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# Display of SINAMICS Error Messages in Runtime Professional

SINAMICS G120, WinCC Runtime Professional

https://support.industry.siemens.com/cs/ww/en/view/109738320

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# Table of Contents

# 1 Task

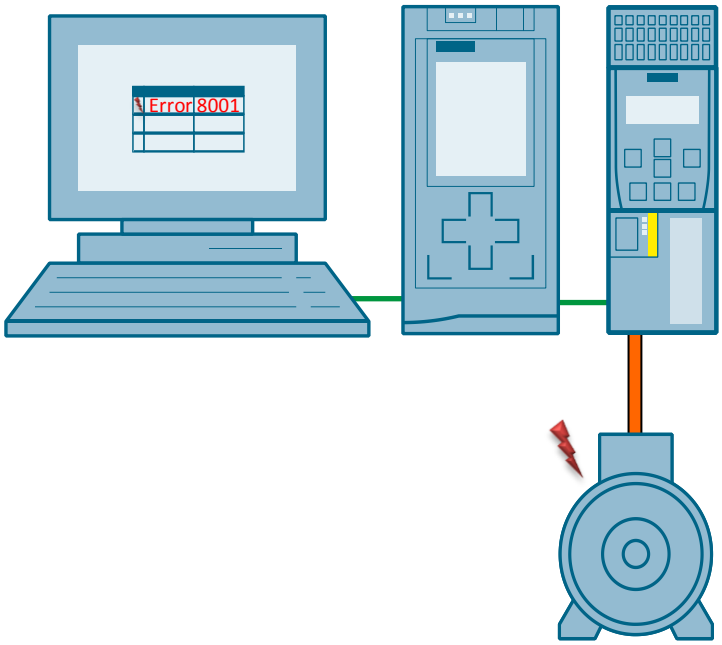
### Description of the automation task

This application example shows how you can read warning and error messages from the frequency converter and display them in the alarm view of WinCC Runtime Professional.

### Overview of the automation task

The figure below provides an overview of the automation task.

Figure 1-1

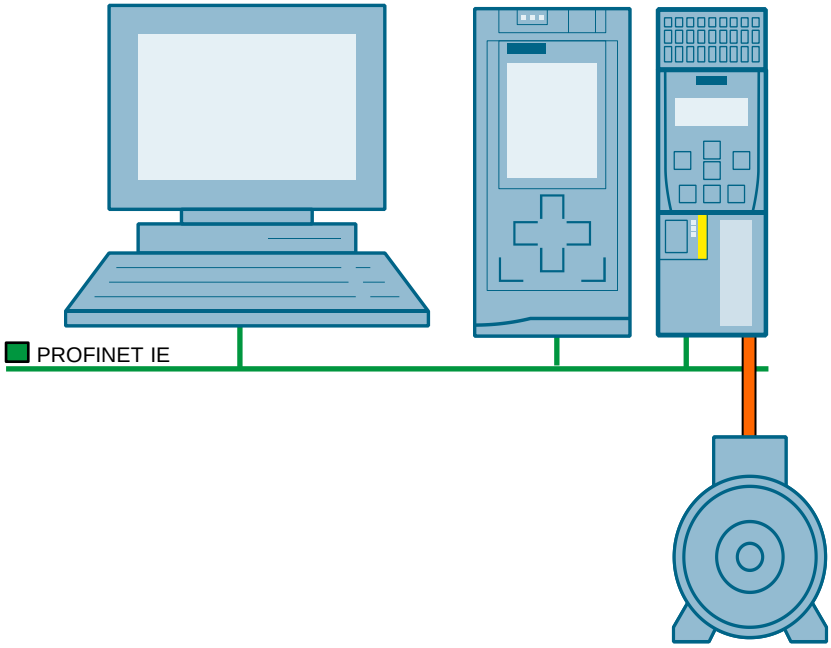


# 2 Solution

## 2.1 Configuration

### Diagrammatic representation

Figure 2-1




### Example

Using WinCC Runtime Professional, you want to:

- Display warning and error messages via the alarm view

### Required knowledge

To implement the solution described in this document, basic knowledge of the following topics is required:

- Automation technology
- Commissioning of the SINAMICS G120 frequency converter

## 2.2 Hardware and software components

### 2.2.1 Validity

This application is valid for

- TIA Portal V13 SP1 Update 7

### 2.2.2 Components used

The application was created with the following components:

**Hardware components**

Table 2-1

| Component | No. | Article number | Note |
|---|---|---|---|
| SINAMICS Control Unit CU240E-2 PN-F | 1 | 6SL3244-0BB13-1FA0 | Firmware >= V4.7 |
| SINAMICS PM240-2 | 1 | 6SL3210-1PB13-0AL0 | |
| SIMATIC IPC 677D | 1 | 6AV7260-5GM40-0XX0 | Alternatively, you can use a different IPC. |
| SIMATIC S7 1516-3 PN/DP | 1 | 6ES7516-3AN00-0AB0 | Alternatively, you can use a different S7-1500. |
| Low-voltage motor | 1 | 1LA7060-4AB10-Z | |

**Software components**

Table 2-2

| Component | No. | Article number | Note |
|---|---|---|---|
| SINAMICS Startdrive V13 | 1 | 6SL3072-4DA02-0XG0 | |
| WinCC Runtime Professional V13 | 1 | 6AV2105-....3-0 | |
| STEP 7 Professional V13 | 1 | 6ES7822-1..03 | |

**Sample files and projects**

The following list contains all files and projects that are used in this example.

Table 2-3

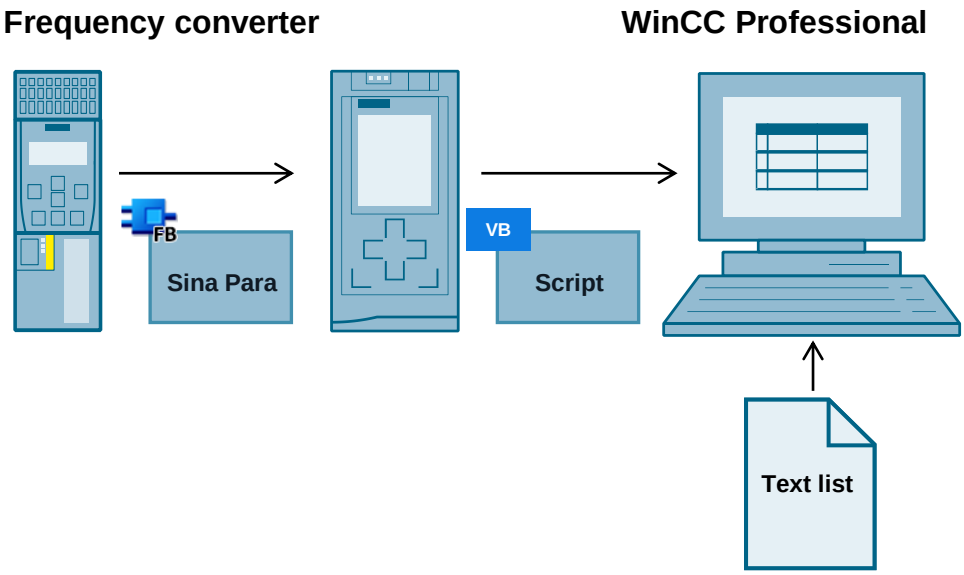
| Component | Note |
|---|---|
| 109738320_HMI_FU_CODE_v13.zip | This zip file contains the WinCC TIA Portal project. |
| 109738320_HMI_FU_DOKU_v13_e.pdf | This document. |

# 3 Basics

## 3.1 Access to converter parameters

Parameters in the SINAMICS drive are accessed using the SINA PARA block of the S7-1500. Parameter 2132 (current warning messages) and parameter 2131 (current error messages) are read with the aid of the SINA block. Using a VBScript script, the warning and error messages are displayed as user alarms in the alarm view of WinCC Professional. The text list contains the error and warning message of the respective SINAMICS drive.

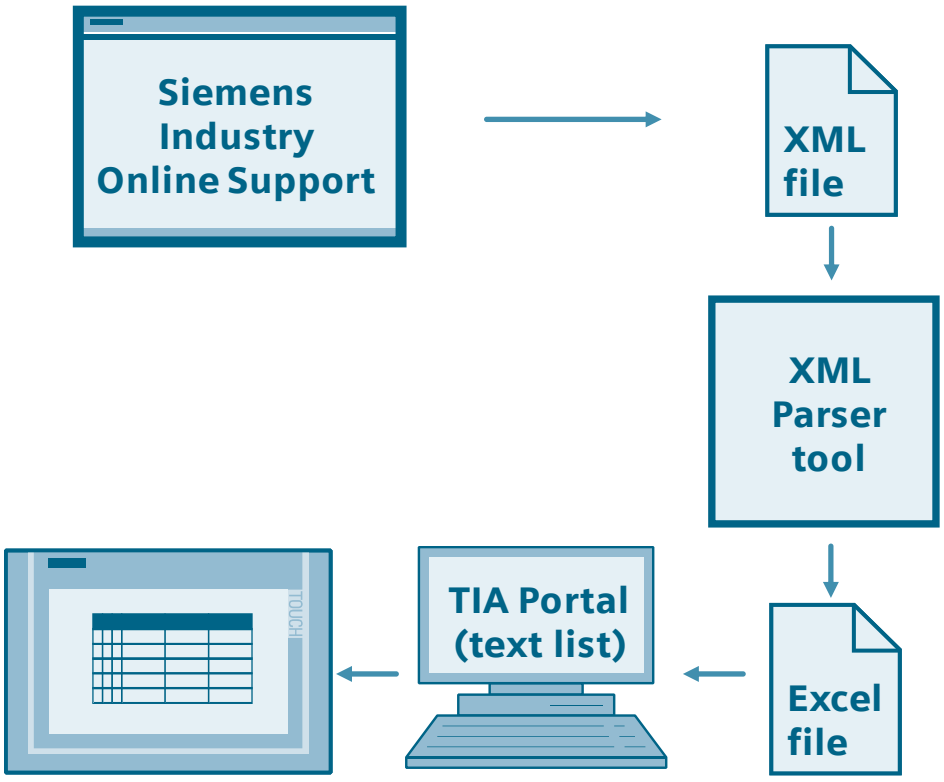
Figure 3-1



## 3.2 Creating error messages in WinCC Professional

In Industry Online Support, you will find an XML file that contains fault and warning messages for your drive component and firmware. This file must be downloaded from the Internet. With the aid of the XML Parser tool, the XML file can be converted to Excel. This format can be inserted into a text list of your TIA Portal project. With the aid of a user alarm, the HMI with the error and warning messages is linked to a text list. It is displayed in the HMI via an alarm view.

Figure 3-2



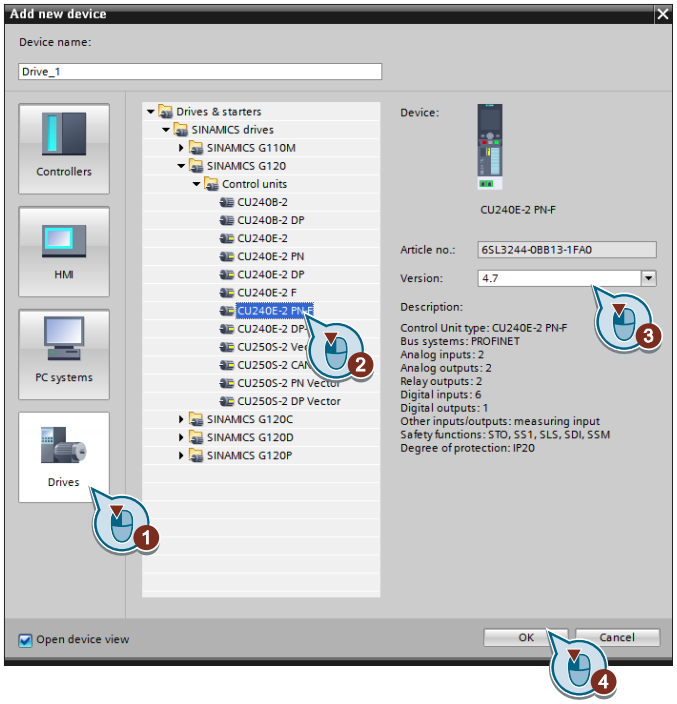
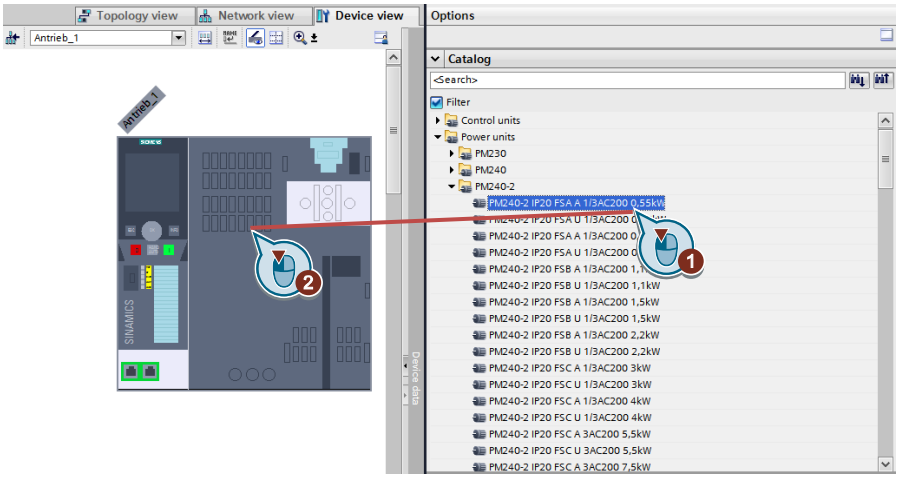
# 4 Configuration and Project Engineering: Drive

## 4.1 Adding the frequency converter to the project

If the “Startdrive” option package is installed in TIA Portal, the G120 can be added as a new device, configured and parameterized. Alternatively, you can configure the frequency converter using STARTER plus SSP for version 4.7 or higher.

For the “Startdrive” option package, please refer to the following Entry ID: 68034568

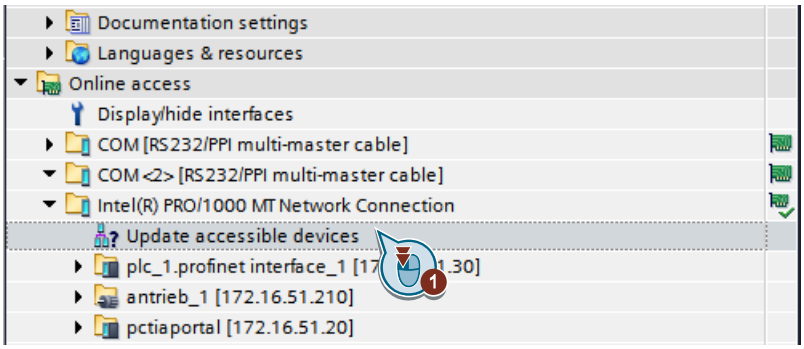
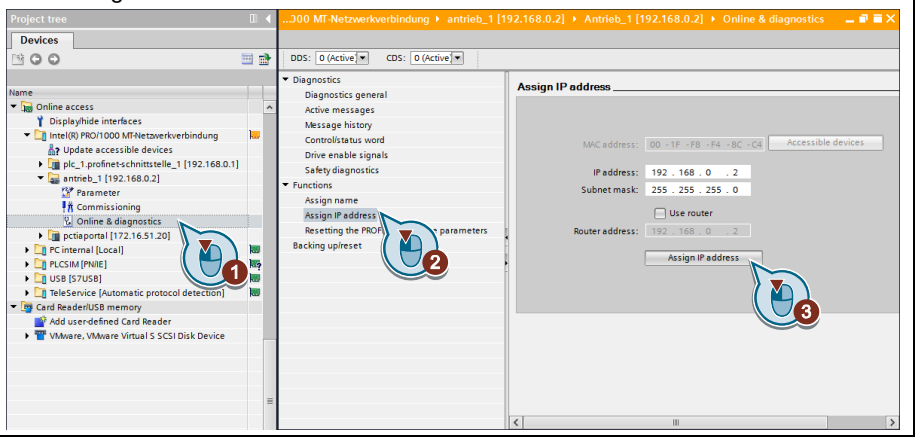
Table 4-1

| No. | Action |
|---|---|
| 1. | Add a control unit to your project: In the project tree, go to “Add new device → Drives” and select your control unit.<br>  |
| 2. | Add the power module to your control unit.<br>  |

# 4.2 Setting the Ethernet address

In order to establish a connection via Ethernet, assign an IP address to the SINAMICS converter. To do this, the SINAMICS offers the following options:

Table 4-2

| No. | Procedure |
|---|---|
| 1. | In the “Online access” menu, double-click the “Update accessible devices” menu item.<br>  |
| 2. | In the list of accessible devices, select the drive and activate “Online & diagnostics”. Then assign an IP address and a PROFINET name to the converter.<br>  |

# 4.3 Running the Commissioning Wizard

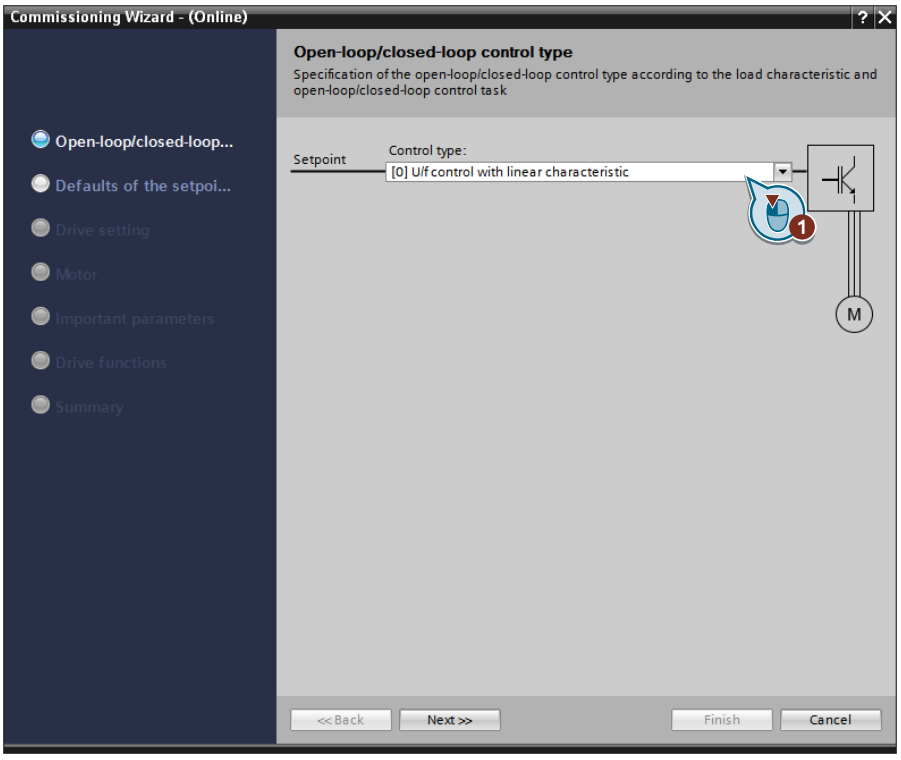
The Startdrive Commissioning Wizard allows you to perform commissioning in a short time. Startdrive supports offline commissioning in the project or online commissioning directly on the drive unit. After offline commissioning, download the configuration from the PG/PC to the unit; after online commissioning, download the configuration from the drive unit to your project. In the next step, you will get to know online commissioning.

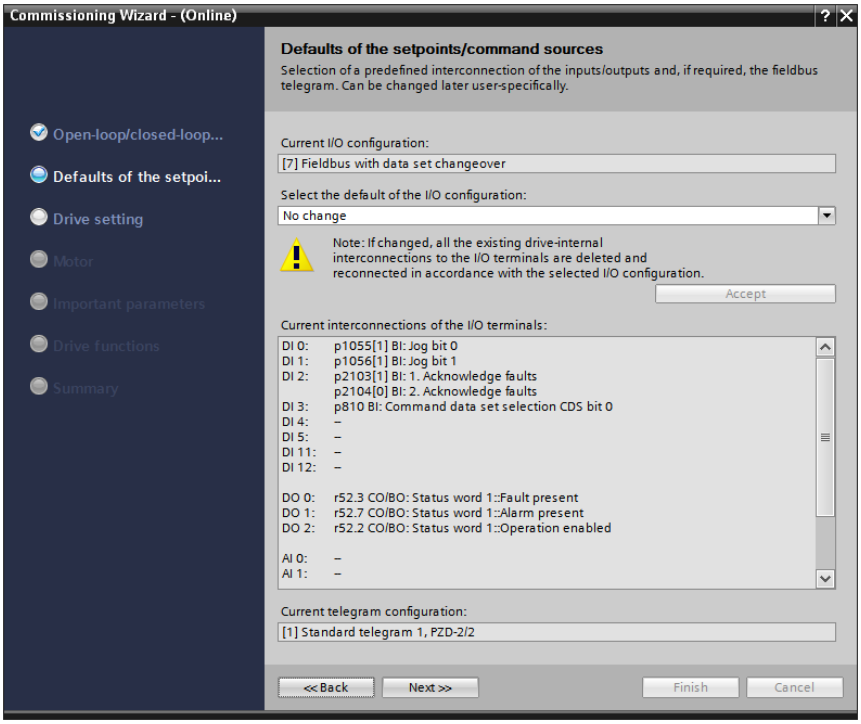
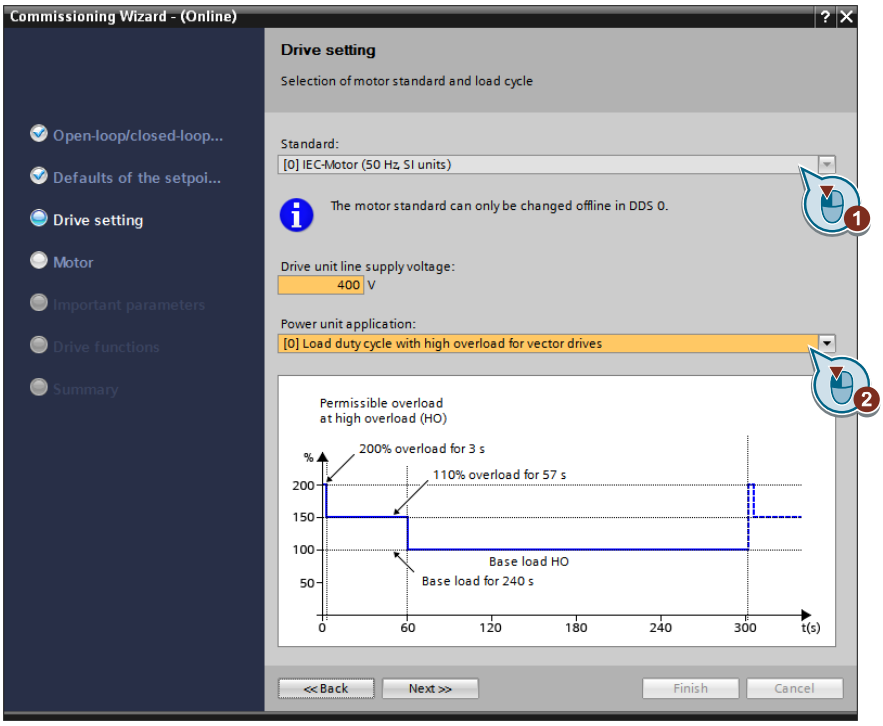
**Note**

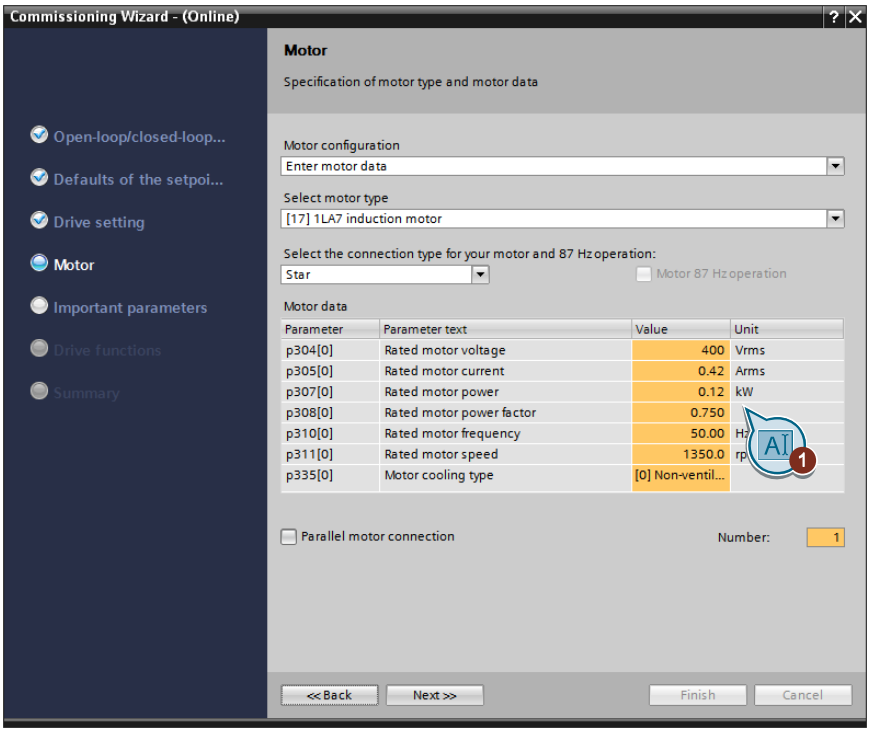
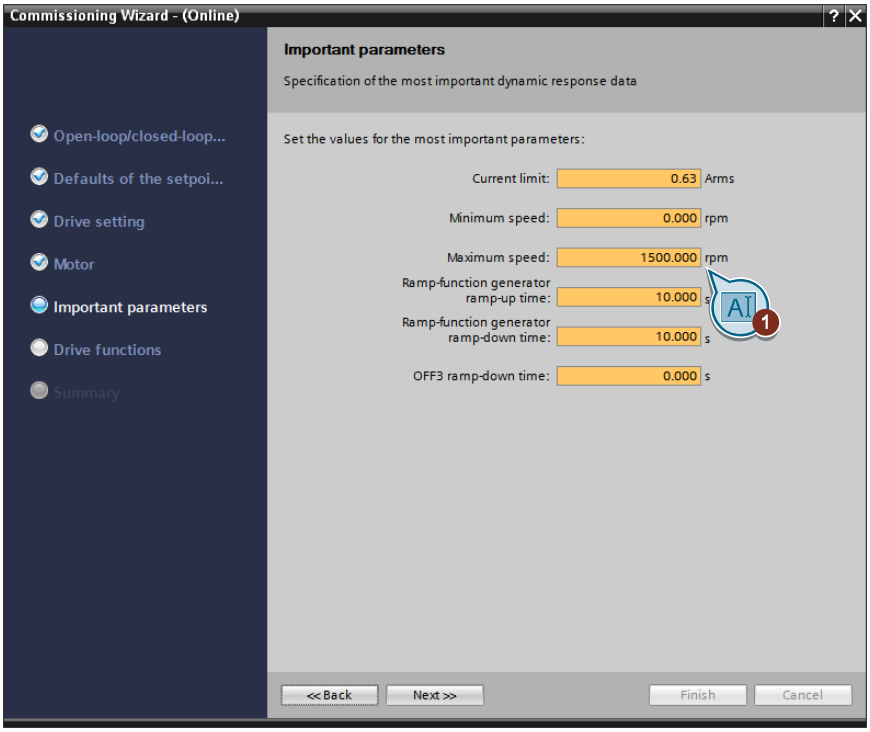
**Quick online commissioning**

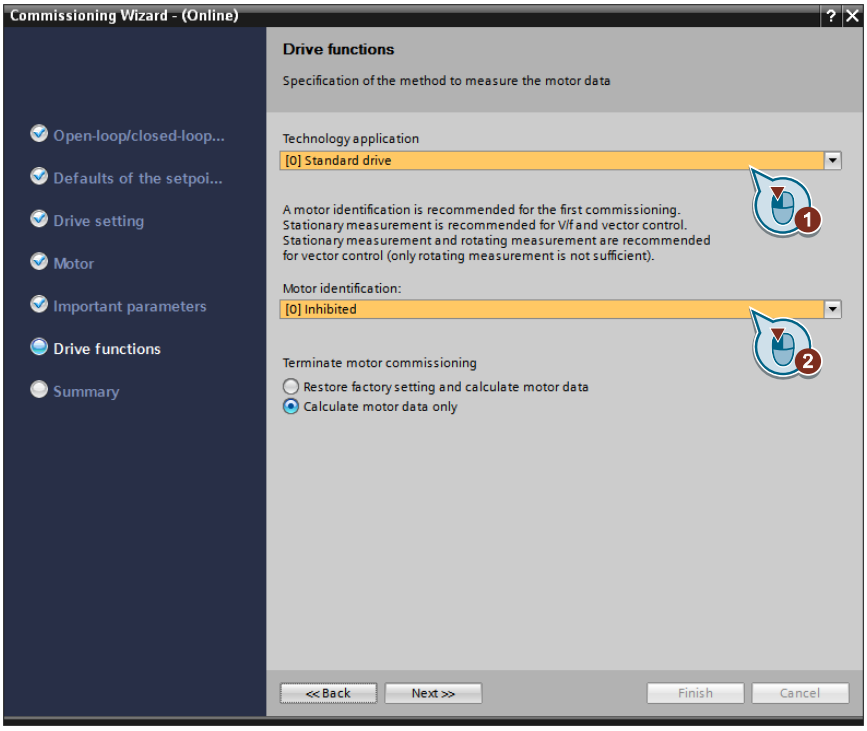
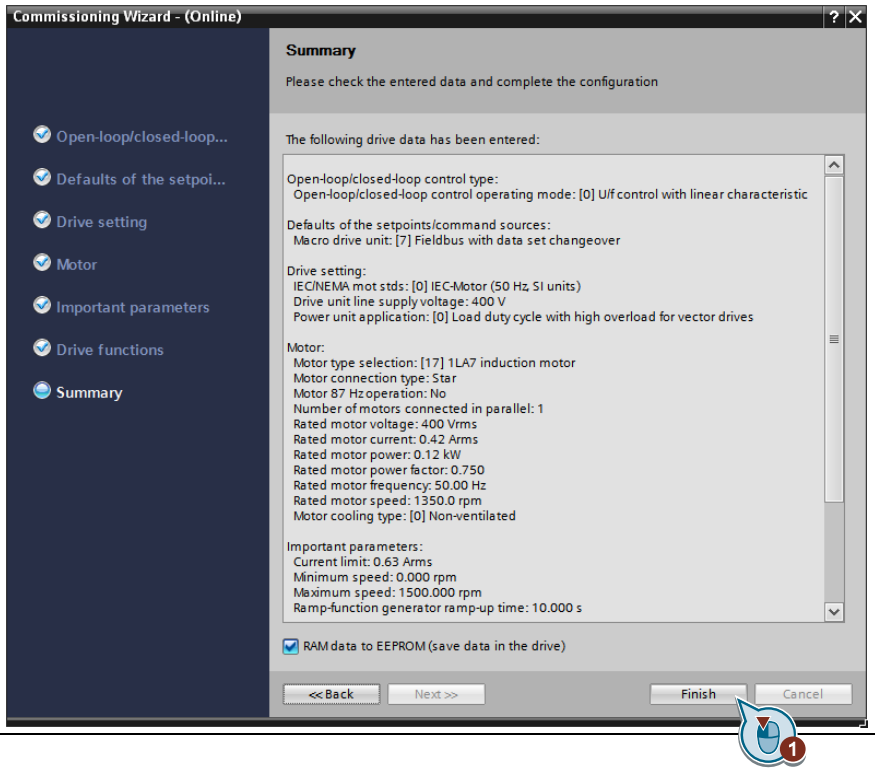
Before commissioning, you have to connect Startdrive online to the drive unit.

Table 4-3

| No. | Action |
|---|---|
| 1. | In the project navigator, select the drive unit and in the context menu, select “Go online”. |
| 2. | In the project navigator, double-click “Commissioning”. A window appears in the workspace.<br>In the workspace, click “Commissioning Wizard”. The wizard starts. |
| 3. | Set the open-loop/closed-loop control type. Click “Next” to confirm the settings.<br>  |

| No. | Action |
|---|---|
| 4. | Select the setpoints and command sources. Click “Next” to confirm the settings.  |
| 5. | The motor standard used is “IEC motor 50Hz SI units”, the power unit application is “Load duty cycle with high overload for vector drives”. Click “Next” to confirm the settings.  |

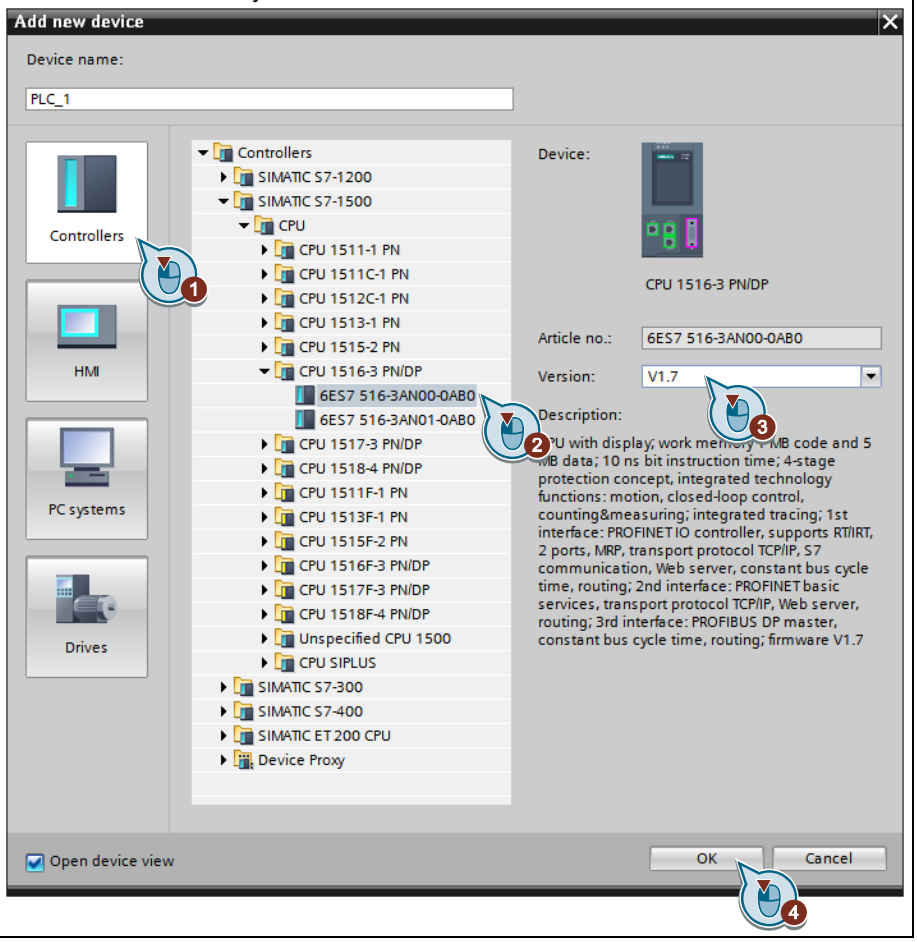
| No. | Action |
|---|---|
| 6. | For the motor data, refer to the motor rating plate and enter it in the Motor dialog. Click “Next” to confirm the settings.<br>  |
| 7. | In the “Important parameters” dialog, you can customize the ramp-up times, the current limit and the minimum and maximum speed. Click “Next” to confirm the settings.<br>  |

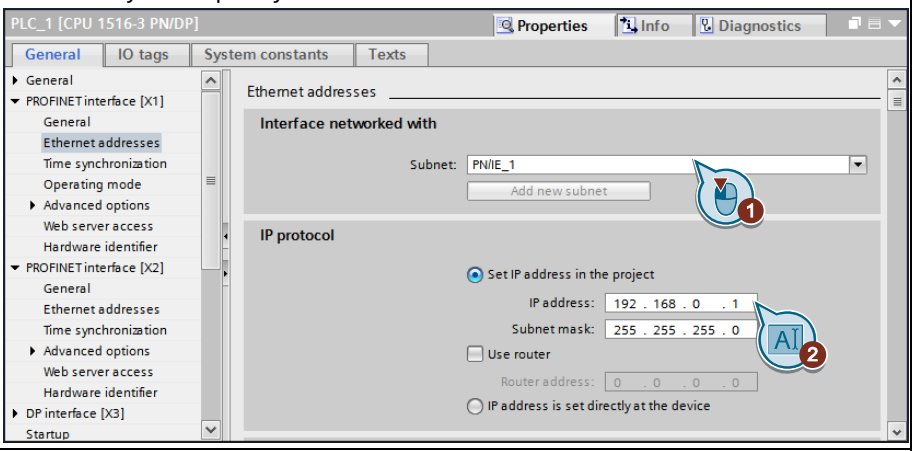
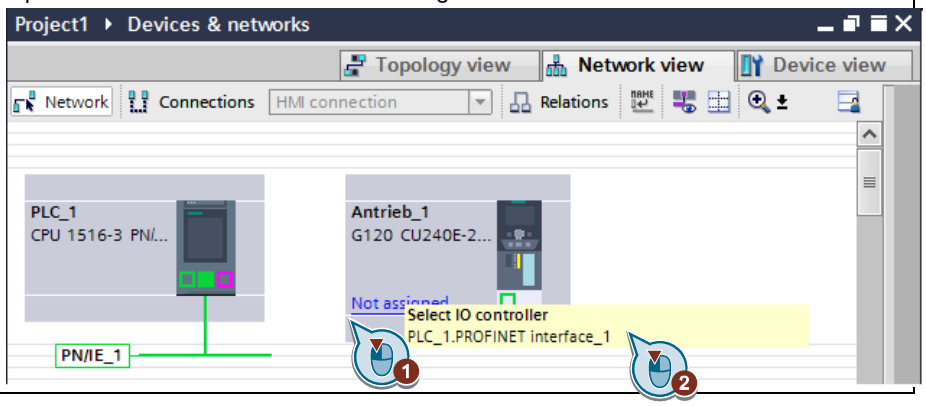
| No. | Action |
|---|---|
| 8. | Specify the motor identification. Click “Next” to confirm the settings.<br>  |
| 9. | In Summary, confirm your settings and click the Finish button.<br>  |

# 5 Configuration and Project Engineering: PLC

## 5.1 Adding the PLC to the project

Table 5-1

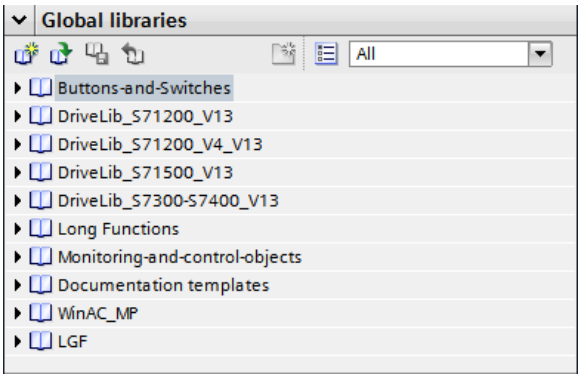
| No. | Action |
|---|---|
| 1. | Add a controller to your project: In the project tree, go to “Add new device → Controllers” and select your controller.<br>  |

| No. | Action |
|---|---|
| 2. | Select a subnet and assign an IP address to your controller that is in the same network as your frequency converter.<br>  |
| 3. | Open the Devices & networks view. Assign a controller to the control unit.<br>  |

## 5.2 Adding the DriveLib library

The DriveLib library provides standard blocks for easy implementation of a cyclic/acyclic communication connection between a SIMATIC S7-300/400/1200/1500 controller and a drive with the SINAMICS S/G converter system.

Table 5-2

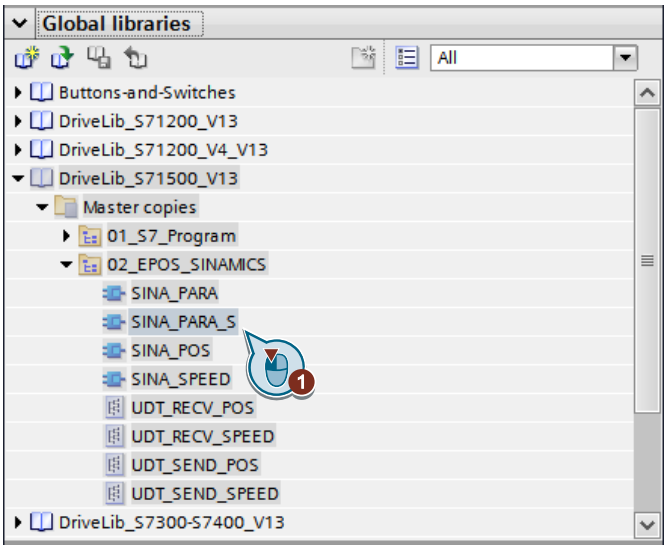
| No. | Action |
|---|---|
| 1. | Download the Drive LIB library at this Entry ID link: 109475044 |
| 2. | Unzip the library. |
| 3. | In TIA Portal, open the “Libraries” task card. |
| 4. | Add the library to your TIA Portal project.<br>  |

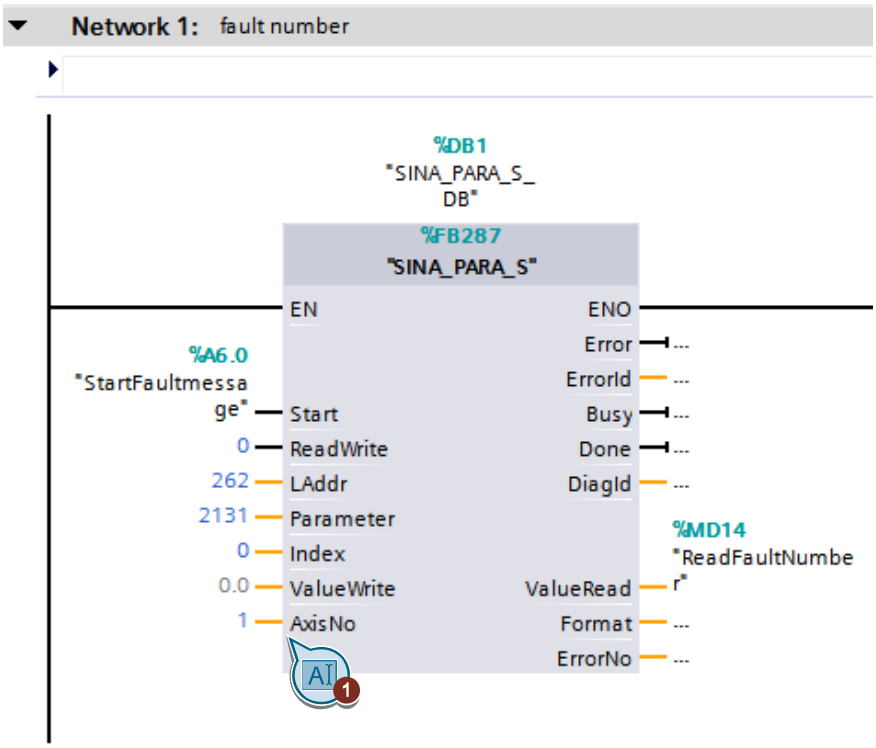
## 5.3 Adding the SINA_PARA_S block to the controller

The SINA_Para_S function block is used to easily connect different SINAMICS S/G converter systems to a SIMATIC S7 controller. The block can be used with the following CPUs: S7-300/400/1200/1500.

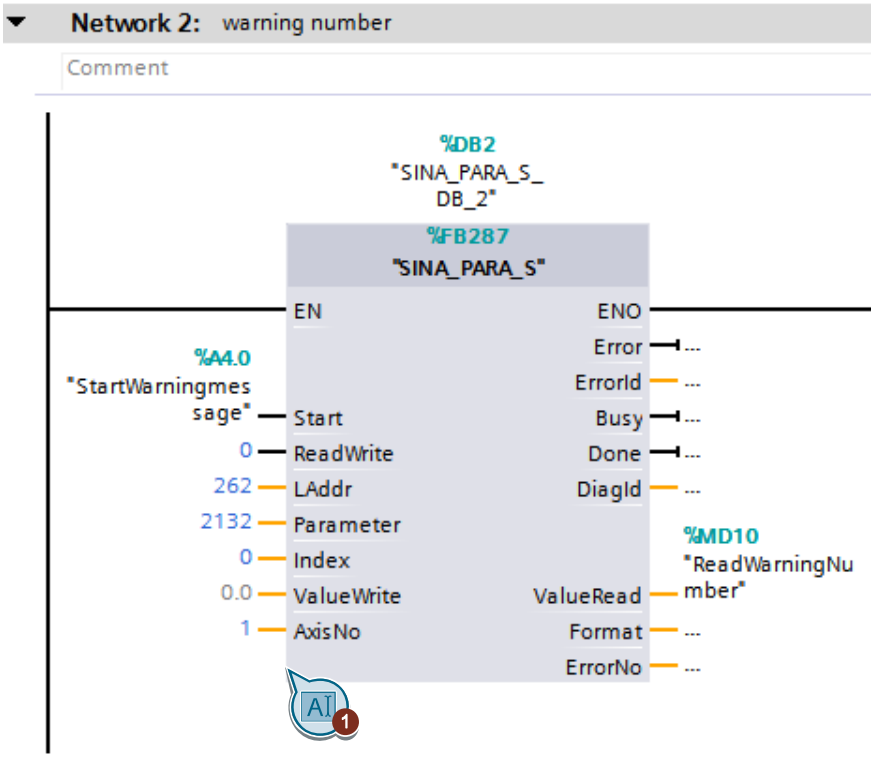
The acyclic communication block FB287 (SINA_PARA_S) provides the user with a predefined interface for easy read/write access to any SINAMICS drive parameters. The only data the user has to specify is the parameter number, a possible index and – for write access – a parameter value. After starting the job, the job is processed autonomously.

For more information about the block, please refer to the following Entry ID: 109475044

| No. | Action |
|---|---|
| 1. | Insert the SINA_PARA_S block twice into your organization block OB1.<br>  |

<table>
<tr><th>No.</th><th>Action</th></tr>
<tr><td>2.</td><td>
Read the error message [parameter 2131] of the SINAMICS G120 using the SINA block.<br><br>
The “StartFaultmessage” PLC tag was created for starting the read job. The current error number is written to the “ReadFaultNumber” tag.<br><br>
<table>
<tr><th>Input signal</th><th>Type</th><th>Meaning</th></tr>
<tr><td>Start</td><td>BOOL</td><td>Start of read job</td></tr>
<tr><td>ReadWrite</td><td>BOOL</td><td>Type of job<br>0 = read, 1 = write</td></tr>
<tr><td>LAddr</td><td>HW-IO/INT</td><td>Hardware ID/address of axis or drive</td></tr>
<tr><td>ParaNo</td><td>INT</td><td>Parameter number [parameter 2131 = error message]</td></tr>
<tr><td>Value Write</td><td>REAL</td><td>Value of parameter</td></tr>
<tr><td>AxisNO</td><td>INT</td><td>Axis number/axis ID for system with multiple axes</td></tr>
<tr><td>ValueRead</td><td>REAL</td><td>Value of read parameter</td></tr>
</table>
<br>


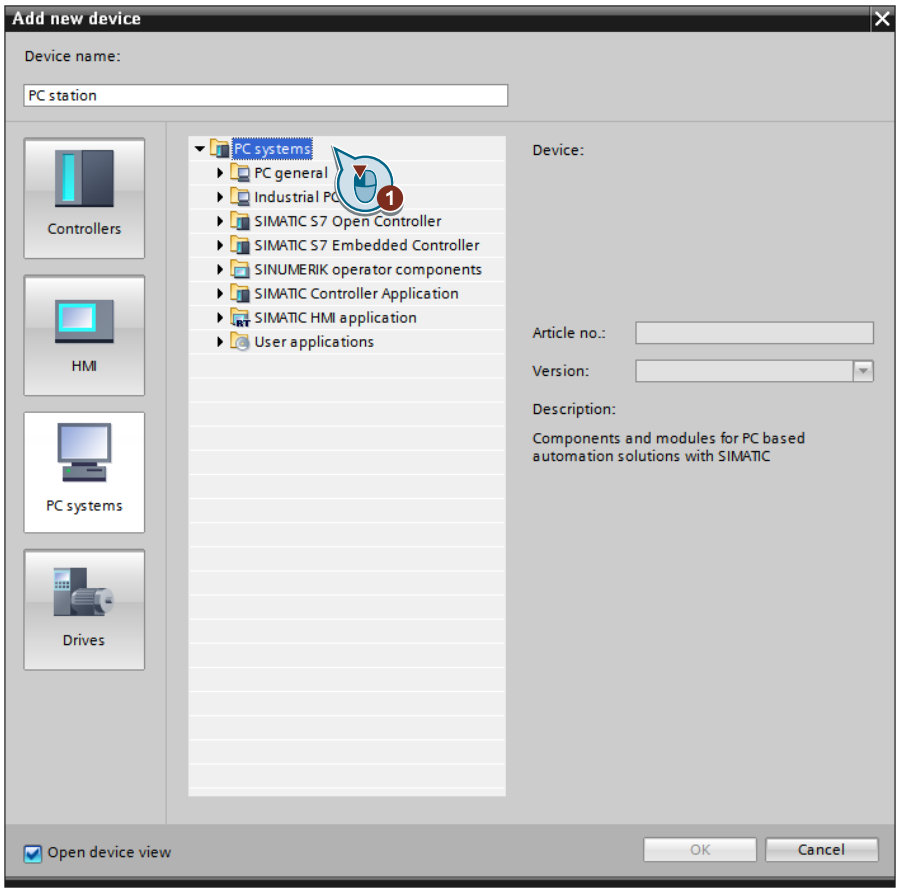
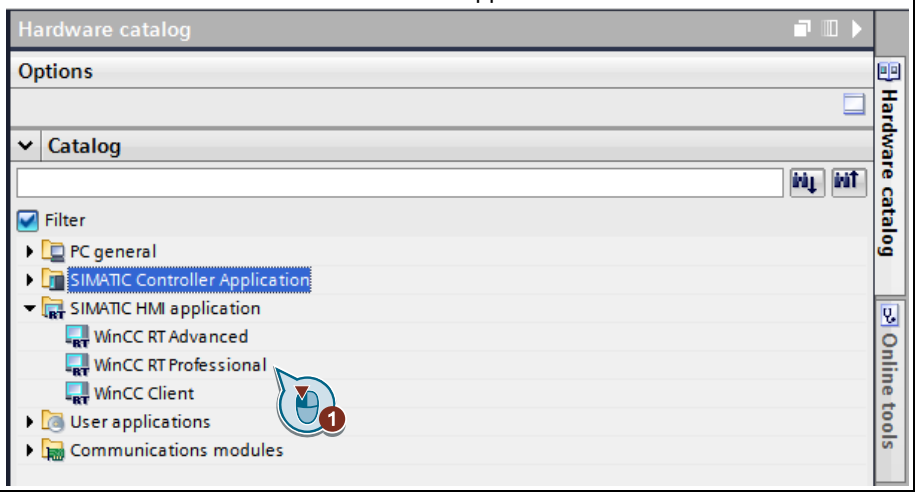
</td></tr>
</table>

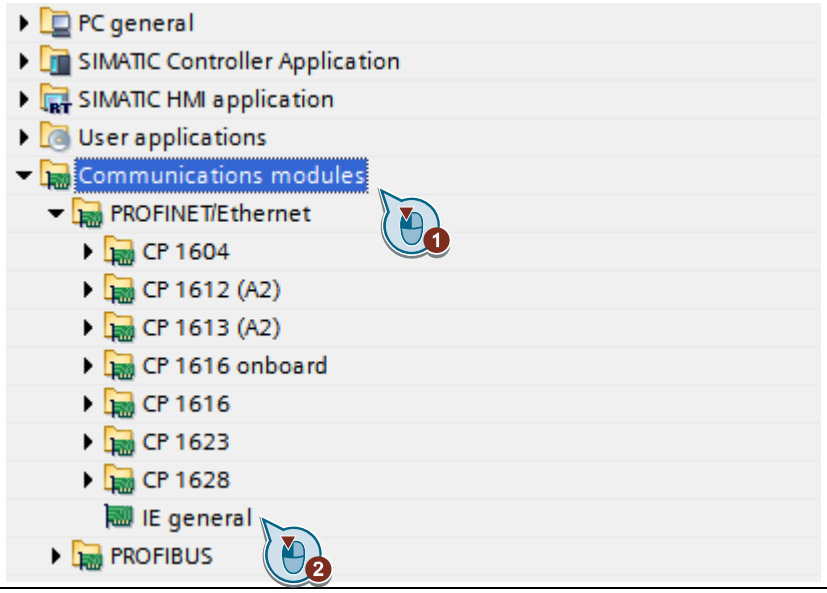
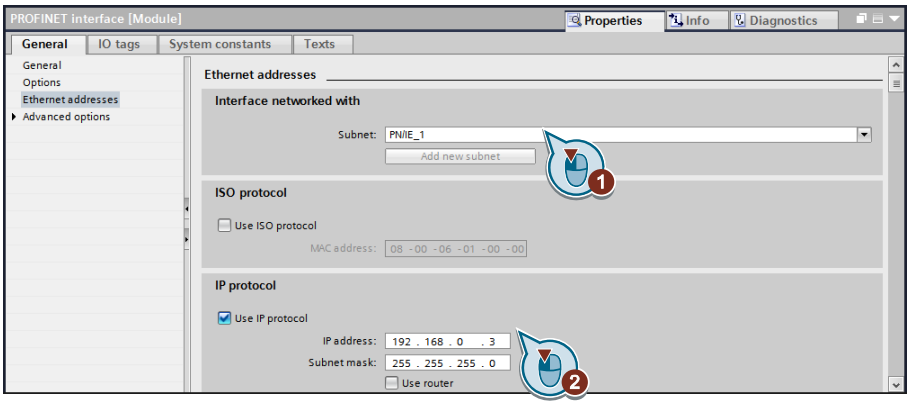
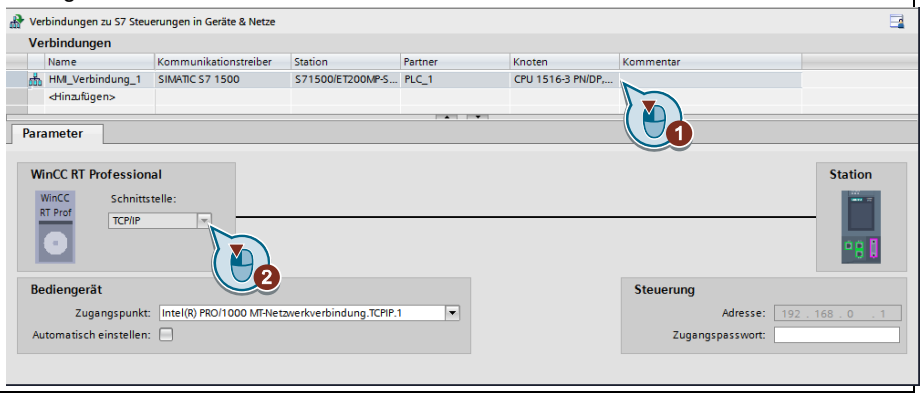
<table>
<tr><th>No.</th><th>Action</th></tr>
<tr><td>3.</td><td>
Read the warning message [parameter 2132] of the SINAMICS G120 using the SINA block.<br><br>
The “StartWarningmessage” PLC tag was created for starting the read job. The current warning number is written to the “ReadWarningNumber” tag.<br><br>
<table>
<tr><th>Input signal</th><th>Type</th><th>Meaning</th></tr>
<tr><td>Start</td><td>BOOL</td><td>Start of read job</td></tr>
<tr><td>ReadWrite</td><td>BOOL</td><td>Type of job<br>0 = read, 1 = write</td></tr>
<tr><td>LAddr</td><td>HW-IO/INT</td><td>Hardware ID/address of axis or drive</td></tr>
<tr><td>ParaNo</td><td>INT</td><td>Parameter number [parameter 2132 = warning message]</td></tr>
<tr><td>Value Write</td><td>REAL</td><td>Value of parameter</td></tr>
<tr><td>AxisNO</td><td>INT</td><td>Axis number/axis ID for system with multiple axes</td></tr>
<tr><td>ValueRead</td><td>REAL</td><td>Value of read parameter</td></tr>
</table>


</td></tr>
</table>

# 5.4 Setting the IP address on the PC station

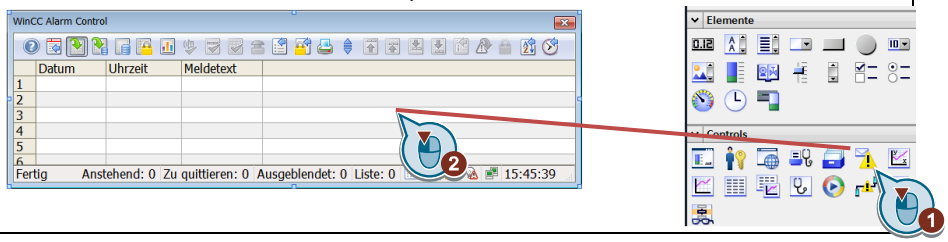
Table 5-3

| No. | Action |
|---|---|
| 1. | Add a PC system to your project.<br>  |
| 2. | Select WinCC RT Professional as the HMI application.<br>  |

| No. | Action |
|---|---|
| 3 | Add a communications module.<br>  |
| 4. | Assign a subnet to your PC system. Assign an IP address and a subnet mask in the same network as your frequency converter.<br>  |
| 5. | Configure an HMI connection to the S7 controller.<br>  |

# 5.5 Configuring the alarm view

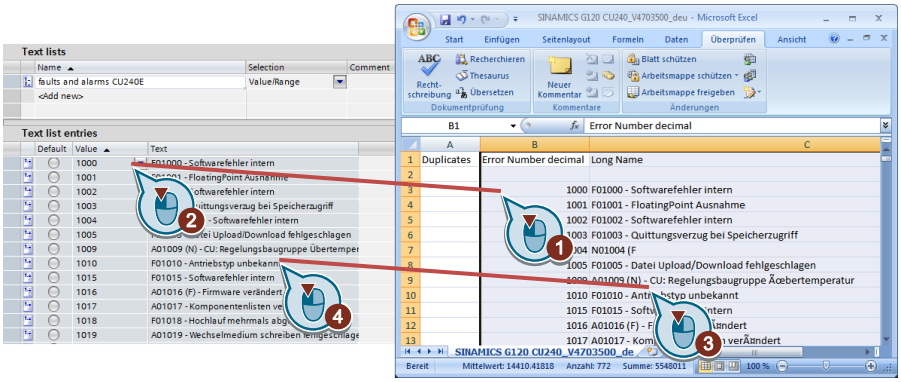
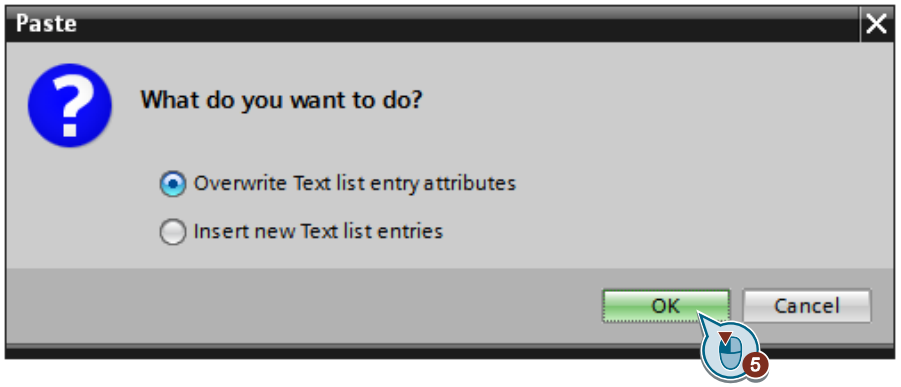
Table 5-4

| No. | Action |
|---|---|
| 1. | Insert an “alarm view” into the desired screen in order to display the messages on the HMI. To insert an “alarm view”, use drag and drop to move the alarm view from the “Tools” task card in the “Controls” palette to the screen.<br>  |

# 5.6 Generating a text list with the SINAMICS XML Parser

In Industry Online Support, you will find an XML file that contains fault and warning messages for your drive component and firmware. For the SINAMICS Control Unit CU240E-2 PN-F firmware version 4.7 described in the application example, the fault and warning messages can be found at the following Entry ID link: 92554110. With the aid of the XML Parser tool, the XML file can be converted to Excel. The following section shows you how to convert the faults and warnings to Excel for a CU240E-2 PN-F.

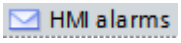
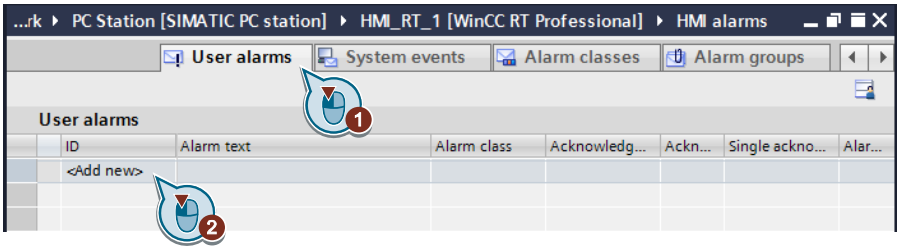
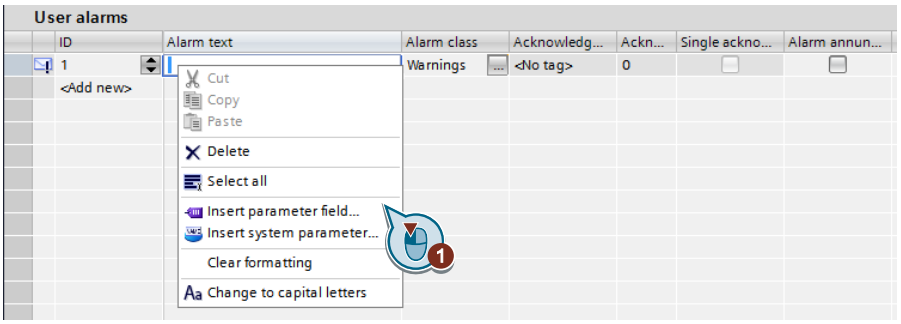
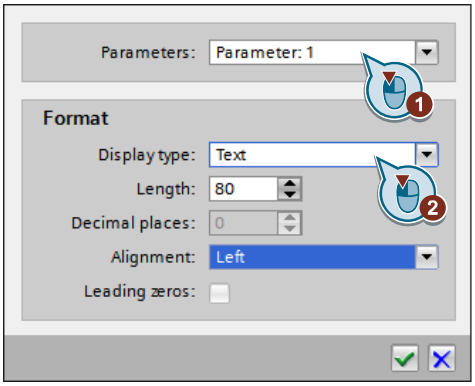
Table 5-5

| No. | Action |
|---|---|
| 1. | Download the fault and warning messages for your SINAMICS Control Unit with its firmware version from Industry Online Support to your computer. |
| 2. | Use the XML parser to generate an Excel spreadsheet with fault and warning messages. For detailed information on the XML parser, please refer to the following Entry ID: 77467239 |
| 3. | Generate a text list for the drive's fault and warning messages.<br>  |
| 4. | Copy, column by column, the fault and warning messages to the newly created text list as a value and as text.<br>  <br>When copying the columns, you will be prompted to overwrite them. Click the button.<br>  |

## 5.7 Configuring a user alarm

In the project, a user alarm is configured with the aid of a script: Using the SINA block, the error and warning messages of the SINAMICS are read from the PLC. With the aid of the “LookupText” function, the error number is linked to the configured error texts from the text list and displayed in the alarm view. For more information on how to configure messages and alarms in WinCC (TIA Portal), please refer to Entry ID: 62121503

Table 5-6

| No. | Action |
|---|---|
| 1. | In the project tree, open HMI alarms.<br>  |
| 2. | Open the “User alarms” tab.<br>Add a new user alarm.<br>  |
| 3. | Open the “Insert parameter field...” tab.<br>  |
| 4. | Select a parameter. In Display type, select “Text”.<br>  |

<table>
<tr><th>No.</th><th>Action</th></tr>
<tr><td>5.</td><td>Configure the following actions to a button.<br><br>Pressing the button sets the “StartWarningMessage” tag to true. This executes the SINA_PARA_S block that returns the drive’s current warning number.<br> 
<br>Releasing the button starts the “EAWarning” script that, with the aid of the text list, converts the current error number to error text.<br> 
</td></tr>
<tr><td>6.</td><td>Create the following script.<br><br>The script checks the SINA_PARA_S block’s warning number. As soon as the warning number is 0, the drive is OK. If the number is not 0, a user alarm is called. To this end, the current warning number is linked to the text list using the “LookupText” command and then displayed in the alarm view.

```
1
2
3  Sub EAWarning()
4
5  'Check warning message is active
6  If SmartTags("ReadWarningNumber") = 0 Then
7  HMIRuntime.Trace "Drive OK" & vbLf
8  Else
9
10 'Read actual language
11 Dim language
12 language = HMIRuntime.Language
13 SmartTags("HMILanguage") = language
14
15 'German text 1031
16 If language = 1031 Then
17 LookupText "warningtext", "ReadWarningNumber", "de-DE", "faults_and_erros"
18 End If
19
20 'Englisch text 1033
21 If language = 1033 Then
22 LookupText "warningtext", "ReadWarningNumber", "en-US", "faults_and_erros"
23 End If
24
25 'Create User Alarm
26 If (language = 1033 Or language = 1031) Then
27 Dim userAlarm
28 Dim ID_UA
29 Dim State_UserAlarm
30 ID_UA = "2"
31 State_UserAlarm = "1"
32 Dim text
33 text = SmartTags("warningtext")
34 Set userAlarm = HMIRuntime.Alarms(ID_UA)
35 userAlarm.State = State_UserAlarm
36 userAlarm.ProcessValues(1) = text
37 userAlarm.ProcessValues(2) = text
38 userAlarm.Create "MyApplication"
39 Else
40 HMIRuntime.Trace "Language not configured" & vbLf
41 End If
42
43
44 End If
45
46 End Sub
```
</td></tr>
<tr><td>7.</td><td>Repeat steps 1 through 6 for the error messages.</td></tr>
</table>

# 6 Operation of the Application

Before you start up the configuration, check the wiring of the components.

## 6.1 Starting up the sample project

Table 6-1

| No. | Action |
|---|---|
| 1. | Unzip the “109738320_HMI_FU_CODE_v13.zip” file. |
| 2. | Start TIA Portal. |
| 3. | Unzip the “FrequencyConverter.zap13” project. |
| 4. | Download the SIMATIC WinCC project to your PC station. |
| 5. | Download the SIMATIC Startdrive project to your frequency converter. |

## 6.2 Using the sample project

Figure 6-1

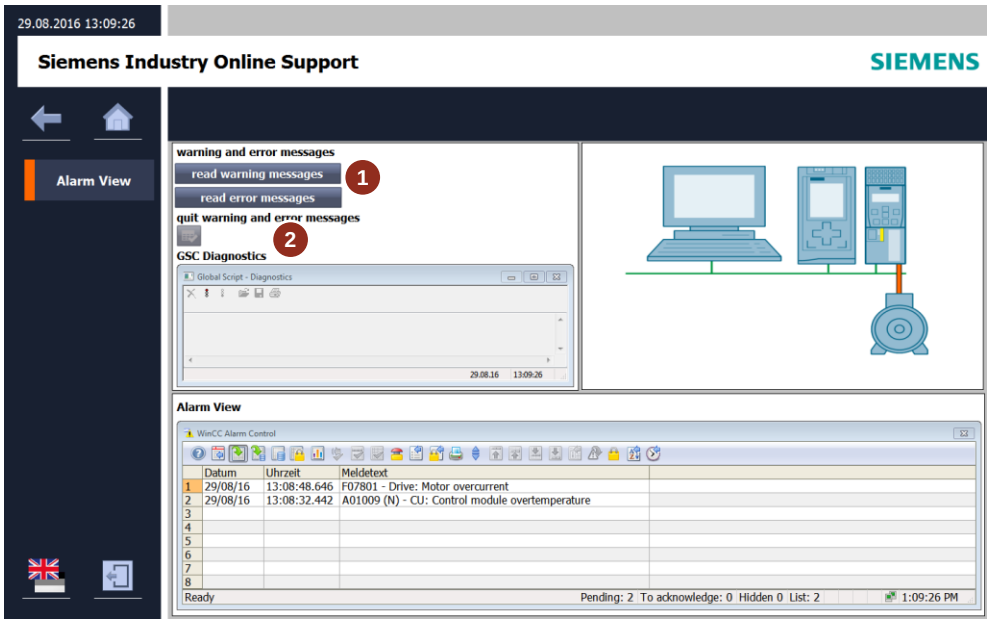


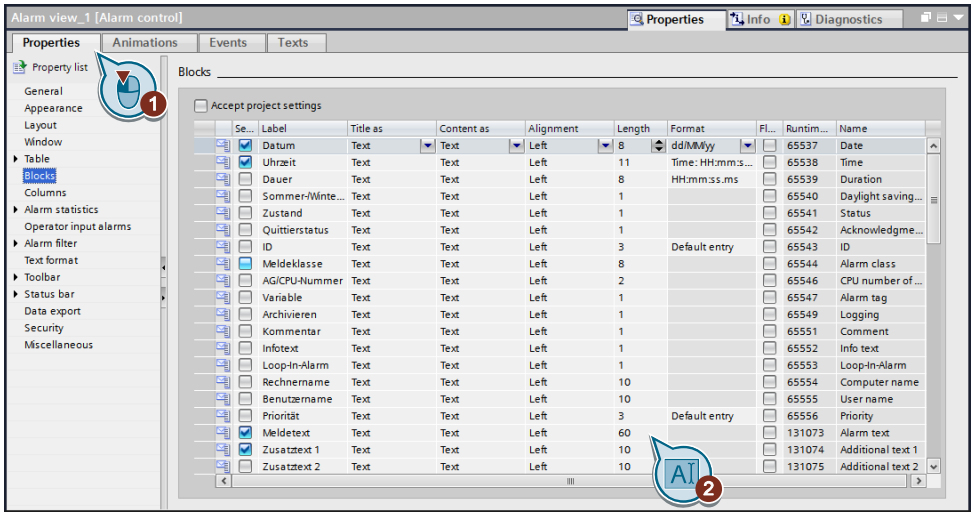

Table 6-2

| No. | Action |
|---|---|
| 1. | Two buttons allow you to read the warning and error message. |
| 2. | As soon as the faults have been set to outgoing in the drive, they can be acknowledged using the button. |

# 7 Further Notes, Tips and Tricks, etc.

## 7.1 Resizing the alarm text in the Alarm Control

In order to fully display the alarm text in the alarm view, resize the alarm text: In the control, go to Properties --> Blocks. Resize the alarm text length.




## 7.2 Drive blocks

To control the drive for speed input or positioning, you can use the technology object or the DriveLib library.

For more information, please refer to Entry ID 109475044 and Entry ID 78788716.

# 8 Links & Literature

Table 8-1

| | Topic |
|---|---|
| \1\ | Siemens Industry Online Support<br>https://support.industry.siemens.com |
| \2\ | Download page of the entry<br>https://support.industry.siemens.com/cs/ww/en/view/109738320 |
| \3\ | XML Parser<br>https://support.industry.siemens.com/cs/ww/en/view/77467239 |

# 9 History

Table 9-1

| Version | Date | Modifications |
|---|---|---|
| V1.0 | 09/2016 | First version |