinCC TIA Portal V13.x during tag configuration.

6.3.2 Configuring GUD arrays

6.3.2.1 Overview

Introduction

GUDs in the NCU can also be defined as arrays, specifically as one, two and three-dimensional arrays.

Table 6- 2 Definition of the GUD arrays in the NCU

GUD definition	Example
DEF {NCK|CHAN} type Name[number of lines, number of columns]	DEF NCK REAL REALNGUD[2,3]
	DEF CHAN REAL REALCGUD[2,3]
DEF {NCK|CHAN} STRING[number of characters] Name[number of strings]	DEF NCK STRING[8] NTEXT[5]

In WinCC (TIA Portal), however, multi-dimensional arrays must be linearized, which means access is only performed via a single index:

- In one-dimensional arrays, this is simply the required index, starting at 0.
- With multi-dimensional arrays, the index must be calculated.

If, in WinCC (TIA Portal) you wish to dynamically access a GUD array via an index tag, observe the associated notes (Page 72).

Note

Methods for indexing R parameters and GUD arrays

The method for indexing R parameters and GUD arrays depends on the employed Runtime version or SIMATIC Panel.

See: Indexing of R parameters and GUD arrays (Page 62)

Table 6- 3 Addressing array elements in WinCC

Control system	WinCC configuration
Tag [A1, A2]	C_GD4:u1,c"x", (A1*A2)-1

- "x" stands for the number of the GUD in the DEF file.
- "A1" stands for the maximum index of dimension 1.
- "A2" stands for the maximum index of dimension 2.

For additional information on converting or linearizing GUD arrays, please refer to the following chapters:

- Linearization based on the sorting in SINUMERIK Operate (Page 70)
- Converting a three-dimensional GUD array for linear access (Page 71)

Example

Linearizing a two-dimensional array, e.g. [2,3] looks like this:

Table 6- 4 Example for the linearization of a two-dimensional index'

Two-dimensional index in the NC	One-dimensional index in WinCC
0 0	0
0 1	1
0 2	2
1 0	3
1 1	4
1 2	5

The example is two-dimensional and has three elements in each dimension.

Table 6- 5 Example for addressing array elements in WinCC

Control system	WinCC configuration
REALGUD[0,0]	C_GD4:u1,c"x",0
REALGUD[0,1]	C_GD4:u1,c"x",1
REALGUD[0,2]	C_GD4:u1,c"x",2
REALGUD[1,0]	C_GD4:u1,c"x",3
REALGUD[1,1]	C_GD4:u1,c"x",4
REALGUD[1,2]	C_GD4:u1,c"x",5

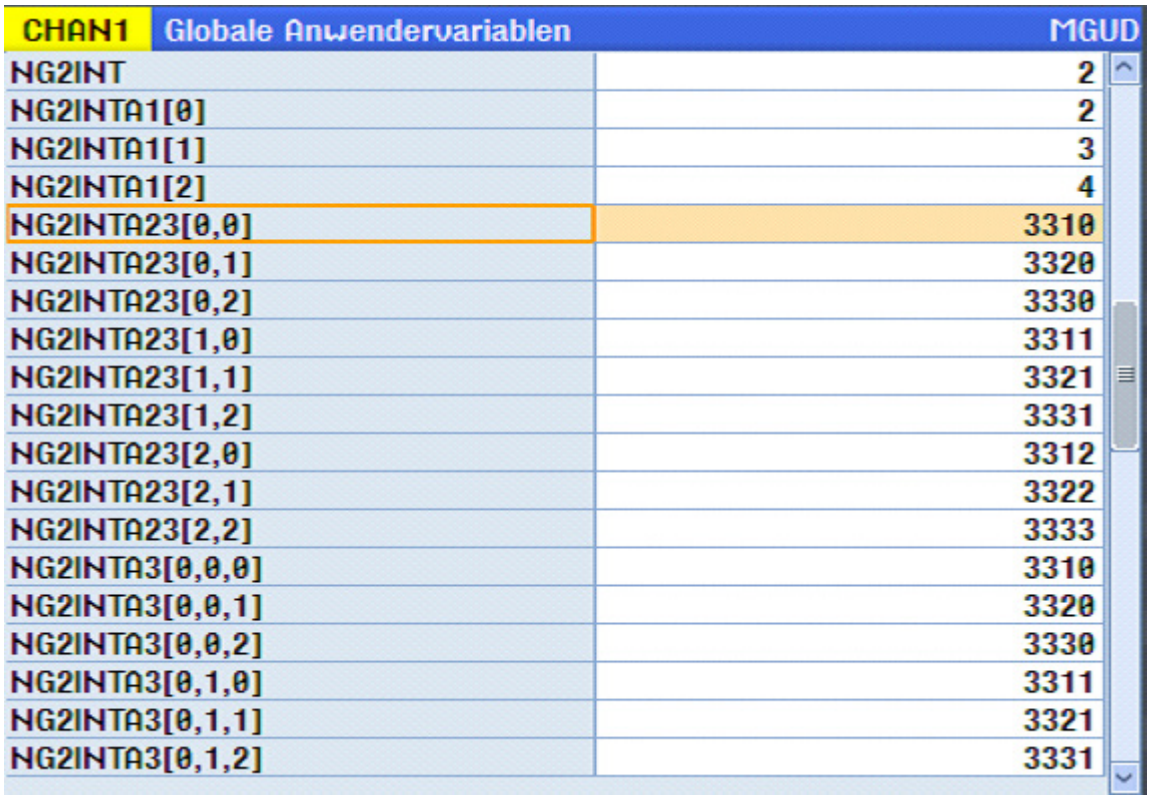
- GUD definition: DEF {NCK|CHAN} type Name[number of lines, number of columns]
- "x" stands for the number of the GUD in the DEF file.

6.3.2.2 Linearization based on the sorting in SINUMERIK Operate

Independent of whether an array is two or three dimensional, you can linearize the sorting in SINUMERIK Operate.

Open a GUD array in SINUMERIK Operate under "Parameter > User tags > Global GUD > GUD selection".

- The uppermost element [0,0] is addressed with index=0.
- The uppermost element [0,1] is addressed with index=1.
- etc. until the lowest or last element, which is addressed with MaxIndex.



CHAN1	Globale Anwendervariablen	MGUD
NG2INT		2
NG2INTA1[0]		2
NG2INTA1[1]		3
NG2INTA1[2]		4
NG2INTA23[0,0]		3310
NG2INTA23[0,1]		3320
NG2INTA23[0,2]		3330
NG2INTA23[1,0]		3311
NG2INTA23[1,1]		3321
NG2INTA23[1,2]		3331
NG2INTA23[2,0]		3312
NG2INTA23[2,1]		3322
NG2INTA23[2,2]		3333
NG2INTA3[0,0,0]		3310
NG2INTA3[0,0,1]		3320
NG2INTA3[0,0,2]		3330
NG2INTA3[0,1,0]		3311
NG2INTA3[0,1,1]		3321
NG2INTA3[0,1,2]		3331

Figure 6-3 Screen "Global GUD > GUD selection" in SINUMERIK Operate: The selected tag is addressed using index=0, the tag below, using index=1 etc.

6.3.2.3 Converting a three-dimensional GUD array for linear access

The following diagram shows you the linearization of a three-dimensional array. You can find the linearized numbering to a three-dimensional array at the left in the corresponding table cell of the table to the right, e.g. (2,1,1) = (22).

The linearization of a two-dimensional GUD array is also included in it: One page of a three-dimensional array corresponds to one page of a two-dimensional array, whereby the side index is eliminated, e.g. (0,**1,2**) = (**1,2**).

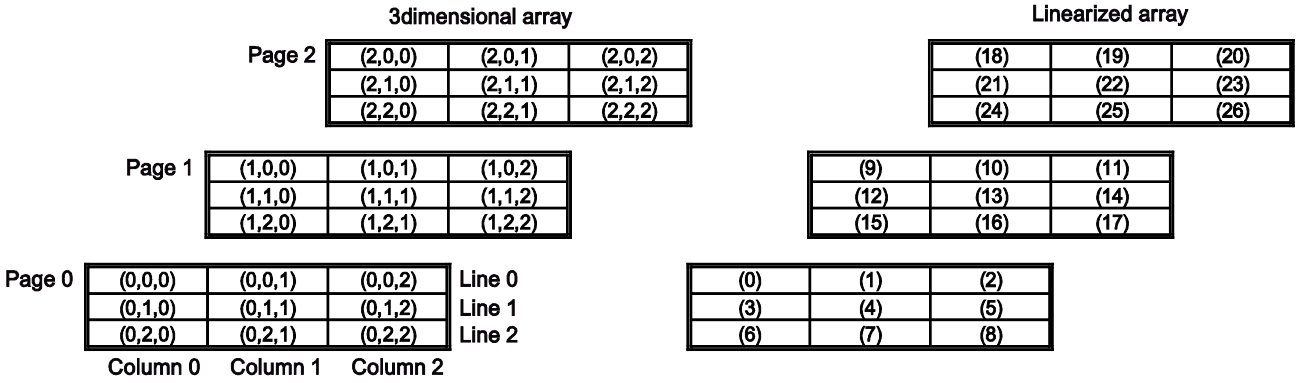


Figure 6-4 Linearization of three dimensional arrays

Information about the conversion

- Access, three-dimensional array:
  Array[page;line;column]
- Conversion to linearized numbering:
  Array index linear = (number of lines*number of columns) * page index + number of columns * line index + column index
- Access linearized array:
  Array[Arrayindexlinear]

In the prevailing 3x3x3 array, the following applies for the conversion:

Number of lines = 3

Number of columns = 3

The indices can only have the values 0, 1 or 2:

Permissible values, page index are: {0|1|2}

Permissible values, line index are: {0|1|2}

Permissible values, column index are: {0|1|2}

6.3.2.4 Accessing GUD arrays using an index tag

In the "HMI tags" editor, if you insert a new tag as GUD array, then as a default setting, the array length (parameter "Field number") is entered to permanently access an individual array element (e.g. Field number=9).

In order to be able to dynamically access individual elements of the GUD array using an index tag that you have created yourself, you must make the following settings in the Address column in the editor:

- "Field number" parameter: Change the default value here to "1", so that you can configure the "Line" parameter with an index tag.
- "Line" parameter: Select the previously created index tag (from the diagram,"Idx").

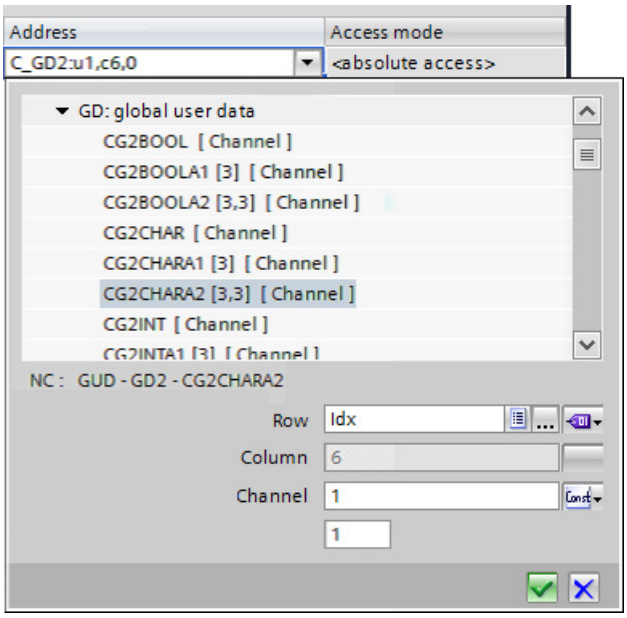


Figure 6-5 Parameters completed as example when using index tags for addressing

6.3.3 Importing GUD tags

6.3.3.1 Overview

The user data (GUD) is made available to WinCC on the configuration PC in the following way: the user data is packed in a user database using the supplied "WinCC import NC userdata" GUD tool and then stored with the corresponding TIA Portal project.

Note

Data consistency between the TIA Portal and SINUMERIK Operate

If you change something in the data in SINUMERIK Operate after the import into the TIA portal, these changes are not automatically synchronized between the systems.

Repeat the import process, therefore, if you change something in the GUD data in SINUMERIK Operate.

Note

GUD tags not compatible with libraries

GUD tags are not compatible with libraries and are not stored in a library when you copy a configuration.

Procedure overview

To use GUD in the TIA Portal, proceed as follows:

Step	Description
1	Provide the NC data as DEF files. To do this, you have the following options: • Using SINUMERIK Operate, export any existing DEF files from the NCU and copy them to the configuration PC. See Copying GUD to the configuration PC (Page 74). • Create new DEF files directly on the configuration PC.
2	Create a GUD database using the GUD TOOL "WinCC import NC userdata". See Creating a user database for global user data (Page 75).
3	The symbolic name is not included in the project when GUD tags are imported. Open the "HMI Tags" editor and enter the tag names of the imported GUD tags.

Result

The GUD tags have been imported, and can be selected in the "Address" field of the NC connection in the "HMI Tags" editor.

If you have specified the tag name in the "HMI Tags" editor, you can address the tags using their symbolic names.

To modify the GUD later, you need to create a new user database. See also: Subsequently changing definition files (Page 77).

6.3.3.2 Copying GUD to the configuration PC

The following describes the basic procedure for copying the DEF files from the NCU.

Requirement

- In SINUMERIK Operate, the USB port is enabled under "Commissioning > HMI > Log.Drive."
- A USB flash drive is plugged in.

Procedure

To make the GUD on the NCU available to the TIA Portal, proceed as follows:

1. Select the "Definitions" directory from the SINUMERIK Operate user interface in the operating area "Commissioning > System data > NC data", and press the "Copy" softkey.

   The "Definitions" directory is copied to the clipboard with all DEF files.

2. Select the USB flash drive in the folder structure, then press the "Paste" softkey.

   The "Definitions" directory is copied to the USB flash drive.

6.3.3.3 Creating a user database for global user data

Requirement

- The current DEF files from the NCU are available on the PG/PC.
- The TIA Portal project in which the GUD tags are to be used has been created but it is closed.

Procedure

To make the DEF files of the NCU available to the TIA Portal project and to create a user database, follow these steps:

1. On the PG/PC, select "Programs > Siemens Automation > SINUMERIK > GUD Tool" in the Windows Start menu.

   "WinCC import NC userdata" GUD tool starts.

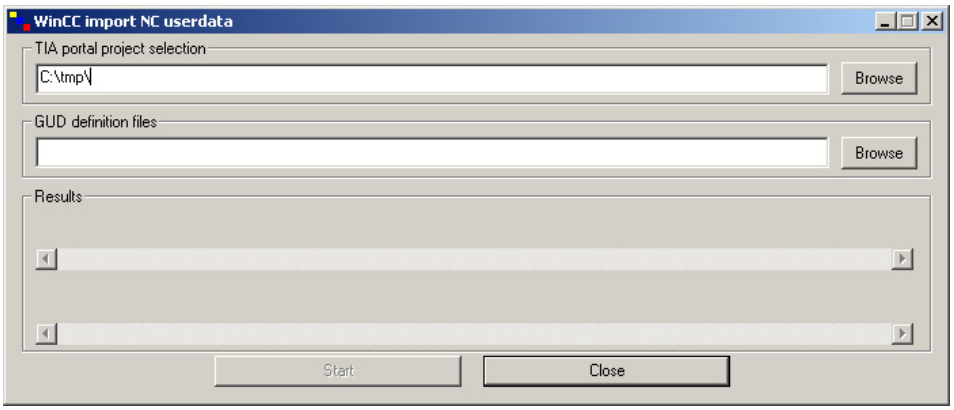


Figure 6-6 "WinCC import NC userdata" GUD tool

2. In the "TIA Portal project selection" input box, select the project (*.ap* file) in which the generated user database and the GUD user definition files should be saved.
3. In the "GUD definition files" input box, select the directory that contains the GUD user definition files. For example, this could be a USB flash drive with the copied DEF files (MGUD.DEF, UGUD.DEF, GUD4.DEF, GUD5.DEF, etc.) of the NC.
4. Click "Start".

Result

The files are copied to the project and a user database is created.

- The `Userdata.mdb` file is created in the `<project>\IM\HMI\Sinumerik\Databases` directory.
- The GUD user definition files are copied into the `<project>\IM\HMI\Sinumerik\Userdata` directory.

In the HMI Tags editor, the GUD tags are available in the selection dialog of the "Address" column under "GUD: dynamic user data".

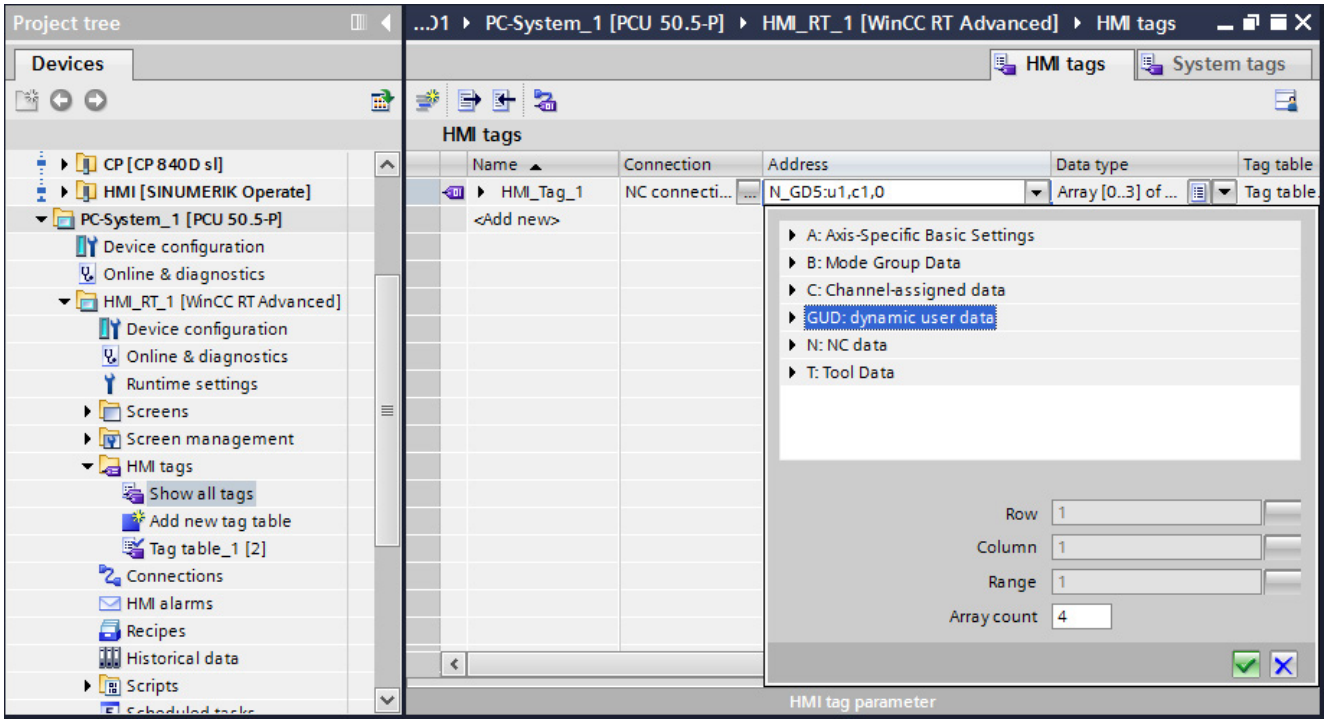


Figure 6-7 Selection of GUD tags

6.3.4 Subsequently changing definition files

If definition files are changed, the database must be re-created using the "WinCC import NC userdata" GUD tool.

If a new data item must be included in a definition file, then we recommend that this data item is attached to the end of the file. The addressing of the previous data item therefore remains unchanged. The already existing HMI tags remain correctly addressed.

If a data item must be inserted in existing GUD, this changes the addressing of the subsequent data. As a consequence, the runtime would access incorrect data. To prevent this, already configured HMI tags must be configured to the data "shifted" into the definition file using the variable editor.

If existing data is changed, after updating the database, the modified data must be opened in the WinCC variable editor using the "WinCC import NC userdata" GUD tool and possibly corrected.

Check the usage of the modified variables (e.g. data type) in the I/O field.

6.3.5 Copying GUD to NCU

If you have expanded the GUD tags offline in the TIA Portal, you must copy the changed DEF files with SINUMERIK Operate back to the NCU.

The DEF files of the GUD database used in the TIA Portal must match the DEF files in the NC so that the WinCC RT Advanced Runtime can correctly access the GUD tags.

Procedure

To copy the GUD from the configuration PC to the NCU, proceed as follows:

1. On the configuration PC, copy the DEF files from the project folder to a USB flash drive. The DEF files are located in the following directory: \<Project folder>\IM\HMI\Sinumerik\Userdata\
2. In the SINUMERIK Operate user interface, in the operating area "Commissioning > System data > NC data", copy the files from the USB flash drive into the "Definitions" directory.
3. Activate the files using "Define and activate user files (GUD)".

6.4 Configuring a tag for address multiplexing

Introduction

Using address multiplexing, you can use a single variable to access a multitude of memory locations within the PLC's address range. You read and write to the addresses without defining a variable for each individual address. This efficient method allows you to process a large amount of data.

Example of a procedure using R parameters as a basis

1. Create a local "index" variable.
2. Create a variable with a connection to a control, and in area C and in the RP block, select the R parameter variable.
3. You can make a selection from the operator control to the right next to the input for the parameter number.
4. Select HMI_variable followed by the "index" variable.

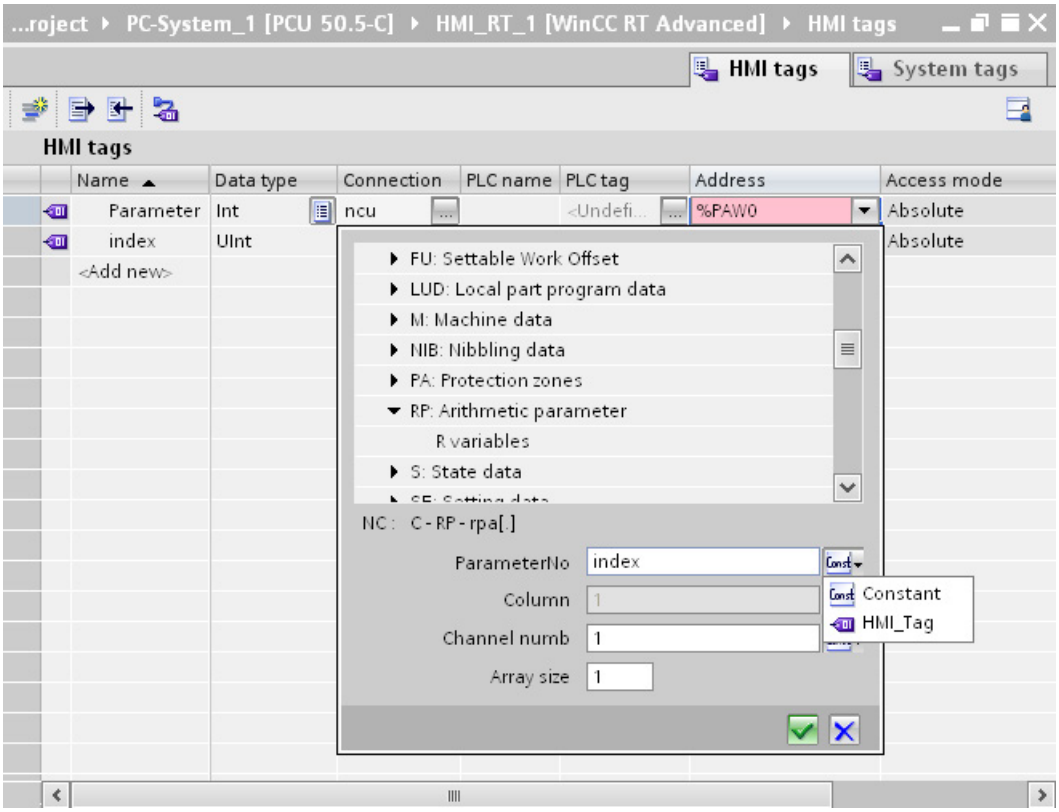


Figure 6-8 Address multiplexing

Result

By changing the "index" variable during the runtime, another R parameter is accessed.

Configuring alarms 7

7.1 Overview

Introduction

You can view both HMI alarms as well as SINUMERIK-specific alarms in the WinCC control "Alarm view" at runtime:

- **NC alarms**
  - To display NC alarms in the alarm view, you must configure the settings (Page 80).
  - You can customize the displayed alarm texts directly on the configuration PC (Page 82).
- **DB2 alarms from the PLC (alarm numbers 500000 to 799999)**
  - You can import DB2 alarms from the NCU (Page 84).
- **SIMATIC PLC alarms**
  - HMI alarms defined in WinCC are displayed in the alarm view in each case. You can find information on configuration in the information system of the TIA Portal, section "Visualizing processes > Working with alarms > Configuring alarms".

Additional information

This section describes what you need to consider when configuring the SINUMERIK-specific alarms / messages.

You can find general information on configuring alarms / messages in WinCC in the information system of the TIA Portal, section "Visualizing processes > Working with alarms".

7.2 Configuring NC alarms

7.2.1 Settings for display of NC alarms

Requirements

To display NC alarms in the alarm view at runtime, the following requirements must be met:

- A connection to the NC is configured.
  See Configuring a non-integrated connection (Page 57).
- The SINUMERIK alarm classes are activated.
  These settings can be found in the project tree in the runtime settings under "Alarms".
  The following settings for the connection to the NC must be made in the PLC alarms table:
  - NC alarms: Texts and figures
  - NC events: Activated

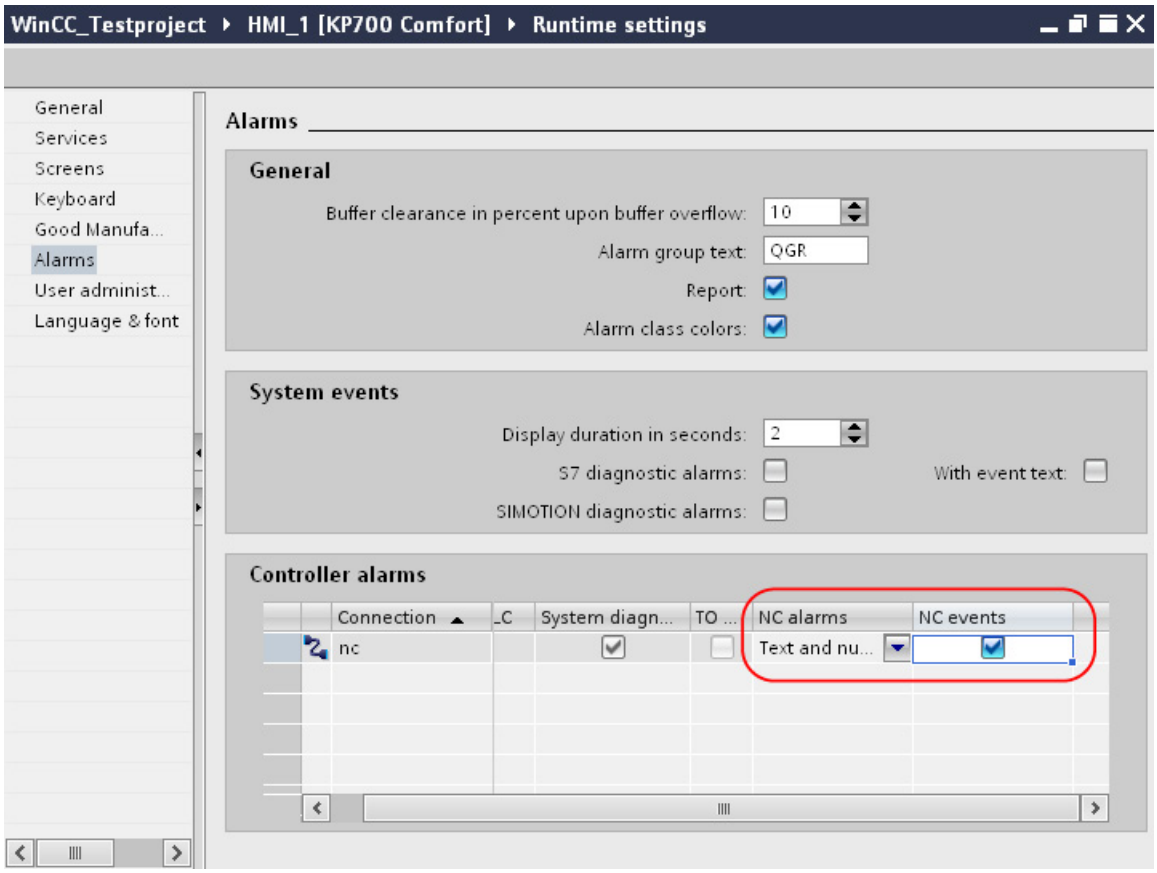


Figure 7-1 Settings for PLC alarms of the connection (the name of the connection is "nc" in the screen)

- The SINUMERIK alarm classes "NC alarms" and "NC events" are activated in the properties of the "Alarm view" control.

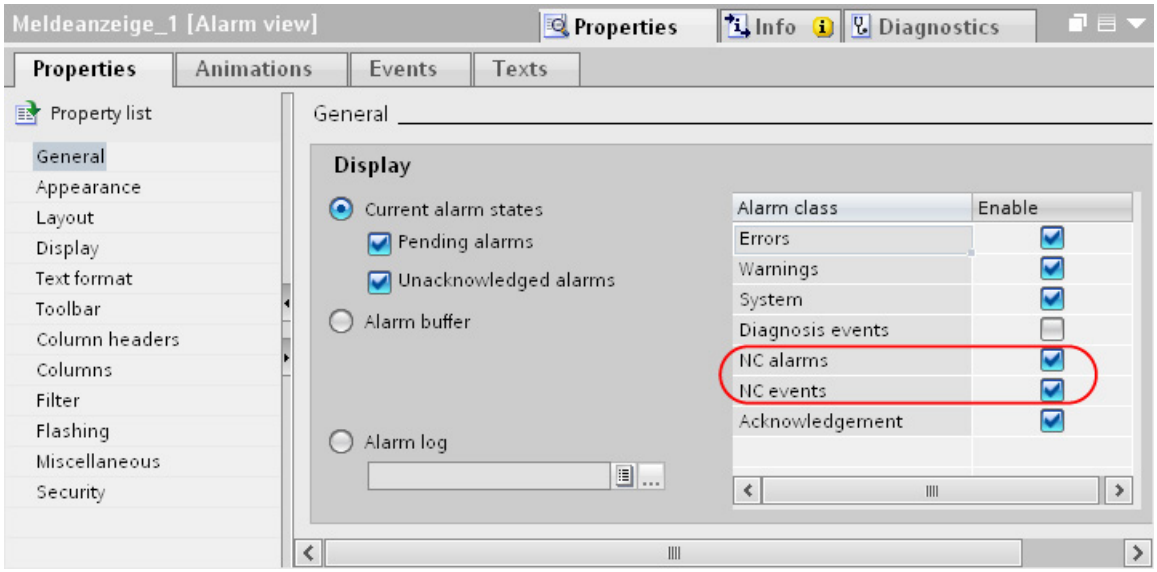


Figure 7-2 Alarm classes in the properties of the "Alarm view" control

7.2.2 Changing NC alarm texts

The NC alarm texts are stored on the configuration PC during installation of SINUMERIK Integrate Create MyHMI /WinCC. Here, the familiar weighting concept of SINUMERIK is used with the Siemens, OEM and User folders.

When you adapt the alarm text, read the information about file storage, the weighting concept and character set in this section.

Storing

NC alarm templates are saved in the following directory on the configuration PC during installation of the TIA Portal:

- <Installation directory of the TIA Portal>\Data\Hmi\Sinumerik\Alarmtexts
- For example:
  C:\Program Files (x86)\Siemens\Automation\Portal V13\Data\Hmi\Sinumerik\Alarmtexts\

Note

Using original files for the NC alarm text only as template

To avoid losing the original files of the NC alarm texts, copy them to the user directory before you change them.

The SINUMERIK alarm texts stored in the installation directory serve as template.

If you only want to modify texts, copy the corresponding alarm directory to the directory of the relevant TIA Portal project:

- <Project directory>\IM\HMI\Sinumerik\Alarmtexts
- For example:
  C:\Users\Admin\Documents\Automation\My_Project\IM\HMI\Sinumerik\Alarmtexts

At this point in the project, alarm texts can now be changed.

We recommend that the original texts are kept in the "Siemens" directory and changes are only made in a copy located in the "OEM" or "User" directories.

Weighting concept

The alarm texts are read line-by-line in the following order:

1. Siemens
2. OEM
3. User

Which means a changed alarm text in the OEM directory overrides the alarm text in the Siemens directory.

A changed alarm text in the User directory in turn overrides the alarm text in the OEM or Siemens directories.

Character set and encoding

When you adapt the alarm texts, pay attention to the character set used (e.g. ANSI) and the encoding. Do not use any characters or any text editors which are not compatible with the character set or encoding.

The respective alarm text file indicates the character set used.

ANSI in conjunction with GB2312 (Chinese simplified) encoding is used for Chinese alarm texts.

7.3 Configuring DB2 alarms

7.3.1 Overview

The PLC alarms in the number range 500000 to 799999 are be configured via program blocks of the PLC basic program:

- A bit is set or deleted in the ALMSG_DB [DB2] program block.
- The program block AL_MSG[FC10] checks the program block [ALMSG_DB2] for this bit.
- An alarm is displayed or not displayed depending on this bit in the program block ALMSG_DB [DB2].

The alarms are referred to as DB2 alarms, for example, from SIMATIC PLC alarms.
See also: Configuring alarms (Page 79)

In the basic program, cyclically call the AL_MSG [FC10] program block, which checks program block ALMSG_DB [DB2] for coming and going alarms.

In SINUMERIK Operate you can assign these alarms language-dependent alarm texts.

You can import these DB2 alarm texts into the TIA Portal.

Note

Data consistency between the TIA Portal and SINUMERIK Operate

If you change something in the data in SINUMERIK Operate after the import, these changes are not automatically synchronized between the systems.

Repeat the import process, therefore, if you change something in the data in SINUMERIK Operate.

Note

DB2 alarms not compatible with libraries

DB2 tags are not compatible with libraries and are not stored in a library when you copy a configuration.

Additional information

Information about "FC 10: AL_MSG errors and operating messages" are listed in the SINUMERIK 840D sl/828D Basic Functions Function Manual in Chapter "P3: PLC basic program for SINUMERIK 840D sl".

Precondition

- The SINUMERIK 840D sl TIA Portal Toolbox is installed.

  (Required to configure a SINUMERIK NCU)
- An NCU has been added.
- A PC system with WinCC RT Advanced or a SIMATIC Panel has been added.
  See Inserting PC system and Runtime (Page 42) or Adding a SIMATIC Panel (Page 49)
- A connection to the PLC is configured.
  See Configuring connections (Page 53)
- SINUMERIK Integrate Access MyMachine /P2P is installed.

  See Overview of TOOLS supplied (Page 15)

Procedure overview

To read DB2 alarms from the PCU 50.5 (or NCU) and import them into the TIA Portal, follow these steps:

Step	Description
1	Make the DB2 alarms available as TS files in the corresponding language. The following options are available: • If you have installed SINUMERIK Integrate Access MyMachine /P2P on a PG/PC, using SINUMERIK Operate copy the TS files to a USB flash drive (Page 88). • If you have installed SINUMERIK Operate and SINUMERIK Integrate Access MyMachine /P2P on the same PC system, then you will find the TS files in the following directory: C:\Program Files (x86)\Siemens\MotionControl\oem\Sinumerik\hmi\lng\ • You can learn how to export the files and simultaneously convert them with an online connection in the online help for SINUMERIK Integrate Access MyMachine /P2P in the section "Exporting a file".
2	Convert DB2 alarms using SINUMERIK Integrate Access MyMachine /P2P into the CSV format (Page 89).
3	Check that all languages in which you want to import DB2 alarms are enabled as project languages in the TIA Portal. • To learn which exported CSV files correspond to specific project languages in the TIA Portal, refer to the section Language assignment in language-dependent texts (Page 122). • How to enable the project languages is described in the section Enable project languages (Page 118).
4	Import the CSV files into the TIA Portal (Page 92).

Result

The imported DB2 alarms appear in two different editors in the TIA Portal:

- Below the WinCC RT Advanced or the SIMATIC panel in the "HMI messages" editor, "Controller alarms" tab.
- Below the PLC in the "PLC messages" editor.

You can now configure the "Alarm view" control in the screen. In order that the imported alarms are displayed during the runtime, adapt the settings to display DB2 alarms (Page 86).

7.3.2 Settings for displaying DB2 alarms

Preconditions

To display DB2 alarms in the alarm view at runtime, the following requirements must be met:

- A connection has been configured to the PLC.
  See Configuring connections (Page 53).
- System messages are activated.
  These settings can be found in the project tree in the runtime settings under "Messages".
  The following option boxes must be activated in the "System messages" section:
  - S7 diagnostic messages (number)
  - Display message text

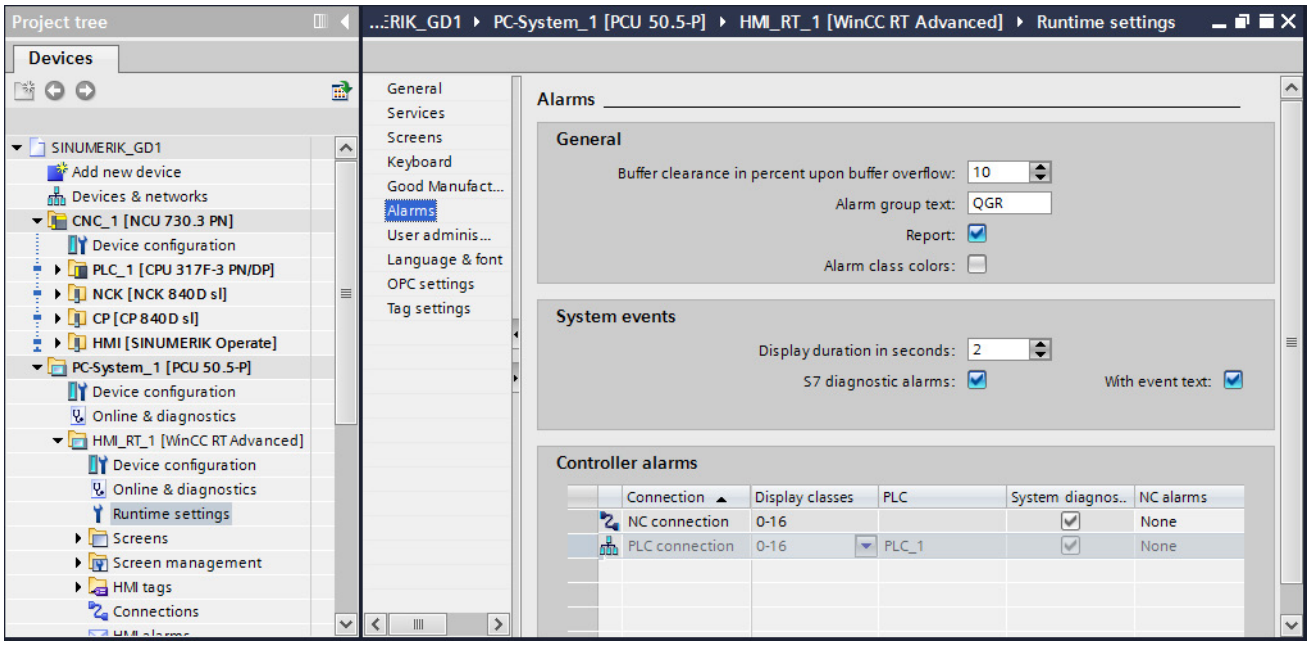


Figure 7-3 Settings to display DB2 alarms

- In the properties of the control "Alarm view" in the option box "Message buffer", the message classes are activated.

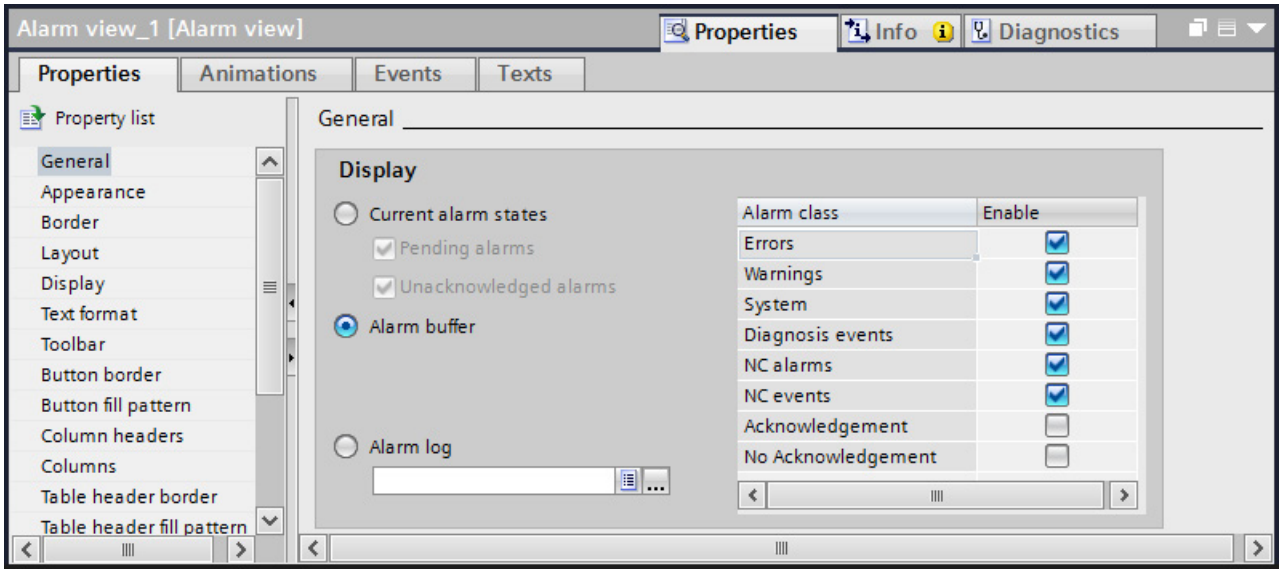


Figure 7-4 Message classes in the properties of the control "Alarm view" under "Message buffer"

7.3.3 Exporting DB2 alarms (TS files)

This chapter describes how you export the DB2 alarms using the user interface of SINUMERIK Operate.

Alternatively, you can also copy DB2 alarms in a different way; you can also export these in one step and convert them using SINUMERIK Integrate Access MyMachine /P2P if an online connection exists.

- When installing SINUMERIK Operate on a PC system, DB2 alarms are saved on a PC system in the TS format at the following memory location:

  C:\Program Files (x86)\Siemens\MotionControl\oem\Sinumerik\hmi\lng\

- You can learn how to export the files and simultaneously convert them with an online connection in the online help for SINUMERIK Integrate Access MyMachine /P2P in the section "Exporting a file".

Precondition

- A USB flash drive is inserted at a PC system with SINUMERIK Operate.
- In SINUMERIK Operate, the USB port is activated under "Commissioning > HMI > Log. Drive."

Procedure

To copy TS files from SINUMERIK Operate, and to convert them into the CSV format using SINUMERIK Integrate Access MyMachine /P2P, proceed as follows:

1. In SINUMERIK Operate select the screen "Commissioning > System data" – and in the folder structure, navigate in the "HMI data/Texts/Manufacturer/" directory.
2. Select the required TS files and actuate the "Copy" softkey".
3. Select the directory structure of your USB flash drive and press the "Paste" softkey.

Result

The DB2 alarms were copied from SINUMERIK Operate as TS files.

7.3.4 Converting DB2 alarms into the CSV format

Precondition

- The USB flash drive with copied TS files is inserted and/or the TS files are available elsewhere.
- SINUMERIK Integrate Access MyMachine /P2P is installed
  See Overview of TOOLS supplied (Page 15)

Procedure

To copy TS files from SINUMERIK Operate, and to convert them into the CSV format using SINUMERIK Integrate Access MyMachine /P2P, proceed as follows:

1. Start Access MyMachine /P2P, e.g. using the entry in the start menu:
   "Start > All programs > SINUMERIK > Tools > Access MyMachine P2P (PC)"
   SINUMERIK Integrate Access MyMachine /P2P is opened.

   Note

   Settings to be made when starting for the first time

   If you are starting the tool for the first time, you must assign a password and when necessary, make connection settings.

   Additional information on this is provided in the online help for Access MyMachine /P2P.

2. Click in the menu "File" on "New > Project...", enter the project properties and confirm with "Save".

3. Click in the "Project" area on "Add...".

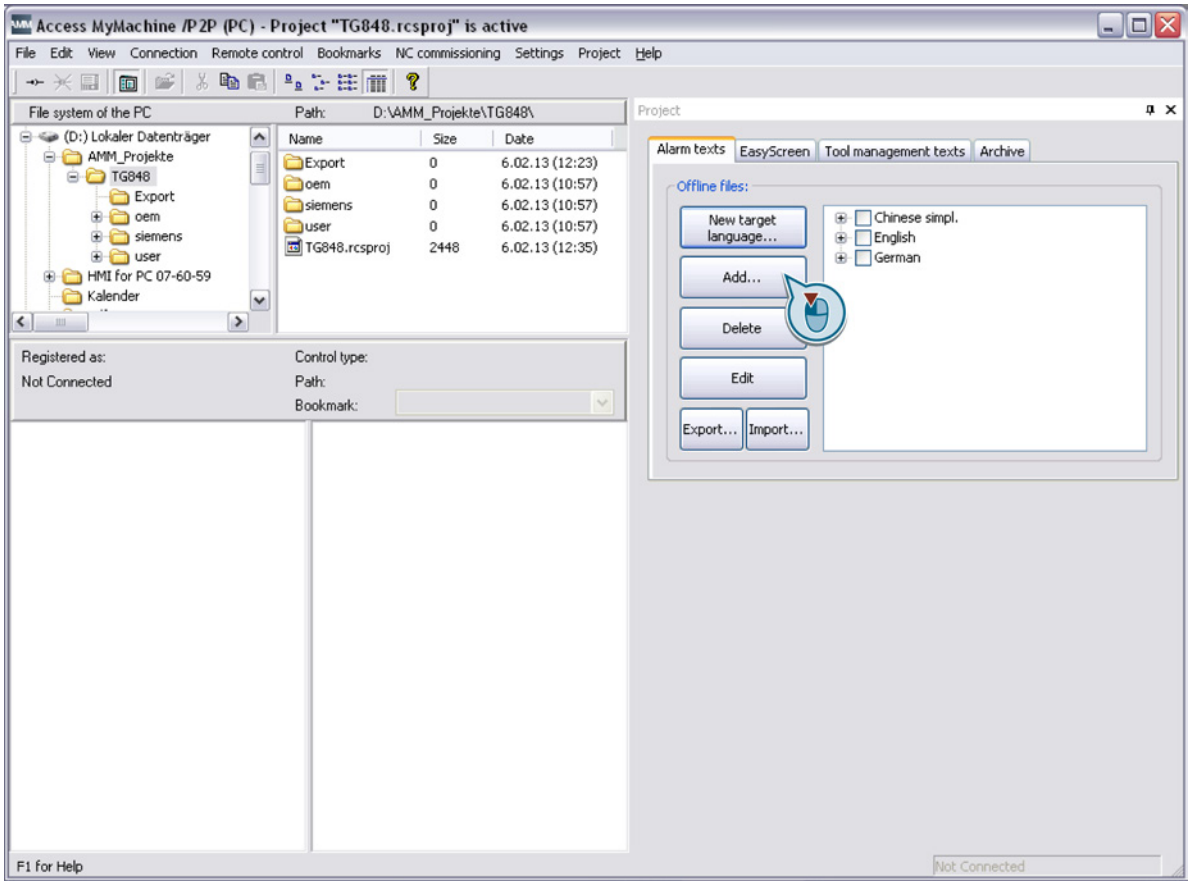


Figure 7-5 SINUMERIK Integrate Access MyMachine /P2P

4. In the "Open" dialog, navigate to the USB flash drive with the copied TS files, select them and click "Open."
   The TS files are displayed in the "Project" area in the tree structure below the associated language.

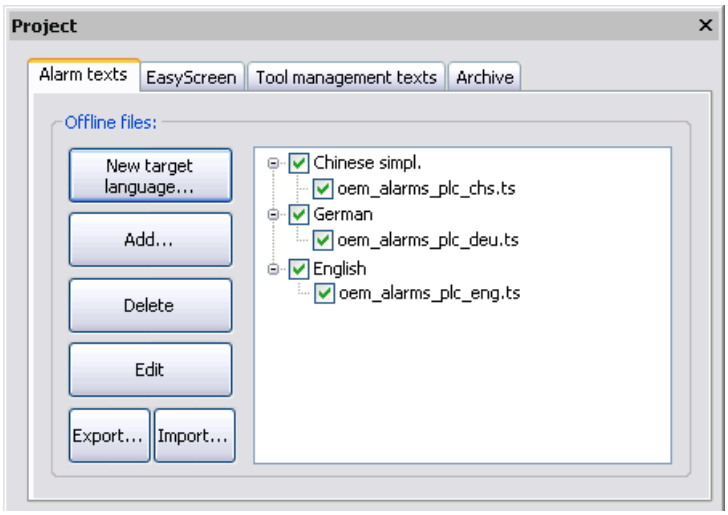


Figure 7-6 Project area with added TS files

5. Select the check box for the TS files you want to use in the TIA Portal, click "Export" and select a folder where the CSV files are to be stored.

Result

The DB2 alarms were converted using Access MyMachine /P2P into the CSV format.

You can import (Page 92) these CSV files into the TIA Portal.

7.3.5 Importing DB2 alarms

Precondition

- The SINUMERIK 840D sl TIA Portal Toolbox is installed.

  (Required to configure a SINUMERIK NCU)
- An NCU has been added.
- A PC system with WinCC RT Advanced or a SIMATIC Panel has been added.
  See Inserting PC system and Runtime (Page 42) or Adding a SIMATIC Panel (Page 49)
- An integrated connection to the PLC has been created.
  See Configuring connections (Page 53)
- The DB2 alarm texts of the corresponding language are available in CSV format.
  See Overview of TOOLS supplied (Page 15)
- The languages in which the CSV file are available are activated as the project language.
  See Language assignment in language-dependent texts (Page 122) and Enable project languages (Page 118)

Procedure

To import DB2 alarm texts in the CSV format into the TIA Portal, follow these steps:

1. In the project tree, right-click on the integrated PLC or NCU, then, select "Import DB2 alarms" in the shortcut menu.

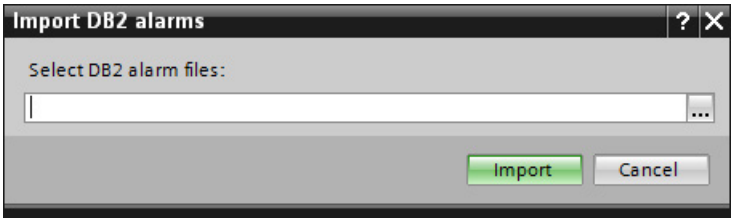


Figure 7-7 Importing DB2 alarms

2. Click on button "...", change into the directory with the CSV files and select all of the required files, e.g. using the mouse.

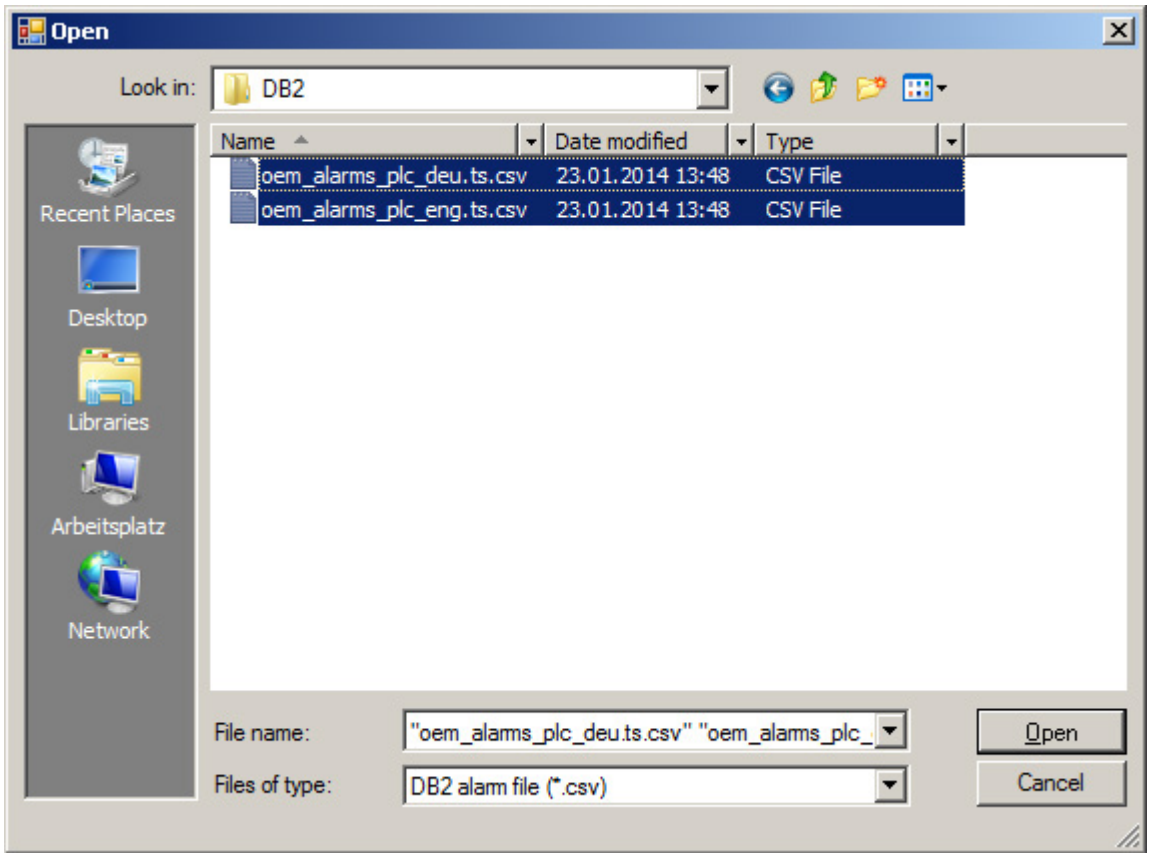


Figure 7-8 Opening DB2 alarms

3. Confirm the selection with "Open".
   In the "Import DB2 alarms" dialog, the selected files are displayed, separated by a comma.

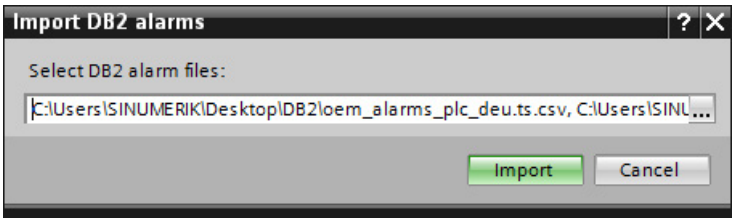


Figure 7-9 "Import DB2 alarms" dialog with two selected CSV files

4. Click on the "Import" button.

Result

The DB2 alarms have been imported and are displayed in the TIA Portal in two different editors:

- Below the PLC in the "PLC messages" editor.
- Below the WinCC RT Advanced or the SIMATIC panel in the "HMI messages" editor, "Controller alarms" tab.

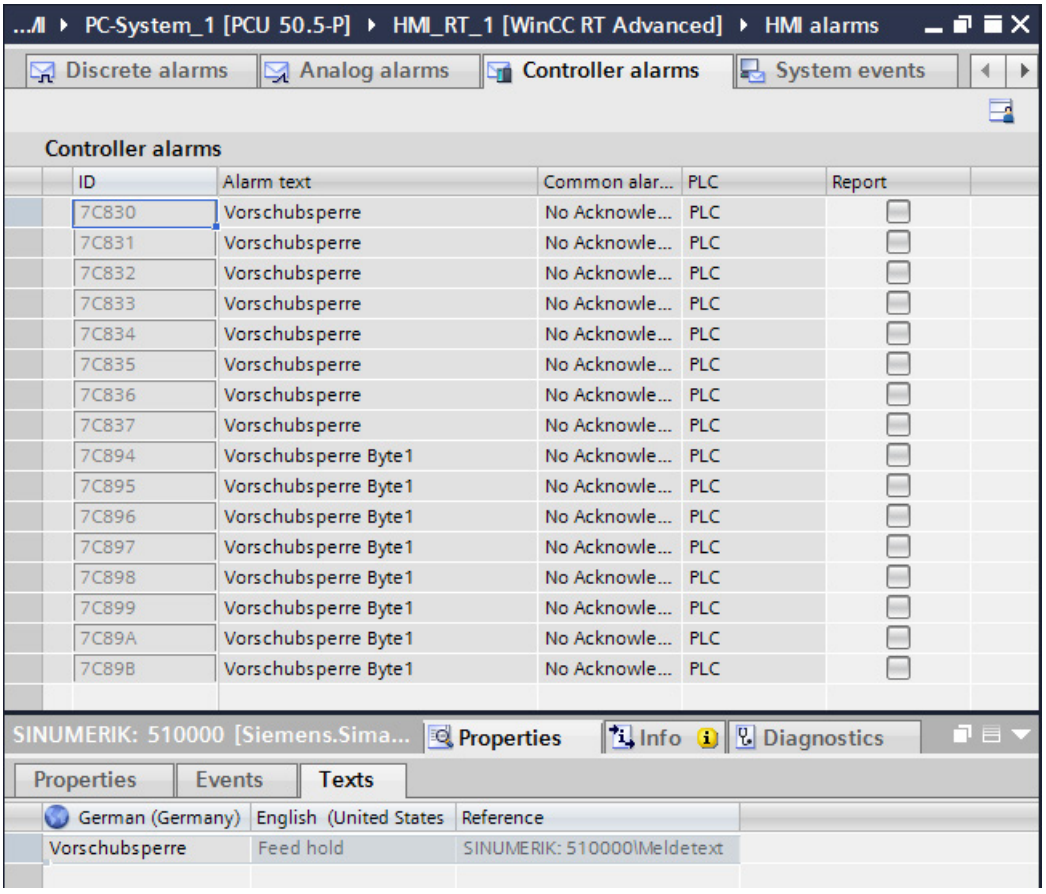


Figure 7-10 Imported DB2 alarms in the HMI messages editor

You can now configure the "Alarm view" control in the screen. In order that the imported alarms are displayed during the runtime, adapt the settings to display DB2 alarms (Page 86).

See also

SINUMERIK Integrate Access MyMachine /P2P in the SIEMENS Industry Mall (https://ebstage.automation.siemens.com/mall/en/us/Catalog/Products/10166235)

Configuring screen objects

8

8.1 Overview

Overview

Once you have planned and implemented the structure and number of screens in your configuration, you can add screen objects in the required screens.

In addition to the standard range of screen objects in SIMATIC WinCC Advanced, you can configure the "NC program part" control:

- Configuration and operation (Page 98)
- Properties (Page 100)
- Change via script (Page 102)

Additional information

You can find information about the standard range of screen objects of SIMATIC WinCC Advanced in the information system of the TIA Portal:

- section "Visualizing processes > Working with Objects".

8.2 "NC part program" display object

Introduction

The "NC part program" display object allows you at runtime to display and select part programs, subprograms or workpieces as overview.

The display object can be found in the Task Card "Tools" below "Controls".

Configuration options

To make the part program overview functionally complete, you can configure function keys or configured command buttons with NC part program functions (e.g. navigating and selecting in the list directory).

You can specify the properties of the display objects during the configuring, e.g. what font it should have. See also: Properties of the "NC part program" display object (Page 100)

Operation of the "NC part program" display object at runtime

The following figure shows the "NC part program" display object during configuration.

Figure 8-1 "NC part program" display object

During the runtime, command buttons can be used to:

Table 8- 1 Command buttons for the display object

Element	Function
Current path name	The path of the opened directory is displayed, e.g. MPF, SPF.
List box below "Current path name"	Part program names and directories are displayed line-by-line in the list. Select in the list box the directory to be opened or the required program.
	Navigating and selecting in the list directory
	Update directories in the list box
	Select the selected part program / workpiece on the NC for editing.
Selected channel	Enter the NC channel as integer in the "Selected channel" text box.

Click or touch a directory name to change to the selected directory. The new path name is displayed below the "Current path name" and the subdirectories are displayed in the list box.

8.3 Properties of the "NC part program" display object

Introduction

You have several ways of configuring the "NC part program" display object in the "Screens" editor. These selection options are available for a selected display object in the Inspector window below Properties.

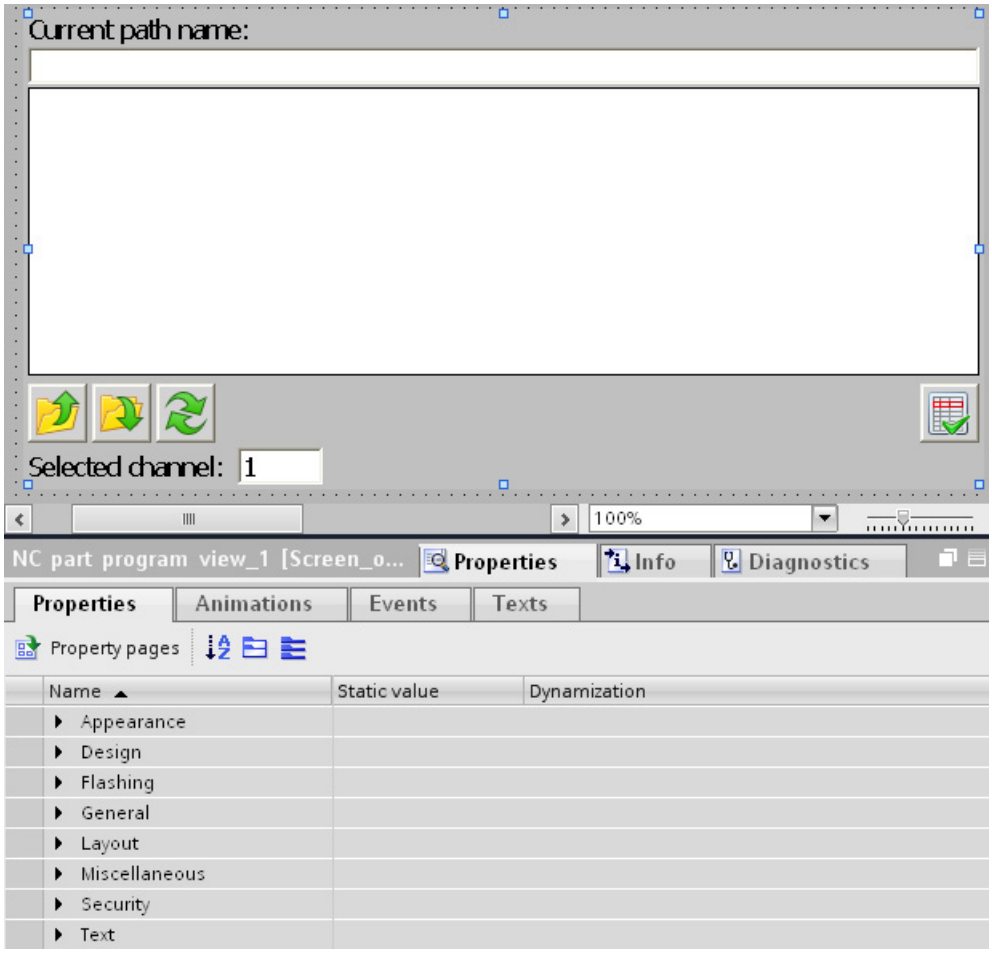


Figure 8-2 Properties of the "NC part program" display object

General properties

Under "General", you can make the following settings for part program selection:

Property	Description
Connection > Name	Select the NC control using its symbolic name.
Path > Name	Select a predefined path name (max. 29 characters, in uppercase letters). For example, WKS_DIR, MPF_DIR, SPF_DIR, CST_DIR, CUS_DIR or CMA_DIR.
Path > Variable	Select the connected path variable.
Channel > Name	Select one of the predefined channels (1 - 10).
Channel > Variable	Select the connected channel variable.
Channel > Editable Path > Editable	You can enable/disable editing of the paths or channels by selecting the "Editable" field.

Additional properties

You can customize the complete representation of the "NC part program" display object using Design, Layout, Representation, Text, Flashing and Miscellaneous.

Further information concerning the properties of WinCC display objects

Information concerning the properties for WinCC display objects can be found in the information system of the TIA portal. This contains not only detailed descriptions, but also Tooltips directly for the individual properties.

"Layout" property

You can select which buttons, etc. should be displayed in the display object under "Layout".

Events

In order to also be able to operate the "NC part program" externally or, depending on the functionality, to allocate an appropriate authorization, command buttons can be hidden in the display object during the configuration. The required functionality can be triggered via softkeys with various authorization levels.

If you have selected the "NC part program" display object, you can configure functions for Events in the Inspector window using "Properties > Events".

Table 8- 2 Events for the "NC part program" display object

Event	Meaning
Enable	On selection, the display object is activated.
Deactivation	On deselection, the display object is deactivated.

Further information

Information about the configurable functions of the "NC part program" display object are contained in Section Configuring PI services of the NC as system functions (Page 103).

8.4 Changing the display object using a script in WinCC

Changing the display object using a script in WinCC

You can also modify display object properties at runtime in WinCC using scripts. This provides a means, for example, of changing the colors or the part program path dynamically.

Script example

```
Dim view

Set view = HmiRuntime.Screens("Screen_1").ScreenItems("NC Part Program_1")

view.Channel=1

view.BackColor=RGB(0, 255, 0)

view.GridlineColor=RGB(0, 0, 255)

view.Path="MPF_DIR"
```

Configuring PI services of the NC as system functions

9

9.1 Overview

Purpose

In WinCC, you can link events (e.g. "Key pressed") with predefined functions. If an event should occur during operation, the function triggers a certain action on the HMI device or in the control.

Principle

In general, you can use the functions for the following:

- Establish the configuration on a process-for-process basis (e.g. branch from one screen to another).
- Control the process (e.g. set control parameters).
- Carry out the system settings online at the HMI device (e.g. changing interface parameters).

As a rule, functions and events are linked to a certain object. For example, a function with event "Press key" is not triggered by every key, but only by one specific key.

Objects, which can be linked to functions, include:

- Function keys and command buttons
- Fields
- Screens
- Tags

The number of functions offered is, therefore, dependent on the HMI device and on the situation.

SINUMERIK functions

In addition to the functions available in WinCC, SINUMERIK-specific functions (PI services) are provided to support configuration with SINUMERIK Integrate Create MyHMI /WinCC.

These are the following functions:

- Functions for the "NC part program" display object (Page 105)
- Function for the current block display (Page 107)
- Function to start and stop the PLC (Page 109)

Further information

Information about general functions for WinCC can be found in the information system of the TIA portal. This contains not only detailed descriptions, but also Tooltips directly for the individual functions.

9.2 Functions for the "NC part program" display object

Introduction

In order to also be able to operate the "NC part program" externally or, depending on the functionality, to allocate an appropriate authorization, command buttons can be hidden in the display object during the configuration. The required functionality can be triggered via softkeys with various authorization levels.

Procedure

To add a new function, proceed as follows:

1. Open the editor for screens.
2. Select the "NC part program" display object.
3. In the inspector window, switch to "Properties > Events".
4. To add a new function, select it from the "<Add function>" dropdown list in the "keyboard operation for display objects" directory.

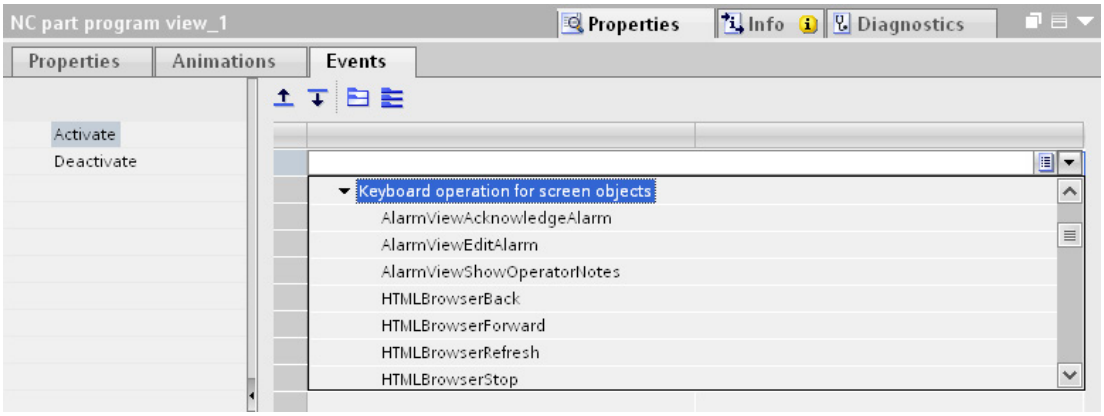


Figure 9-1 "Keyboard operation for display objects" functions

Functions available for the "NC part program" display object

The following functions influence the "NC part program" display object:

Table 9- 1 Functions for the NC part program display object

Function	Meaning
ScreenObjectCursorDown	Performs the <down> key function on the the specified display object.
ScreenObjectCursorUp	Performs the <up> key function on the the specified display object.
ScreenObjectPageDown	Performs the <page down> key function on the the specified display object.
ScreenObjectPageUp	Performs the <page up> key function on the the specified display object.
PartProgramListDirDown	Navigate and select in the list directory.
PartProgramListDirUp	Navigate and select in the list directory.
PartProgramListRefresh	Update directories in the list box
PartProgramListSelectNCPartProgram	Open the selected part program for editing on the NC.

9.3 Function for the current block display

The PrepareActualNCBlockForDisplay function is used to monitor the execution of the traversing blocks of an NC traversing program on the HMI device. This function is used to save the current, previous and next traversing block of an NC part program currently being processed in a channel from the NC to local variables.

Procedure on the HMI device

- The PrepareActualNCBlockForDisplay function starts when a screen is opened.
- A non-configured NC tag block is activated with the configured cycle.
- On each cyclic reading operation of the NC tag block, the tag block is divided into three parts and stored in the local tags of the previous, current and subsequent set.
- The local variables can be displayed on the screen as outputs.

Procedure

1. Select the function in the screen editor for "Select screen" (the screen is selected) from "Events > Structured > Add function" in the "SINUMERIK" directory.

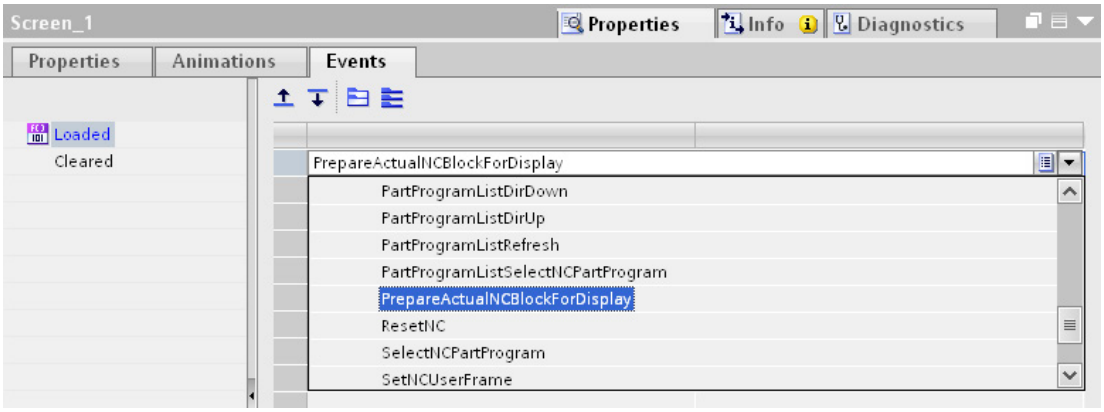


Figure 9-2 Current block display

2. Specify three local tags of type String of length 66.
3. Within a screen, create three output fields each with one of these tags.

4. Now configure the PrepareActualNCBlockForDisplay function as the open screen trigger.
5. Then specify the corresponding NC, the channel from which the current block is to be read, the cycle, and the three local string tags as parameters for this function.

Parameter	Meaning	Data type
Connection	Name of the NC. Can be viewed under: "PC-System_1 > HMI_RT_1 > Connections".	ASCII characters
Channel	Channel from which the program is to be read; 1 - max. 10	Constant or variable
Cycles (100 ms)	Update time as a multiple of 100 ms: 1 – 600 (equal to 100 milliseconds – 1 minute)	Constant
Previous block (output)	Local tag for the traversing block that precedes the current traversing block	String tag
Current block (output)	Local tag for the current traversing block	String tag
Next block (output)	Local tag for the traversing block that follows the current block	String tag

9.4 Function to start and stop the PLC

Introduction

This function changes the operating mode of an S7-CPU: RUN or STOP.

Procedure

1. Select the function in the screen editor with "Events > Add functions > Settings".

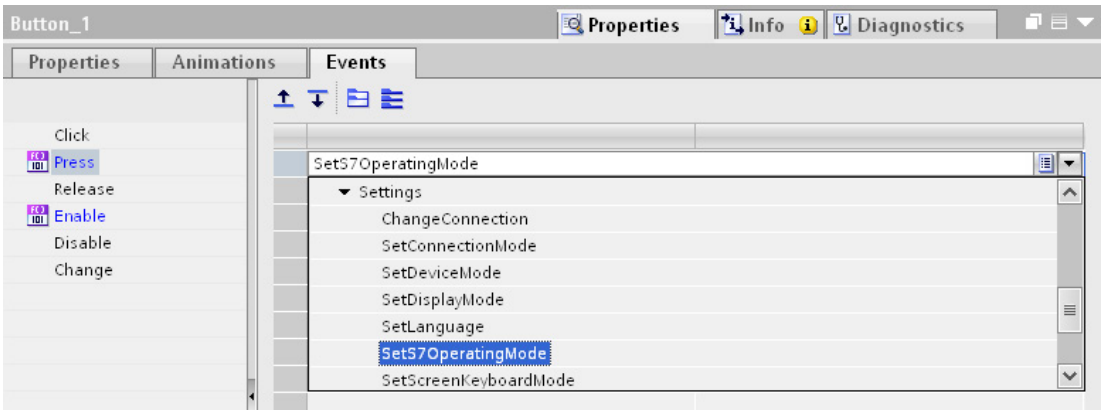


Figure 9-3 SetS7OperatingMode

2. Assign the SetS7OperatingMode function to a key of the screen.
3. Enter the required parameters:

Parameter	Meaning
Connection	Symbolic name of the S7-CPU, which you entered under the "Properties" of the control.
Operating mode	Operating mode of the S7 CPU (variable or constant): 0 = RUN 1 = STOP

9.5 Running NC functions from WinCC

9.5.1 Overview

Requirement

A connection to the NC is established.

See: Configuring a non-integrated connection (Page 57)

Procedure

To add a new function, proceed as follows:

1. Open the editor for screens.
2. In the Inspector window, switch to "Properties > Events".
3. To add a new function, select it from the "<Add function>" drop-down list in the "SINUMERIK" directory.

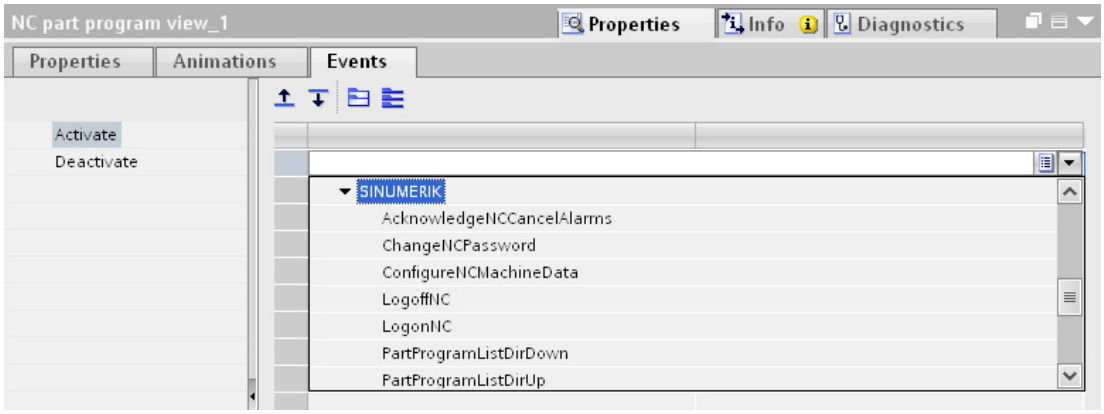


Figure 9-4 "SINUMERIK" functions

The following functions are available:

- LogoffNC (Page 111)
- ChangeNCPassword (Page 111)
- LogonNC (Page 112)
- ConfigureNCMachineData (Page 112)
- ResetNC (Page 112)
- AcknowledgeNCCancelAlarms (Page 113)
- SetNCUserFrame (Page 113)
- StartNCPIService (Page 114)
- SelectNCPartProgram (Page 115)

9.5.2 LogoffNC

Description

This function clears the NC password. Following this, the keylock switch acts.

The passwords for the HMI device and the NC are independent of one another.

Parameter	Meaning
Connection	Name of the connection to the NC.

9.5.3 ChangeNCPassword

Description

A password is passed to the NC for a password level. The existing password for this password level is overwritten.

The user must be logged on to the NC with a suitable access level (level).

Procedure on the HMI device

The currently valid NC password is overwritten by the new password.

Parameter	Meaning
Connection	Name of the connection to the NC.
Password	New PLC password (max. 8 characters) (constant or variable)
Level	NC password level (constant or variable): 0 = system 1 = manufacturer 2 = service 3 = user

9.5.4 LogonNC

Description

A password is passed on to the NC. The passwords for the HMI device and the NC are independent of one another.

Parameter	Meaning
Connection	Name of the connection to the NC.
Password	The password that authorizes the NC logon (variable or constant)

Procedure on the HMI device

After activating the function, the specified password is used to attempt to log on to the NC.

9.5.5 ConfigureNCMachineData

Description

This function is used to activate all machine data of NEW_CONF classification.
The CLASS parameter permits a more detailed classification. Currently, however, only value 1 is supported.

Parameter	Meaning
Connection	Name of the connection to the NC.
Class	Classification of the machine data being activated (variable or constant): 1 - 3

Procedure on the HMI device

A corresponding PI service is transferred to the NC from the currently valid parameters.

9.5.6 ResetNC

Description

This function triggers a restart at the NC.

Parameter	Meaning
Connection	Name of the connection to the NC.

9.5.7 AcknowledgeNCCancelAlarms

Description

This function is used to acknowledge all cancel alarms pending for the specified connection in a single action.

Parameter	Meaning
Connection	Name of the connection to the NC.

9.5.8 SetNCUserFrame

Description

The data for zero point offsets is activated for a channel.

On entry, these variables are initially stored in a temporary memory on the NC. The SetNCUserFrame function completely activates the newly-entered values and can be read subsequently.

With this PI service, only one zero offset can be activated. When several zero offsets are set, only the parameters of the zero offset last set can be activated.

Parameter	Meaning
Connection	Name of the connection to the NC.
Channel	Channel to be activated (constant or variable): 1 - max 10

Procedure on the HMI device

After the HMI device user has entered the data for the zero offsets into the HMI device and pressed the configured key, the zero offset data is activated for the specified channel.

9.5.9 StartNCPIService

Description

This function can be used to transfer any PI service to the NC. This must be described by a parameter string. This parameter string must include the full command and not merely the parameters of the PI service.

Parameter	Meaning
Connection	Name of the connection to the NC.
PI parameter string	Specification of the PI service to run (constant or variable)
Result (output)	When a function is activated, a return value is reported in this parameter asynchronously after termination.

Procedure on the HMI device

A corresponding PI service is transferred to the NC from the currently valid PI parameter string.

Example

NCK-Reset parameter string

```
StartNCPIService

("PI_START(/NC,K00,0,_N_IBN_SS)")
```

Additional information

You can find information on PI services in the online help "Help for PI services for SINUMERIK 810D, 840D, FM-NC" in the following directories:

- <Installation directory of the TIA Portal>\Help\en-EN\pi-enEN.chm

9.5.10 SelectNCPartProgram

Description

You may implement some functions of part programs with the "NC program part" control. You can use the "SelectNCPartProgram" function to select all part programs via the NCU domain services.

For example, this allows you to create special screens for permanently-defined part programs. These screens can then support a simplified selection process using buttons.

Parameter	Meaning
Connection	Name of the connection to the NC.
Channel	Channel, for which the program is selected: 1 – max. 10 (variable or constant)
Path name	Absolute path details for the program directory (variable or constant)
Program name	The name of the program or workpiece to be edited (variable or constant)

Note

Together, the path name and program name parameters must indicate the part program path.

Enter only the absolute program or path name.

Path name examples:

- MPF_DIR for main directory
- SPF_DIR for subdirectory
- WKS_DIR for workpiece program directory

Procedure on the HMI device

The specified part program is selected on the NC for editing.

Example

The following example code is used to disable the "SelectPartProgram" button in the "NC program part" control.

VBScript

```
Sub Button_select_not_visable()
'VBS_Example_ScreenItems
Dim objNCpartprogram
Set objNCpartprogram = HmiRuntime.Screens("Screen_1").ScreenItems("NC part program
view_1")
objNCpartprogram.ButtonSelectPartProgramVisible = False
End Sub
```

The "Keyboard operation for screen objects" function group with "PartProgramListRefresh", for example, is not enabled for scripts.

9.6 System function calls within a script

Introduction

You can call the SINUMERIK system functions in WinCC even within a VBScript:

- The English function names are used here.
- In the "Connections" editor, you can see the name of your connection to the NC that you need as parameter in all functions.
- You can find general information on using VBScripts in WinCC in the information system of the TIA Portal, section "Visualizing processes > Working with system functions and Runtime scripting (Panels, RT Advanced, RT Professional)".

Example

VBScript

```
ResetNC "SinumerikNC"
```

SinumerikNC here represents the name that was selected for the connection to the NC.

See also

Appendix (Page 133)

Configure the language settings 10

10.1 Overview

You need to make various language settings depending on the scope of your configuration:

- If you create your project for multiple languages, you need to set them as project languages (Page 118) and runtime languages. You also use the table for language mapping between SINUMERIK Operate and TIA Portal (Page 122) for this.
- When using a PC system, you can make settings to synchronize the language switching between SINUMERIK Operate and WinCC RT Advanced (Page 119).

10.2 Enable project languages

Introduction

The project languages are set in the "Project languages" editor. You define which project language is to be the reference language and which the editing language.

Enable project languages

1. Click on the arrow to the left of "Languages & resources" in the project tree.

   The lower-level elements will be displayed.

2. Double-click on "Project languages".

   The possible project languages will be displayed in the working area.

3. Enable the relevant project languages.

Note

Copying multilingual objects

The copies of multilingual objects to a different project only include text objects in the project languages which are activated in the target project. Activate all project languages in the target project to include the corresponding text objects when transferring the copy.

Disabling project languages

1. Disable the languages which are not relevant for the project.

NOTICE
If you disable a project language, all text and graphic objects you have already created in this language will be deleted from the current project.

10.3 Configuring language selection (PC systems)

Validity of the description

This section relates to configuration with a PC system and does not apply to the configuration with SIMATIC Panels.

Introduction

You can automatically switch the language of WinCC RT Advanced Runtime when the language is changed in SINUMERIK Operate. However, it is not possible at this time to automatically apply the language in SINUMERIK Operate when the language is changed in the WinCC RT Advanced Runtime. Automatic language selection is currently only possible in one direction.

To configure language selection, create an HMI tag with the address of the PLC data block DB10.DBB96 (Page 122) in which the active language of SINUMERIK Operate is stored. You then define a relation between the configured language order and the language in SINUMERIK Operate using a VB script and have the script be automatically executed when the value changes.

Requirement

- A project is created and a PC HMI device is added to the Runtime WinCC RT Advanced.
  See Inserting PC system and Runtime (Page 42)
- The connection to the PLC and NC is configured.
  See Configuring connections (Page 53).
- The project languages are set.
  See Enable project languages (Page 118)
- The order of runtime languages is configured.
  See the information system of the TIA Portal, keyword "runtime language".

Procedure

To switch to the language of WinCC RT Advanced Runtime based on the language set in SINUMERIK Operate, follow these steps:

1. Double-click "Show all tags" in "PC System_1 > HMI_RT_1 > HMI tags" folder of the project tree.
2. Create a new HMI tag with the following values:

Column	Value
Name	Can be freely selected (in the example below: "DB10DBB96")
Tag table	Default tag table
Connection	PLC
Data type	Byte
Address	%DB10.DBB96

3. To create a new script, double-click "Add new VB function" in the "PC System_1 > HMI_RT_1 > Scripts > VB scripts" folder.
4. In the Inspector window under "Properties > General", select "Sub" as the type and assign a name (in the example "LangFromOperate").

5. Write a VB function according to the following scheme:

```
Sub LangFromOperate()

Select Case SmartTags("DB10DBB96") ' Selected Language in HMI Operate
Case 1 'German - Germany
 SetLanguage 0 ' "Order 0" in WinCC project Runtime settings
Case 3 'English - United Kingdom
 SetLanguage 1 ' "Order 1" in WinCC project Runtime settings
Case 2 'French - France
 SetLanguage 2 ' "Order 2" in WinCC project Runtime settings
Case 6 'Italian - Italy
 SetLanguage 3 ' "Order 3" in WinCC project Runtime settings
Case 4 'Spanish - Spain (Traditional Sort)
 SetLanguage 4 ' "Order 4" in WinCC project under Runtime settings
Case 8 'Chinese - People's Republic of China
 SetLanguage 5 ' "Order 5" in WinCC project under Runtime settings
End Select

End Sub
```

Code	Purpose
Select Case SmartTags ("<HMI tag>")	Evaluate the previously created HMI tag ("DB10DBB96" in the example), which contains the value of the active language in SINUMERIK Operate.
Case <n>	Condition that checks the value of the HMI tag. Value <n> corresponds to the respective language value of DB10.DBB96, see table "Language values of DB10.DBB96" (Page 122).
SetLanguage <n>	Sets the language to the corresponding value <n> in Runtime. Value <n> is the number from the Order column in "PC System_1 > HMI_RT_1 > Runtime settings > Language & font".

6. In the project tree, double-click on the previously created HMI tag.
7. In the Inspector window under "Properties > Events", click on "Value change" in the area navigation, then click <Add function> and select the previously created VB function (LangFromOperate in the example).

Result

The language of WinCC RT Advanced Runtime is automatically switched when the language is changed in SINUMERIK Operate.

However, it is not possible at this time to automatically apply the language in SINUMERIK Operate when the language is changed in the WinCC RT Advanced Runtime. Automatic language selection is currently only possible in one direction.

10.4 Language assignment in language-dependent texts

Language ID in the file name of language-dependent texts

Language-dependent texts are saved in TS files in SINUMERIK Operate. There is a separate file for each language which is assigned via the language ID in the file name. If you convert the DB2 alarms into the CSV format, this filename is kept, and the *.csv file extension added:

- <Name><LanguageID>.ts.csv
- For example: oem_alarms_plc_eng.ts.csv

When you import the CSV file in the TIA Portal, it is mapped to a specific project language in the TIA Portal depending on the language ID in the file name.

Storing the active language in DB10

The language that is presently active in SINUMERIK Operate is saved in communication block DB10 in address DB10.DBB96 as value.

Default languages in SINUMERIK Operate

SINUMERIK Operate has six languages installed in the factory state. If you need additional languages, you can install them separately.

Table 10- 1 Language assignment for language-dependent texts and language values in DB10

Value in DB10.DBB96	Language in SINUMERIK Operate	Language code	Default language	Assigned project language in the TIA Portal
1	German	deu	x	German (Germany)
2	French	fra	x	French (France)
3	English	eng	x	English (United States)
4	Spanish	esp	x	Spanish (Spain)
6	Italian	ita	x	Italian (Italy)
7	Dutch	nld		
8	Chinese Simplified	chs	x	Chinese (PR China)
9	Swedish	sve		
18	Hungarian	hun		
19	Finnish	fin		
28	Czech	csy		
50	Portuguese	ptb		
53	Polish	plk		
55	Danish	dan		
57	Russian	rus		
68	Slovakian	sky		
69	Slovenian	slv		
72	Rumanian	rom		
80	Chinese Traditional	cht		
85	Korean	kor		
87	Japanese	jap		
89	Turkish	trk		

Value in DB10.DBB96	Language in SINUMERIK Operate	Language code	Default language	Assigned project language in the TIA Portal
212	Thai	tha		
	Malay	msl		
	Indonesian	ind		

Loading and integrating a configuration (PC systems) 11

11.1 Overview

Introduction

Once you have set the configuration and compiled it, you need to transfer it to the PCU 50.5 and integrate it in SINUMERIK Operate.

The following options are available:

- Transferring the configuration outside of the TIA Portal in a conventional manner, e.g., with a USB flash drive or network.
- Transferring the configuration in the TIA Portal using the command "Extended download to device".
  You can select the PG/PC interface USB, COM, HTTP, Ethernet or file.

This section provides an example of the procedure when using the "Extended download to device" dialog with a "File" as "PG/PC Interface".

If you transfer the configuration to the PCU 50.5 in another way, you may only need to integrate the Runtime in SINUMERIK Operate (Page 130) instead.

Precondition

- The screen resolution is set (Page 46).
- If the header of SINUMERIK Operate is to be displayed at runtime, the screen size is configured (Page 48).
- The current status of the configuration is completely compiled.
  See: Information system, keyword "Project, compile".
- PCU 50.5 and PG/PC are available in the network.

  You can find information about the network configuration of the PCU 50.5 Windows 7 in the Basic Software and HMI Software commissioning manual under PCU Basic Software Windows 7 (IM10).

Procedure overview

Step	Description
1	On the PCU 50.5 create the target directory for configuration as network drive. In so doing, note that the path to this directory must not contain any spaces. If, for example, you have installed SINUMERIK Operate e.g. under C:\Program Files (x86)\, you cannot save the configuration in a subdirectory of this. Additional information on network drives is available in the help for Windows 7 or in the documentation for PCU 50.5: • Windows Support: Sharing files with other people (http://windows.microsoft.com/en-us/windows7/share-files-with-someone) • Commissioning manual "PCU Basesoftware Windows 7", Chapter "Drives C: and D: PCU 50.5 released in the network for administrator accounts"
2	Establish the connection to the configured network drive on the PG/PC. You can find additional information in the help for windows 7: • Windows Support: Create a shortcut to a network drive (mapping) (http://windows.microsoft.com/en-us/windows7/create-a-shortcut-to-map-a-network-drive) Depending on the network settings, you may need to specify the same user account and password that you use on the PCU 50.5.
3	Download the configuration to the PCU 50.5 (Page 127).
4	Integrate the runtime in SINUMERIK Operate (Page 130).

See also

Configuring the PG/PC interface (PC systems) (Page 28)

11.2 Loading configuration to a PCU 50.5

Requirement

- The screen resolution is set (Page 46).
- The configuration is compiled.
  See: Information system, keyword "Project, compile".
- The destination directory on the PCU 50.5 is displayed as network drive on the PG/PC.

Procedure

To load the project files to the PCU 50.5 via the TIA Portal, follow these steps:

1. Select the PC system in the project tree and select "Download to device > Software (all)" from the shortcut menu.
   The "Extended download to device" dialog opens.

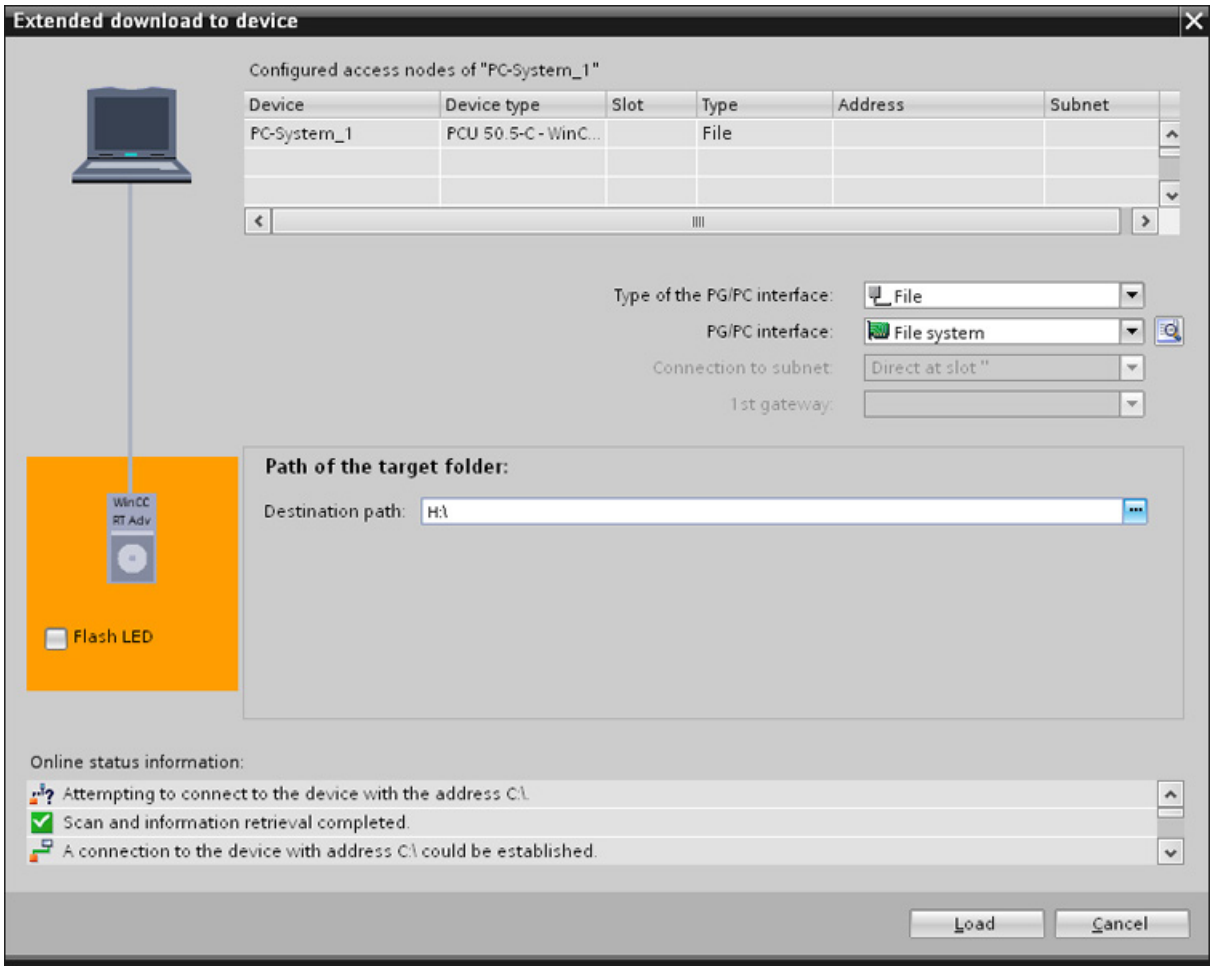


Figure 11-1 "Extended download to device" dialog with settings for loading to PCU 50.5

2. Make the following settings:

Area	Setting
PG/PC interface type	File
PG/PC interface	File system
Target path	The drive letter of the newly-created drive on the configuration PC.

3. Click "Download".

Result

The project files are copied to the directory on the PCU 50.5, which you have defined as a network drive.
The next task is to integrate the configuration in SINUMERIK Operate (Page 130).

Additional information

You can find additional information about loading projects in the information system of the TIA Portal, section "Visualizing processes> Compiling and downloading > Loading projects".

11.3 Integrating Runtime in SINUMERIK Operate (PC systems)

You use the "Integration SINUMERIK Operate" tool to integrate the "WinCC RT Advanced" Runtime in SINUMERIK Operate. You can make various settings in the corresponding dialog, for example, you can specify the softkey via which the Runtime of SINUMERIK Operate is available.

The tool is installed on the PCU 50.5 by the setup program for SINUMERIK Integrate Create MyHMI /WinCC. "WinCC RT Advanced" Runtime supplied on the product DVD must be installed beforehand for this purpose.

See: Installing software on the PC system (PCU 50.5) (Page 26)

Requirement

- The operating system of the PC system is Windows 7.
- The following software is installed on the PC system:
  - "WinCC RT Advanced" Runtime supplied on the product DVD is installed.

    See Installing software on the PC system (PCU 50.5) (Page 26).
  - SINUMERIK Integrate Create MyHMI /WinCC is installed.

    See Installing software on the PC system (PCU 50.5) (Page 26).
  - SINUMERIK Operate is installed.
- The configuration file "pdata.fwc" can be accessed from the PC system and the path to this file does not contain spaces.

Procedure

To integrate the Runtime in SINUMERIK Operate, follow these steps:

1. On the PC system (e.g. PCU 50.5), click in the Windows Start menu on "Start > Siemens Automation > SINUMERIK > Integration Sinumerik Operate English Tool".

   The "Integration SINUMERIK Operate" dialog opens.

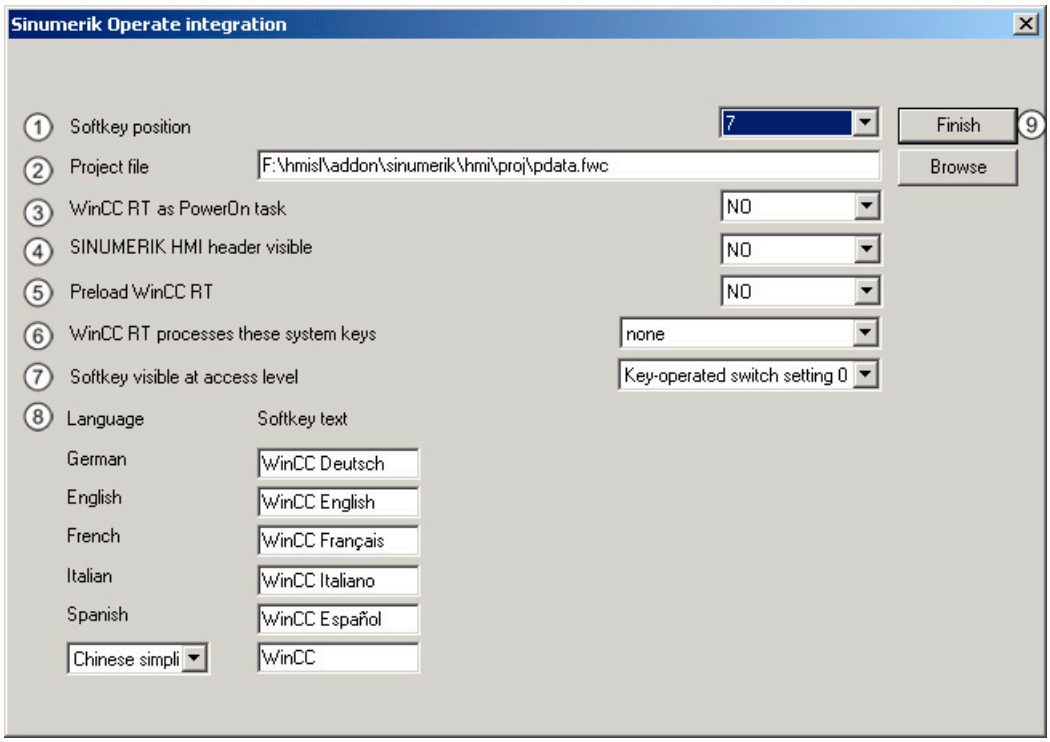


Figure 11-2 Example of a completed "Integration SINUMERIK Operate" dialog

2. Make the required settings:

No.	Array	Definition/Action
①	Softkey position	The drop-down list shows the currently free, assignable horizontal softkeys. Select an available softkey (default softkey = 7).
②	Project file	The TIA Portal configuration file of the WinCC RT Advanced can be entered by means of the input box. The configuration file is displayed with the "Browse" button. The path to the "pdata.fwc"project file may not contain any spaces.
③	WinCC RT as power up application	Here you specify if the WinCC Runtime application covers up SINUMERIK Operate when it starts up. • NO: SINUMERIK Operate is not covered. • YES: SINUMERIK Operate is covered.

No.	Array	Definition/Action
④	SINUMERIK HMI header visible	Here you can define whether the header of SINUMERIK Operate (display of the operating area, operating mode, alarms, etc.) is to be visible for the WinCC application. • NO: Header is not visible. • YES: Header is visible. If YES is entered here, the location of the header on the configuration interface of each WinCC screen must be kept free for this. See: Configuration of the screen size (PC systems) (Page 48)
⑤	Load WinCC RT during power up	Specifies if the application is started in the background during power up of SINUMERIK Operate. • NO: Application is not started. • YES: Application is started.
⑥	These system keys are only processed by WinCC RT	Here you can define whether/which keys are to be provided directly to the application. The selected system keys are not processed by SINUMERIK Operate. • Alarm acknowledgement: ESC is directly assigned to the application • Channel switching: F11 is directly assigned to the application
⑦	Softkey visible as of access level	Use the drop-down menu to specify as of which access level the softkey is visible.
⑧	Language/softkey text	The softkey labeling for the respective language can be entered in the input boxes under softkey text.

3. Confirm the settings with "Exit".

   A dialog for prompting saving appears.

   – Select "Yes" to save all entries and the dialog box is exited.

   – Select "No" and the dialog box is exited without saving the entries.

   – Select "Cancel" to cancel the close process and return to the integration tool.

Result

Runtime is integrated according to your settings in SINUMERIK Operate.

You usually need to integrate Runtime in SINUMERIK Operate only once. You only need to repeat the process if you want to change something in the settings for the integration of Runtime in SINUMERIK Operate (e.g. the softkey position).

If you change the configuration, although you need to save the latest compiled configuration file again at the configured location, Runtime does not need to be integrated into SINUMERIK Operate again.

Appendix

A

A.1 SINUMERIK functions, which can be triggered using certain events of the WinCC RT Advanced

Introduction

The following tables list the functions for the relevant WinCC objects and their associated events that are used for SINUMERIK with SIMATIC Panels. These functions are indicated by a **crpss** in the table.

In the following five tables, these are the WinCC objects

- Tags
- Function keys
- Buttons
- Screen
- Alarms
- OCX
- Script
- Scheduler

SINUMERIK functions, which can be triggered using certain events of the WinCC RT Advanced, part 1

Object	Variables			Softkey			
				Global		Local	
Event	Value changed	Upper limit exceeded	Lower limit fallen below	Release	Press	Release	Press
Functions							
SetS7OperatingMode	X	X	X	X	X	X	X
AcknowledgeNCCancelAlarms	X	X	X	X	X	X	X
LogonNC	X	X	X	X	X	X	X
LogoffNC	X	X	X	X	X	X	X
ChangeNCPassword	X	X	X	X	X	X	X
SetNCUserFrame	X	X	X	X	X	X	X
SelectNCPartProgram	X	X	X	X	X	X	X
PrepareActualNCBlockForDisplay							

Object	Variables			Softkey			
				Global		Local	
Event	Value changed	Upper limit exceeded	Lower limit fallen below	Release	Press	Release	Press
Functions							
StartNCPIService	X	X	X	X	X	X	X
ResetNC	X	X	X	X	X	X	X
ConfigureNCMachineData	X	X	X	X	X	X	X
ScreenObjectCursorUp				X	X	X	X
ScreenObjectCursorDown				X	X	X	X
ScreenObjectPageUp				X	X	X	X
ScreenObjectPageDown				X	X	X	X
PartProgramListSelectNCPartProgram				X	X	X	X
PartProgramListDirUp				X	X	X	X
PartProgramListDirDown				X	X	X	X
PartProgramListRefresh				X	X	X	X

SINUMERIK functions, which can be triggered using certain events of the WinCC RT Advanced, part 2

Object	Command buttons			
	Global		Local	
Event	Release	Press	Release	Press
Function				
SetS7OperatingMode	X	X	X	X
AcknowledgeNCCancelAlarms	X	X	X	X
LogonNC	X	X	X	X
LogoffNC	X	X	X	X
ChangeNCPassword	X	X	X	X
SetNCUserFrame	X	X	X	X
SelectNCPartProgram	X	X	X	X
StartNCPIService	X	X	X	X
ResetNC	X	X	X	X
ConfigureNCMachineData	X	X	X	X

SINUMERIK functions, which can be triggered using certain events of the WinCC RT Advanced, part 3

Object	Screen		Messages						
			Alarm				Event		
Events	Loaded	Cleared	Activate	Clear	Acknowledge	Edit	Activate	Clear	Edit
Functions									
LogonNC	X	X							
LogoffNC	X	X							
ChangeNCPassword	X	X							
SetNCUserFrame	X	X	X	X	X	X	X	X	X
SelectNCPartProgram	X	X	X	X	X	X	X	X	X
PrepareActualNCBlockForDisplay	X								
StartNCPIService	X	X	X	X	X	X	X	X	X
ResetNC	X	X	X	X	X	X	X	X	X
ConfigureNCMachineData	X	X	X	X	X	X	X	X	X
ScreenObjectCursorUp	X	X							
ScreenObjectCursorDown	X	X							
ScreenObjectPageUp	X	X							
ScreenObjectPageDown	X	X							
PartProgramListSelectNCPartProgram	X	X							
PartProgramListDirUp	X	X							
PartProgramListDirDown	X	X							
PartProgramListRefresh	X	X							

SINUMERIK functions, which can be triggered using certain events of the WinCC RT Advanced, part 4

Objects	OCX			Script
	OCX (ScreenItem)			InScripts
Event	Press, Release, Click, Change (or Toggle when used on a Switch), SwitchOn, SwitchOff	Activate	Deactivate	
Functions				
SetS7OperatingMode	X	X	X	X
AcknowledgeNCCancelAlarms	X	X	X	X
LogonNC	X	X	X	X
LogoffNC	X	X	X	X
ChangeNCPassword	X	X	X	X
SetNCUserFrame	X	X	X	X
SelectNCPartProgram	X	X	X	X
PrepareActualNCBlockForDisplay				
StartNCPIService	X	X	X	X
ResetNC	X	X	X	X
ConfigureNCMachineData	X	X	X	X
ScreenObjectCursorUp	X	X	X	
ScreenObjectCursorDown	X	X	X	
ScreenObjectPageUp	X	X	X	
ScreenObjectPageDown	X	X	X	
PartProgramListSelectNCPartProgram	X	X	X	
PartProgramListDirUp	X	X	X	
PartProgramListDirDown	X	X	X	
PartProgramListRefresh	X	X	X	

SINUMERIK functions, which can be triggered using certain events of the WinCC RT Advanced, part 5

Object	Scheduler					
Event	ExpireTime	ScreenChange	ChangeUser	AlarmOverflowBuffer	StartUp	ShutDown
Function						
LogoffNC			X			X

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