FAQ – Migration of Startdrive S120 projects and firmware upgrade

Startdrive

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1 Requirements

1.1 Application

This FAQ describes the migration of a TIA Portal project, which contains a SINAMICS S120 drive projected by Startdrive from version V14 (SP1) to version V15, V15.1 or V16. It specially involves the migration of the SINAMICS S120 drives.

1.2 Distinction

The FAQ exclusively applies for SINAMICS S120 drive units projected by Startdrive V14 (SP1).

Drives attached by a GSDML file to the PLC and projected by means of STARTER, are not considered.

The FAQ does not describe the migration of other device groups, such as PLCs, HMIs or other devices.

1.3 Software requirements

To perform the migration, the tools Startdrive V14 (SP1) with S120 option and Startdrive V15, V15.1 or V16 have to be available.

1.4 Hardware requirements

For the migration a factory-set CU320-2PN with Firmware 4.8 is necessary. Other hardware components such as motor modules, line modules etc. have not to be present for the migration even if they are used in the project.

1.5 Described use cases

Migration of a S120 attached to a technology object of the PLC

This scenario describes the migration in case the S120 is attached to a technology object of an overlaid PLC.

See chapter Migration of a S120 attached to a technology object of the PLC for description.

Migration of a S120 when using the internal drive function

This scenario describes the migration in case of the usage of the internal drive function, such as the basic positioner and the control of these functions by the overlaid PLC for example by function blocks of the DriveLib.

See chapter Migration of a S120 when using the internal drive for description

Usage of PROFIsafe communication

This scenario describes the additional use of PROFIsafe. This is always possible regardless of the other scenarios.

See chapter Use of a PROFIsafe communication for description.

Upgrade of the firmware inside the project

This scenario describes an upgrade of the S120 firmware in an existing or an upgraded Startdrive V15, V15.1 or V16 project. See chapter Upgrade of the firmware in the project for description.

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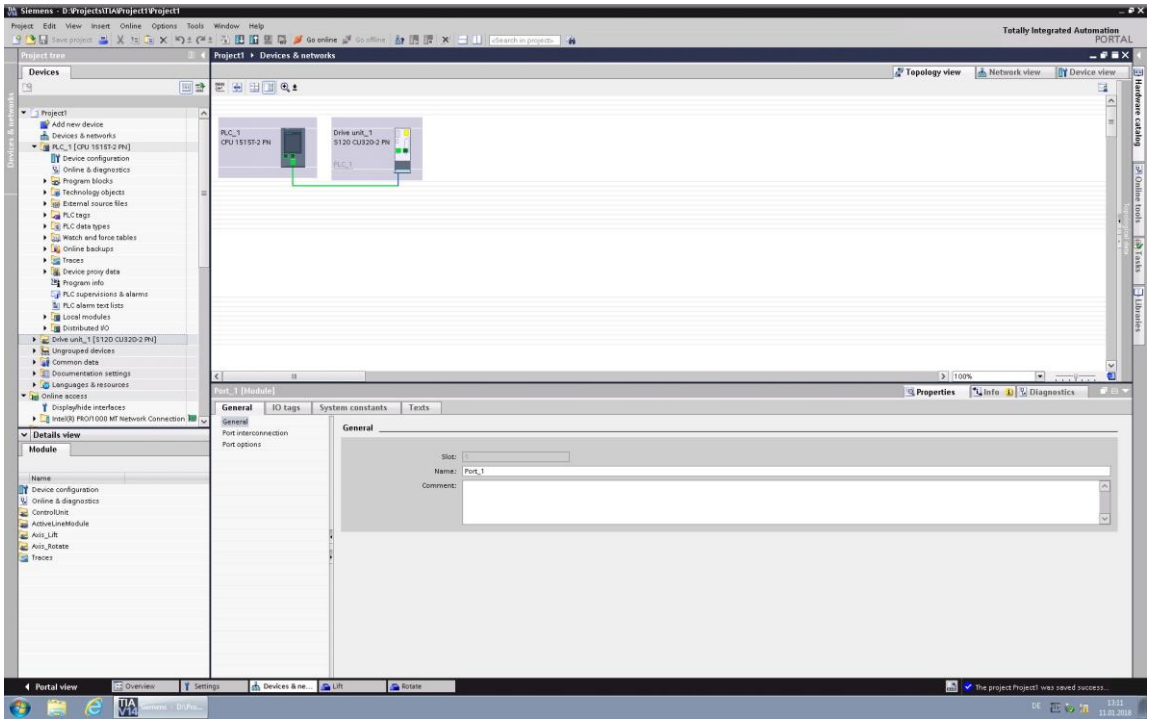
2 Migration of a S120 attached to a technology object of the PLC

2.1 Sample Setup

- A S120 drive unit which is attached to a SIMATIC S7-1515T-2 PN is projected.

Figure 2-1



- Two axes are projected inside the drive unit.
- The axes communicate using Siemens Telegram 105.

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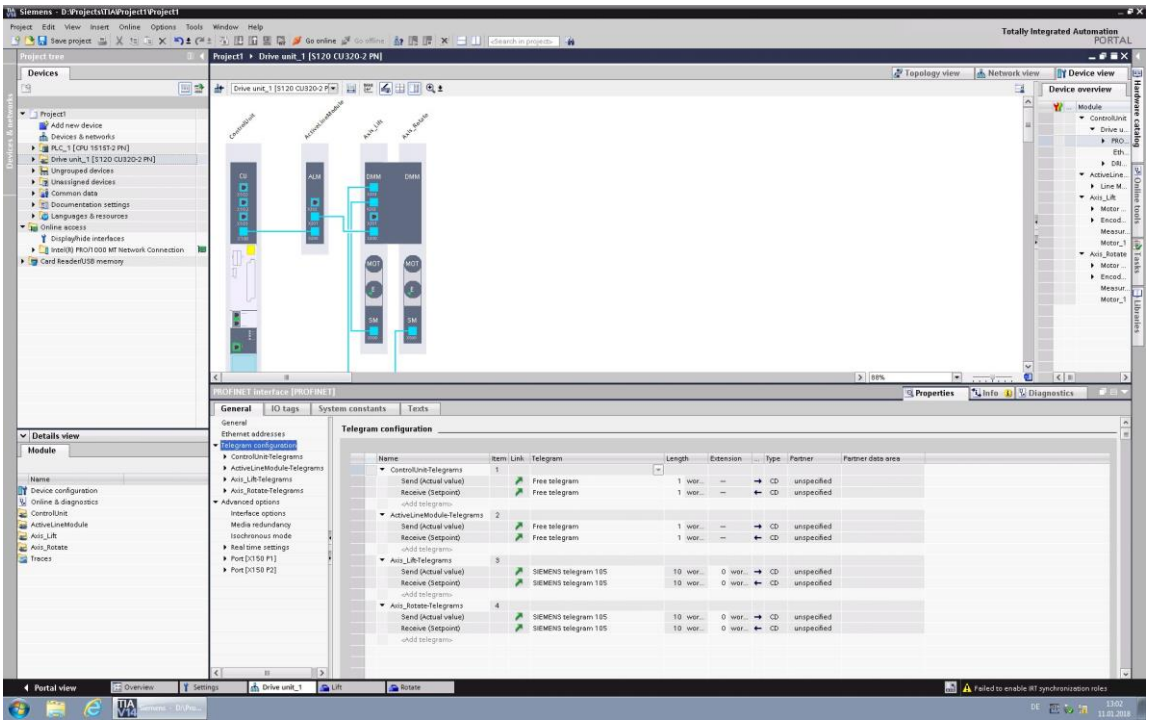
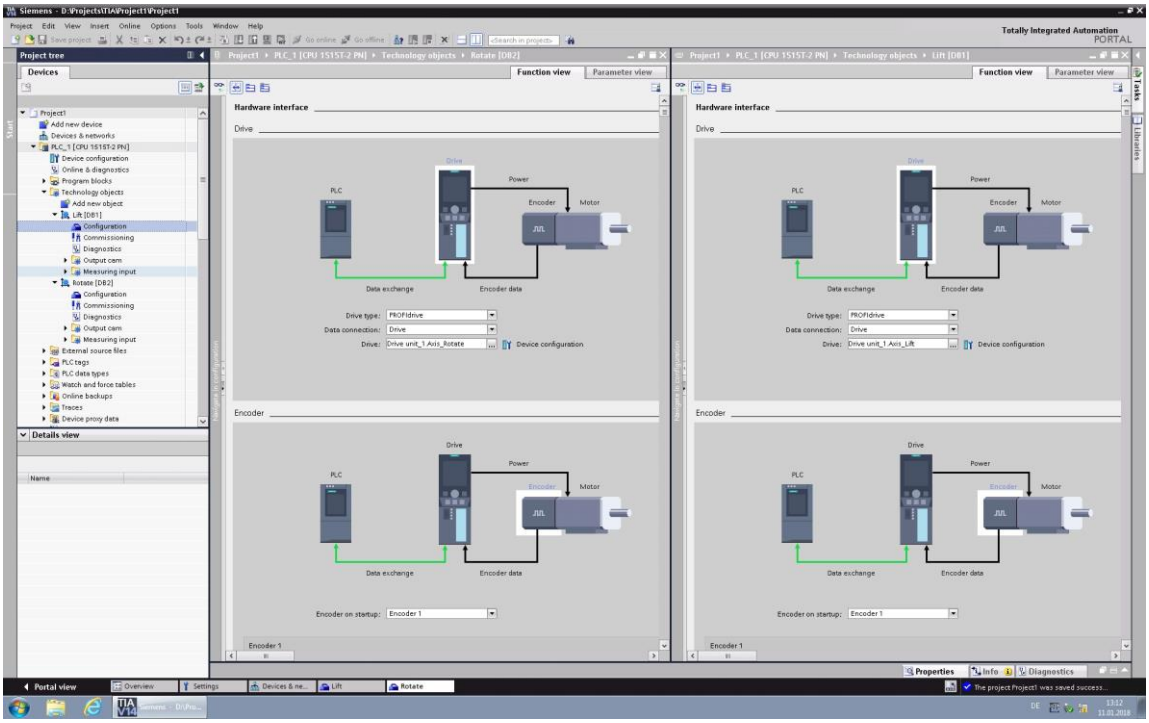
Figure 2-2



- In the PLC two technology objects are projected. The axes of the S120 are assigned to the technology objects.

Figure 2-3



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2.2 What to do?

The configuration of the drive unit is loaded from the primary project in the TIA portal V14 (SP1) to the connected Control Unit. Afterwards you have to remove the drive unit from the project and open the project in TIA portal V15, V15.1 or V16. There, a new S120 drive unit is inserted and the configuration of the connected Control Unit is uploaded to this drive unit. Afterwards the connection between the technology objects and the drives have to be restored.

2.3 Detailed description of the implementation

Preparation

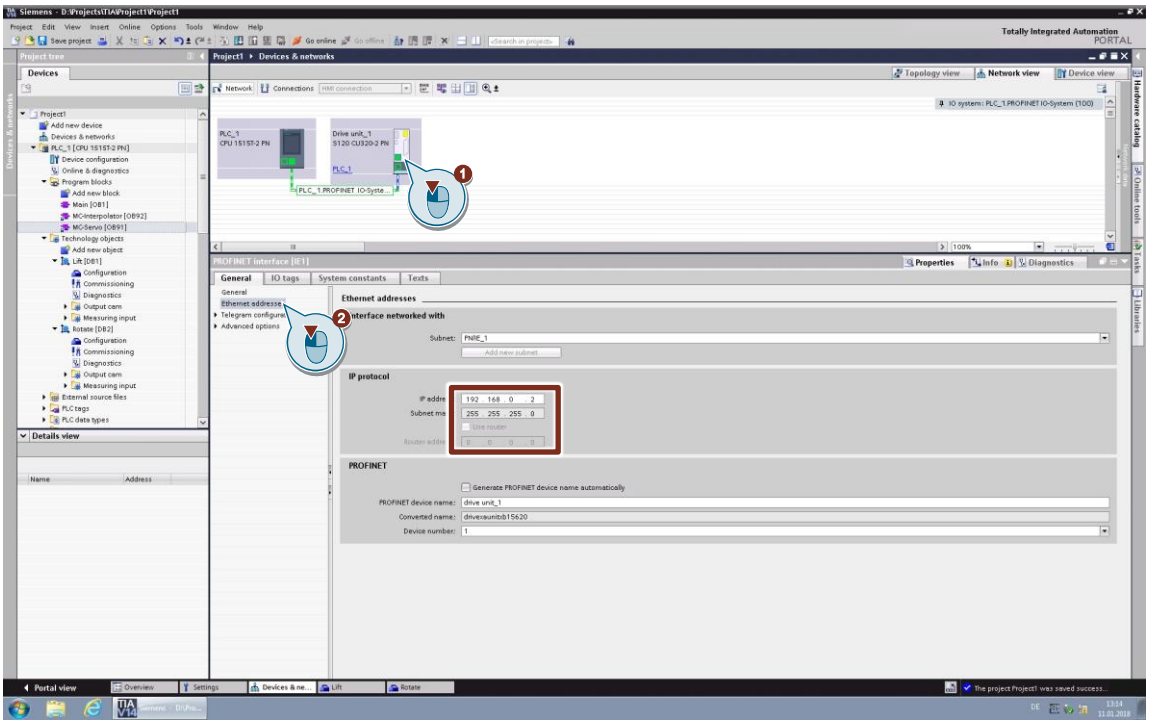
Connect a Control Unit CU320-2PN with firmware 4.8 (in factory setting) to the power supply. The CU should not be attached to any other DRIVE-CLiQ participant such as Terminal Board 30, Line Module and Motor Module etc.

Establish a connection between your computer and the X150 port of your CU via an Ethernet connection.

Necessary steps in the primary project in TIA portal V14 (SP1)

- Open the project to be migrated with the TIA portal V14.
- If there is no project archive created yet, you should archive the TIA portal project and store it as a backup.
- Check the IP address of the drive unit to be migrated. You can find the IP address in the properties of your PROFINET interface.

Figure 2-4



- Assign this IP address to the connected Control Unit. For this you have to refresh the reachable participants in the online accesses and your used adapter. The connected Control Unit is now shown. In Online & diagnostics -> Functions -> Assign IP address, you can adjust the address of the CU.

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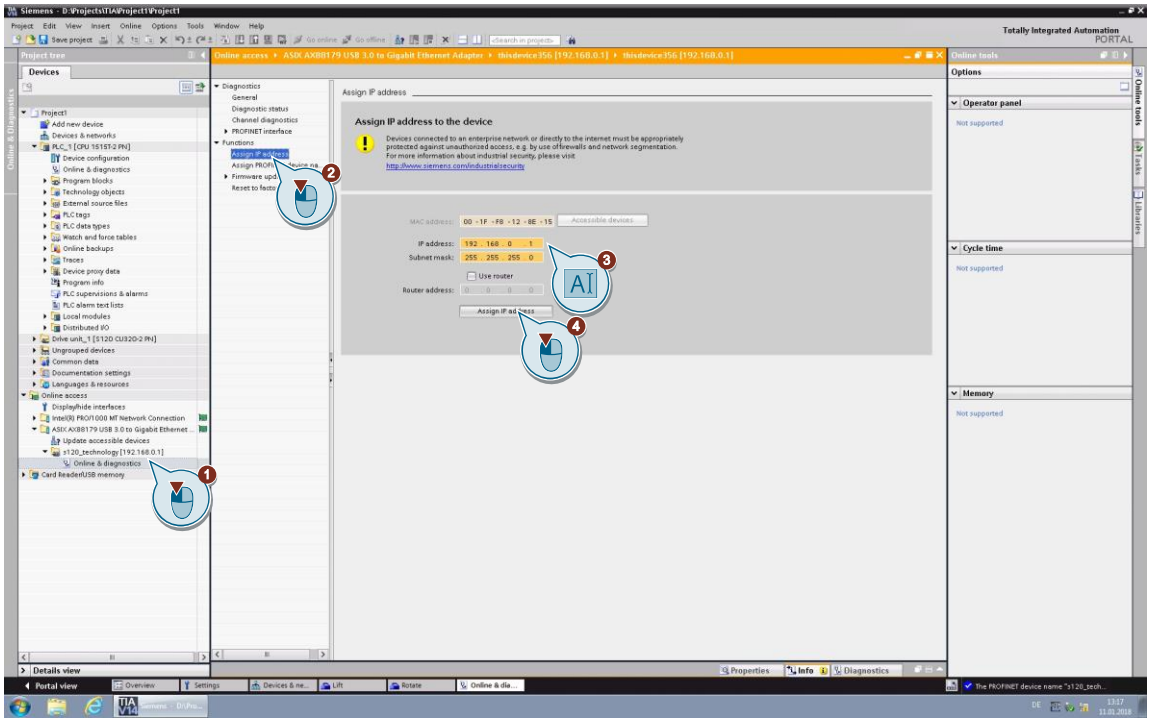
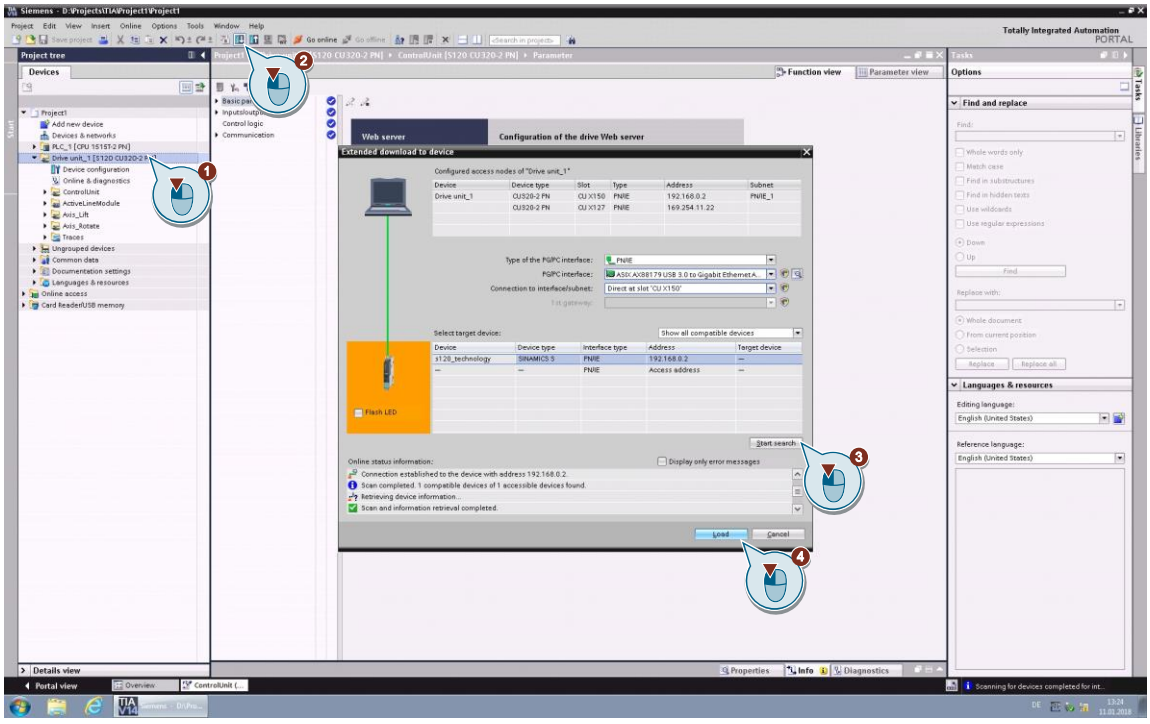
Figure 2-5



- Load the configuration of the drive unit in the connected Control Unit. To do this, select the drive unit to be migrated in the project navigator (left) and click on the button "Load to device".

Figure 2-6



- After the download the connected Control Unit reports various topology errors. These error messages appear, because the components loaded in the drives are not connected to the Control Unit, this means they are not present. You

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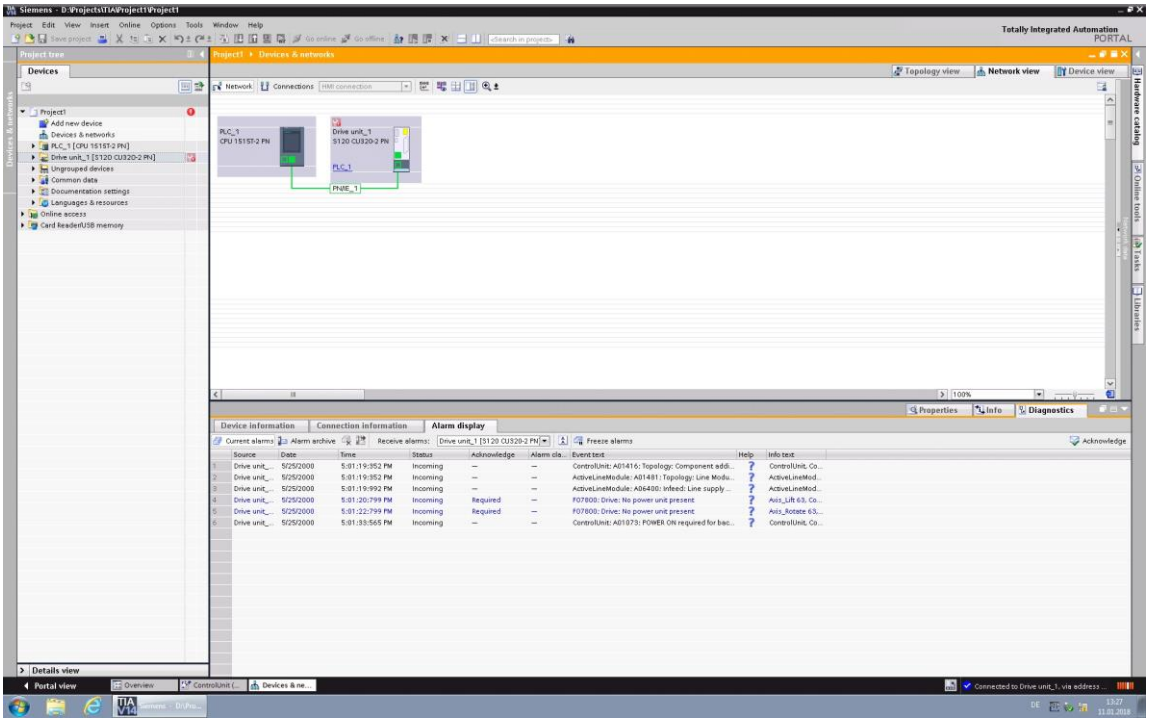
can ignore these reports. The configuration was completely loaded and taken over to the Control Unit.

Figure 2-7



- Separate the online connection to the drive units.
- Delete the drive unit from the project. Click the right mouse button on the drive unit in the project navigator and select the context menu "Delete“.

Figure 2-8

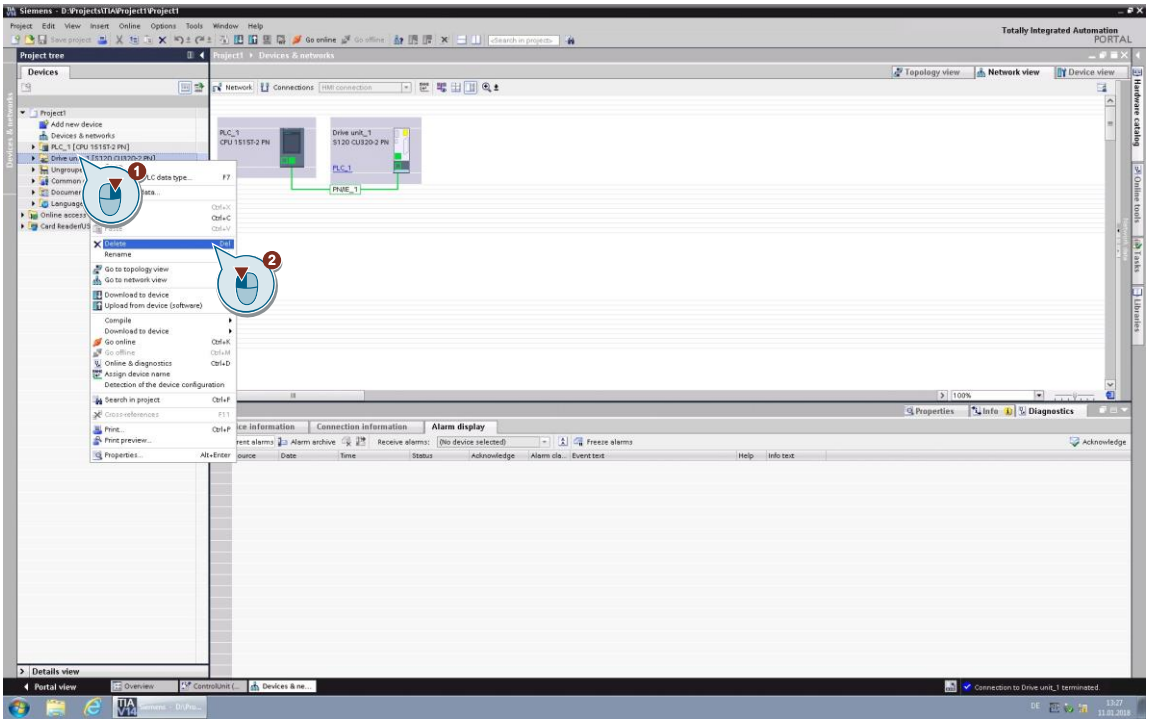


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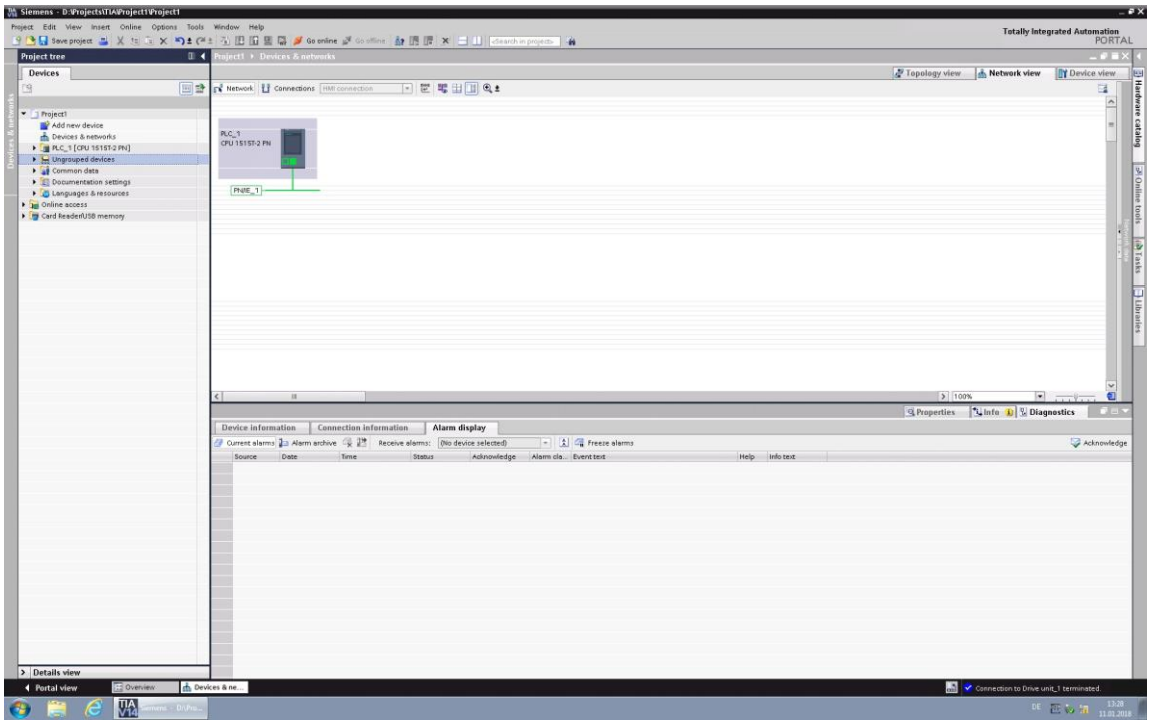
Figure 2-9



- Save the project and close TIA portal V14 (SP1).

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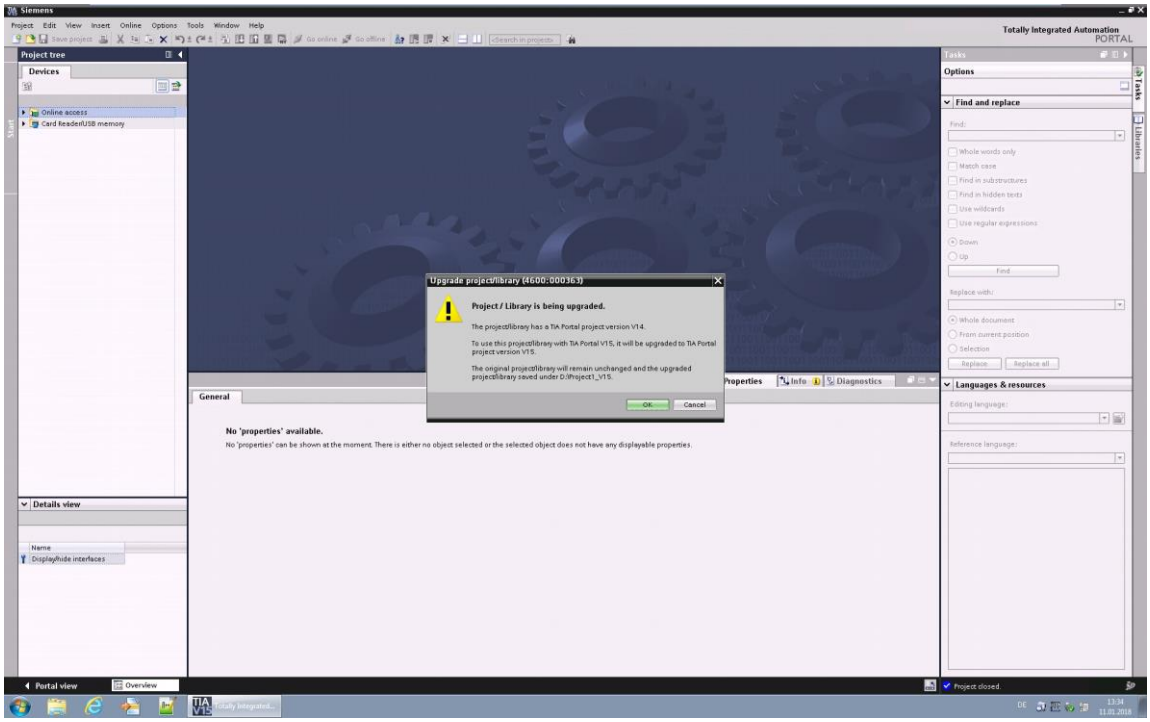
Necessary steps in the project in Startdrive V15, V15.1 or V16

Launch TIA Portal V15, V15.1 or V16 and open the saved project. It is automatically upgraded by request. You have to agree the upgrade.

Figure 2-10



- The project only contains the PLC configuration.

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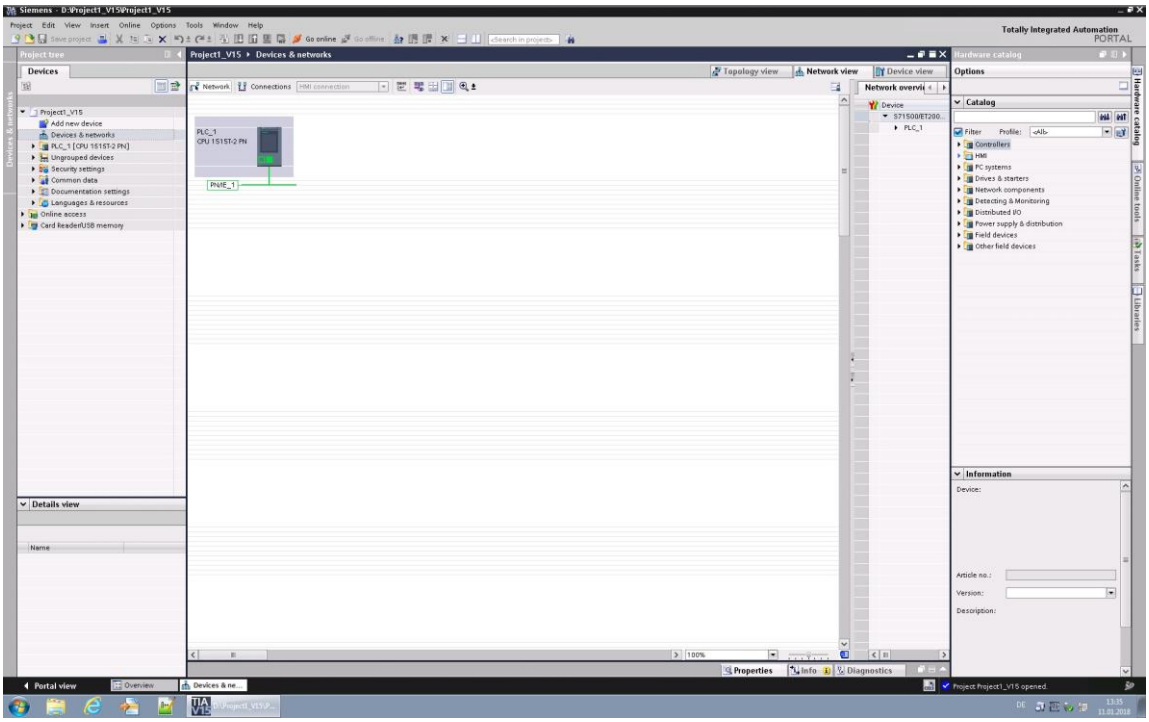
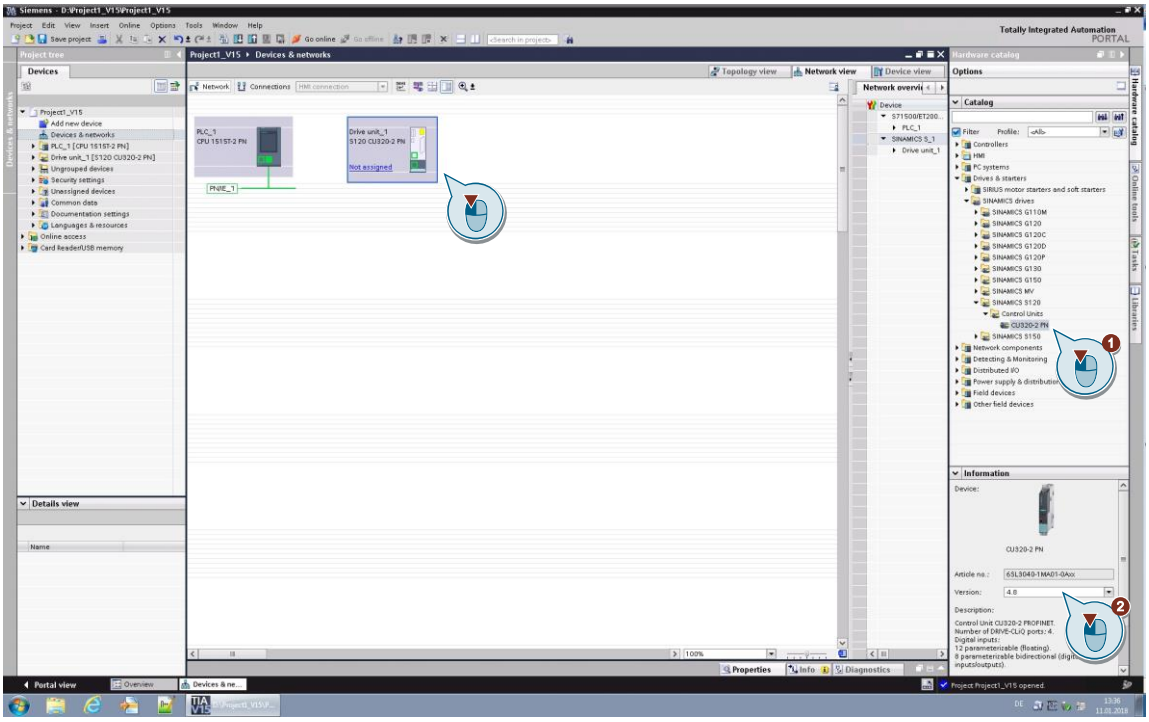
Figure 2-11



- Add a new CU320-2PN with firmware 4.8 to your project.
- (A further possibility is to upload the drive directly from the list of accessible devices. In this case the upload of the drive configuration is done automatically as well.)

Figure 2-12



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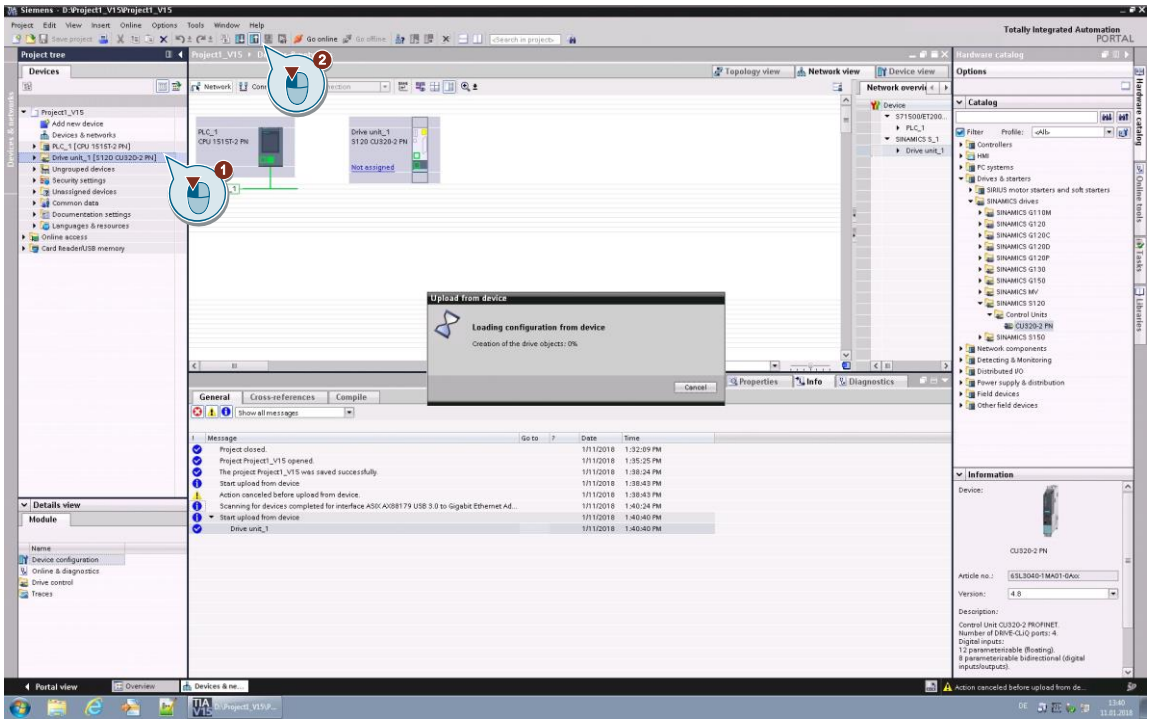
- In the next step, the configuration of the connected Control Unit is loaded in the not projected, new added drive unit. For this you have to select the drive unit in the project explorer and press the button “Upload from device”.

Figure 2-13



- The configuration is now loaded and taken over to the project.
- Check the configuration in the device view of the drive unit.
- All DRIVE-CLiQ participants and their parameterization should successfully be taken over to the project.

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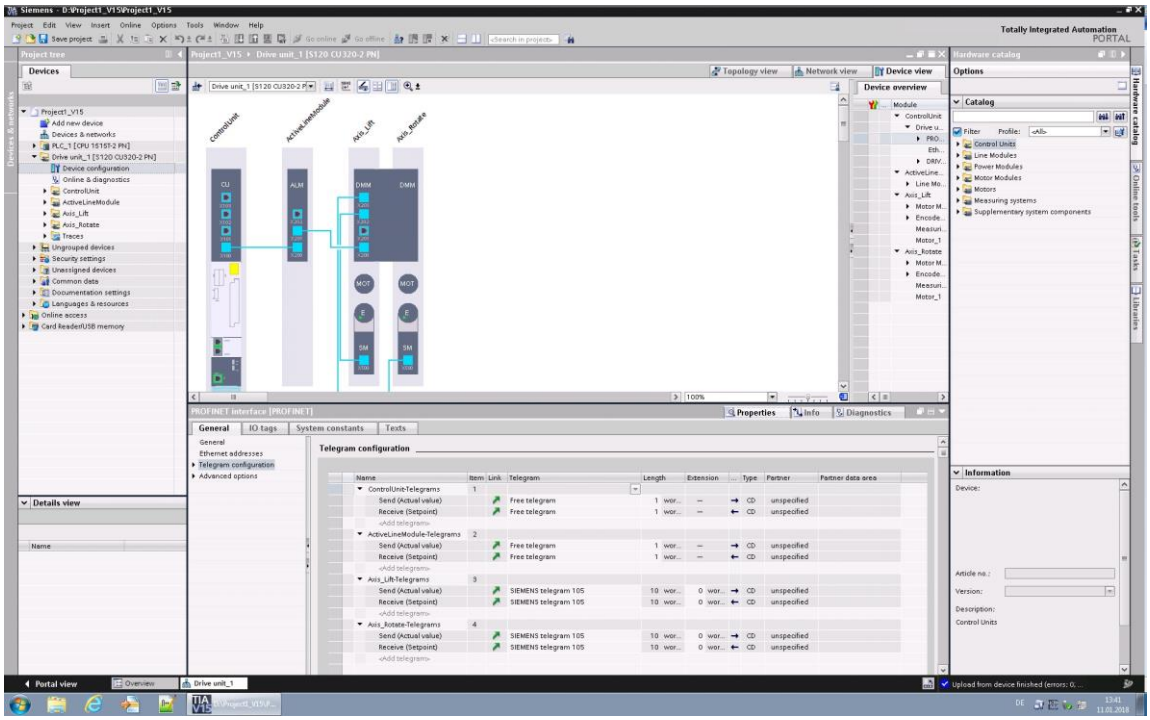
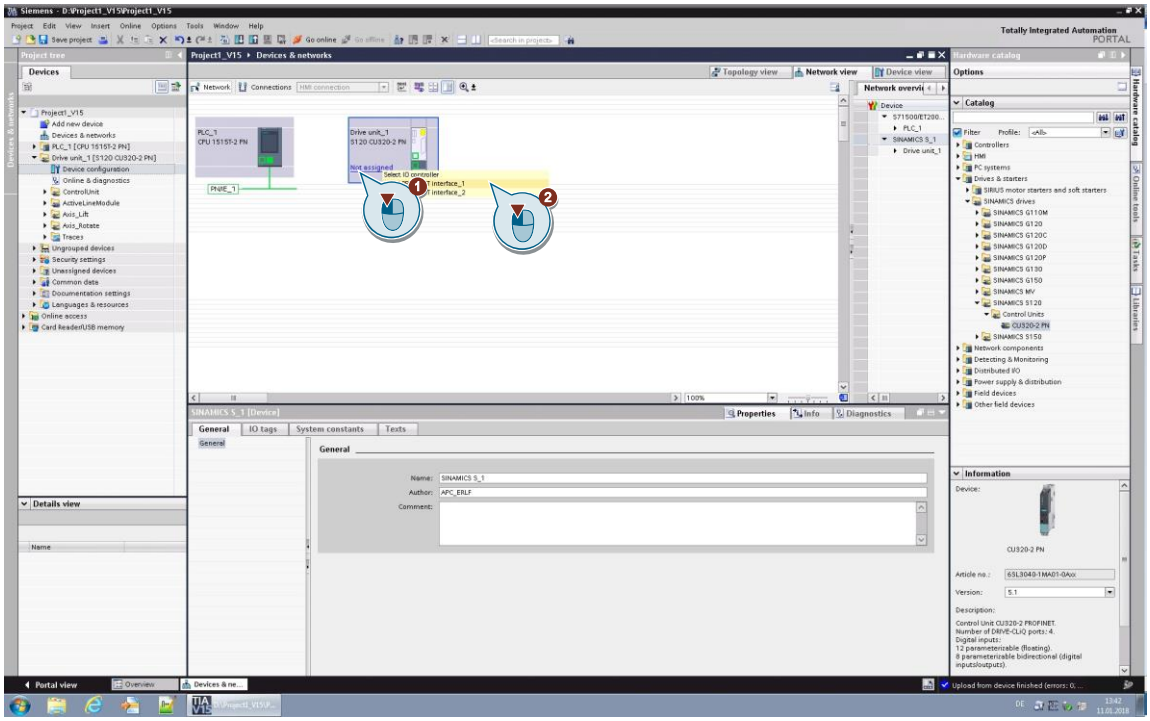
Figure 2-14



- Assign the drive unit in the network view to the PLC again. To do this, click the left mouse button on the blue "Not assigned" tag and select the appropriate interface of the PLC.

Figure 2-15



- The drive unit is now reassigned to the PLC.

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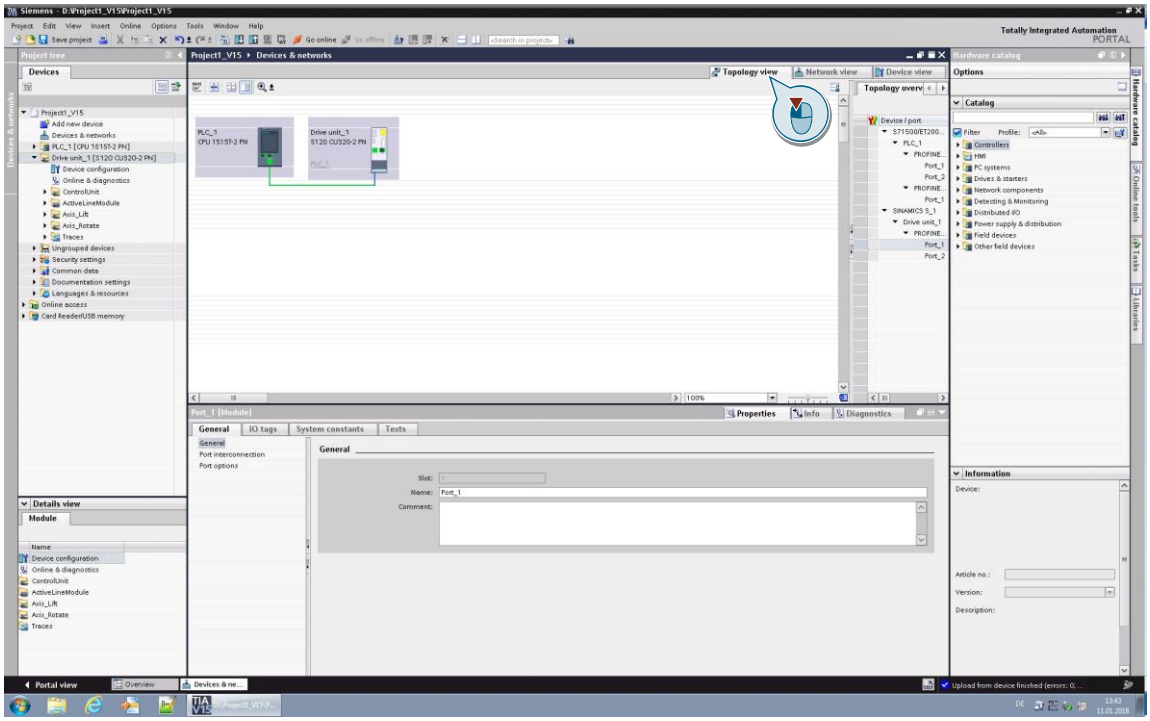
- Now you have to wire the topology view as previously configured in the original project.

Figure 2-16



- Finally, the drive axes have to be assigned to the technology objects of the PLC. To do this, go to the "Configuration" mask of the technology object and select the corresponding axis in the "Hardware interface".

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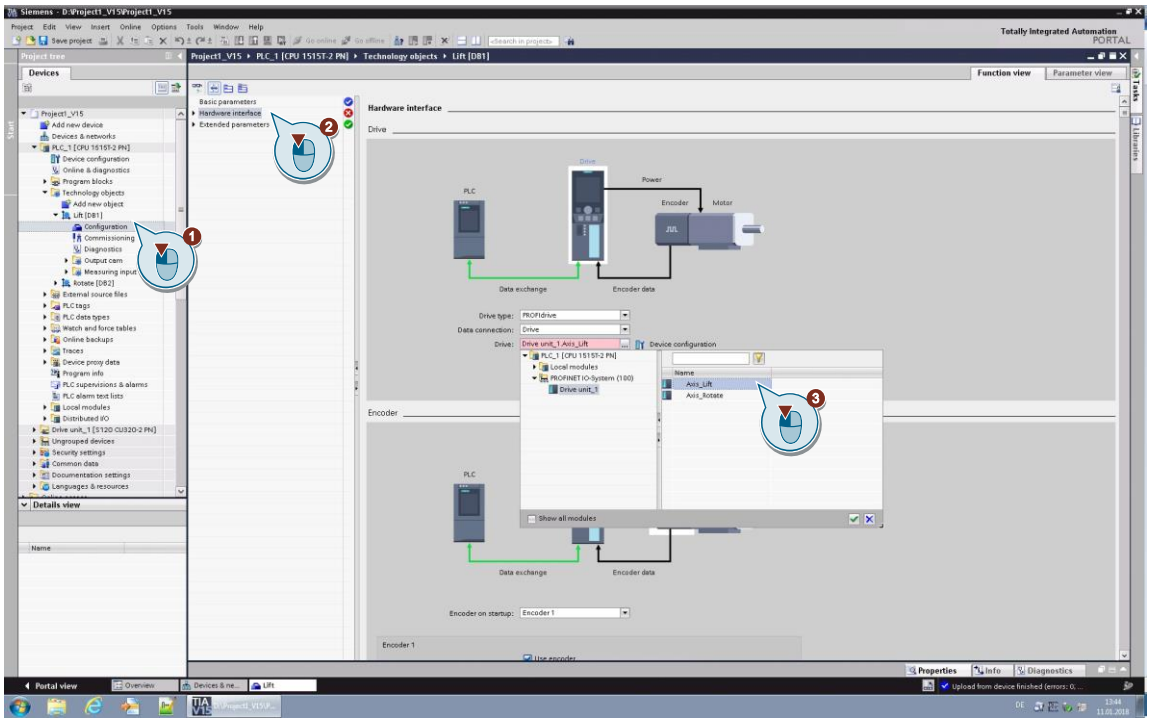
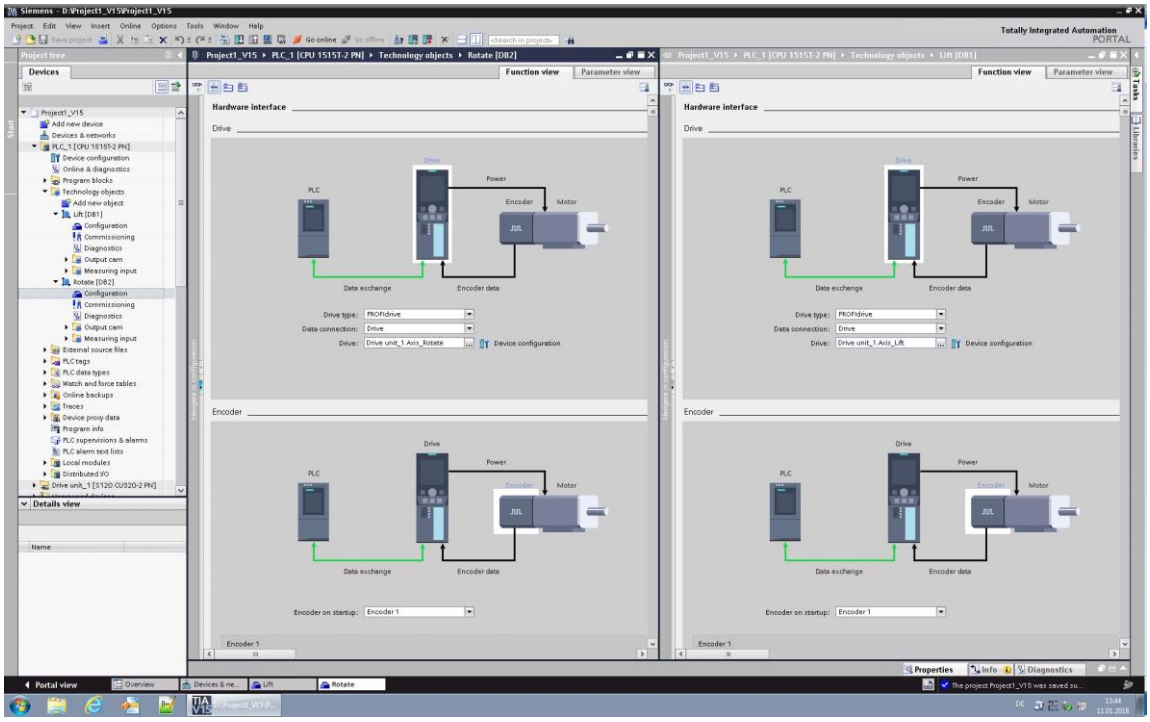
Figure 2-17



- Repeat the assignment for all the technology objects of the PLC. Finally, all axes should be assigned to the associated technology object again.

Figure 2-18



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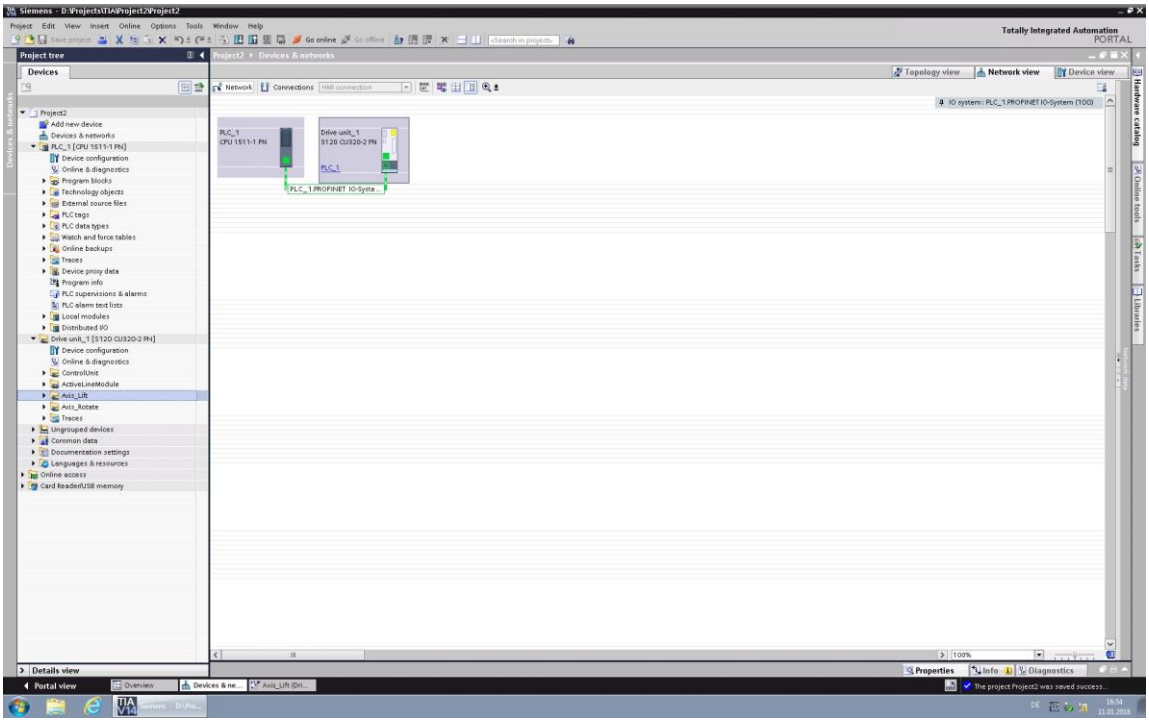
3 Migration of a S120 when using the internal drive function

3.1 Sample Setup

- A S120 drive unit is configured, if it is attached to SIMATIC S7-1511-1 PN.

Figure 3-1



- Two axes are configured in the drive unit.
- On one axis the function module basic positioner is activated. The other one is speed-controlled.
- The basic positioner axis is communicating by Telegram 111 to the PLC.
- The speed-controlled axis is communicating by Telegram 1 to the PLC.

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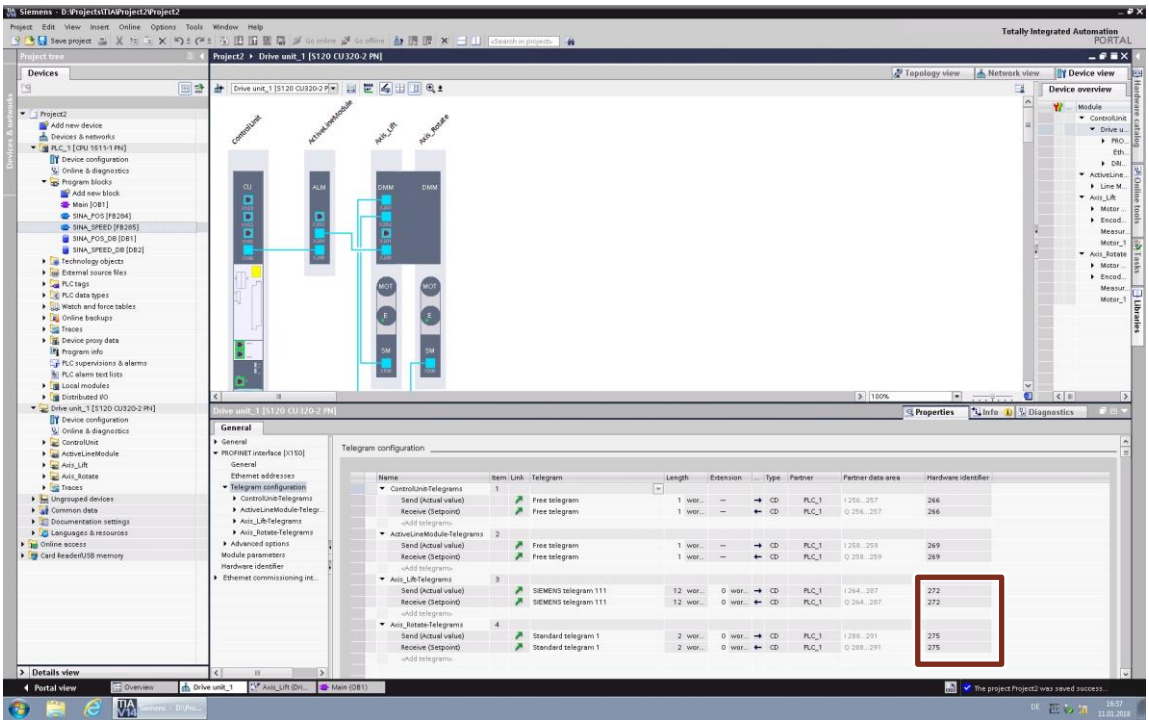
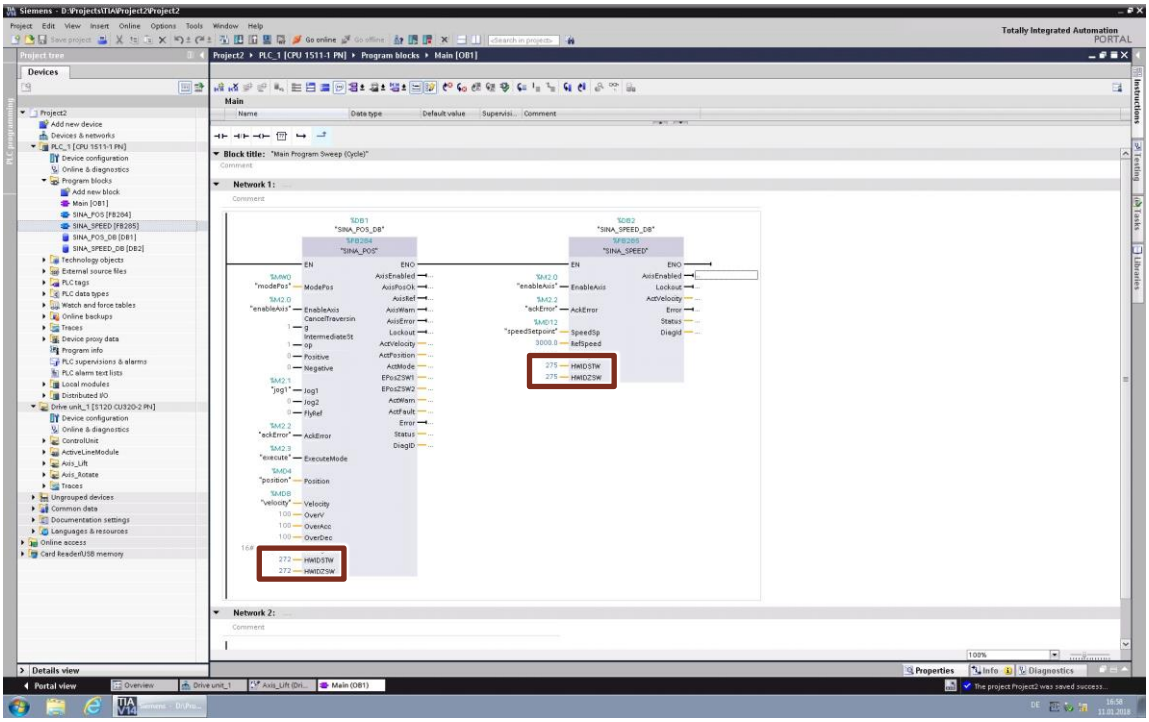
Figure 3-2



- In the PLC program, the blocks SINA_POS and SINA_SPEED from the DriveLib are used to control the axes.
- Both blocks need the hardware ID of the respective drive telegram to assign the axes.

Figure 3-3



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3.2 What to do?

The configuration of the drive unit is loaded from the primary project in the TIA portal V14 (SP1) in the connected Control Unit. Afterwards the drive unit is removed from the project and the project is opened in TIA Portal V15, V15.1 or V16. There, a new S120 drive unit is inserted and the configuration of the connected Control Unit is uploaded to this drive unit. Finally, the hardware IDs for the control blocks used in the PLC code must be checked and, if necessary, adapted.

3.3 Detailed description of the implementation

Preparation

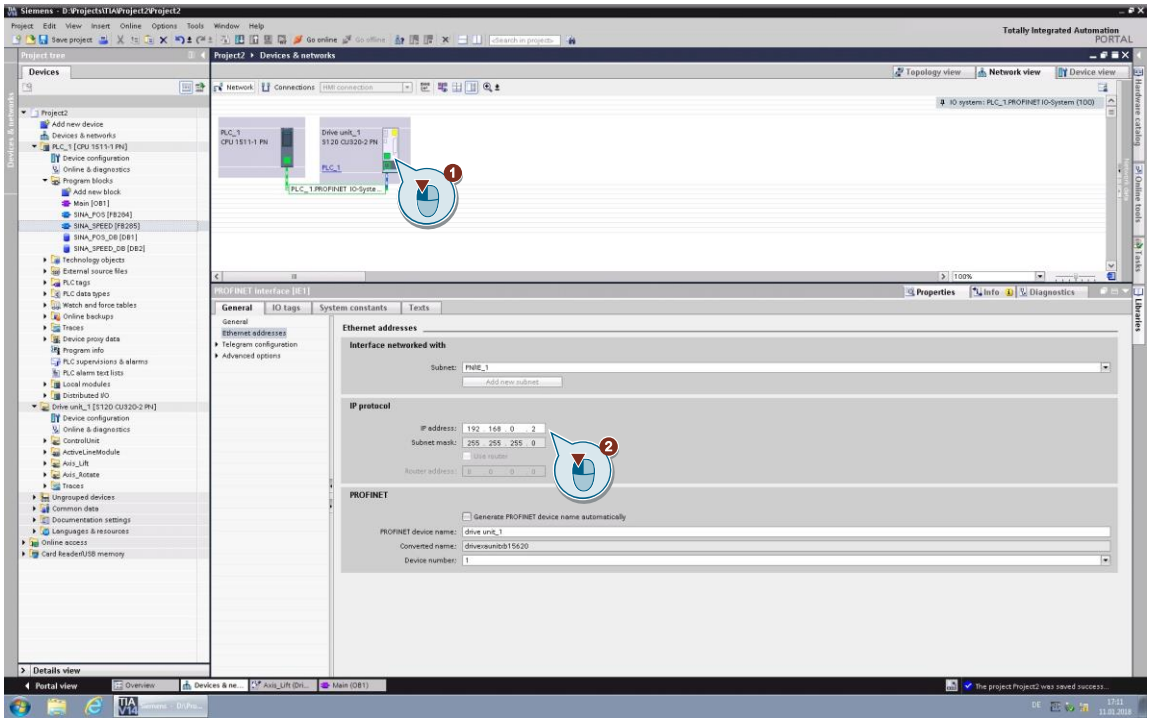
Connect a Control Unit CU320-2PN with firmware 4.8 (in factory setting) to the power supply. The CU should not be attached to any other DRIVE-CLiQ participant such as Terminal Board 30, Line Module and Motor Module etcetera.

Establish a connection between your computer and the X150 port of your CU via an Ethernet connection.

Necessary steps in the primary project in TIA portal V14 (SP1)

- Open the project to be migrated with the TIA portal V14.
- If there is no project archive created yet, you should archive the TIA portal project and store it as a backup.
- Check the IP address of the drive unit to be migrated. You can find the IP address in the properties of your PROFINET interface.

Figure 3-4



- Assign this IP address to the connected Control Unit. For this you have to refresh the reachable participants in the online accesses and your used

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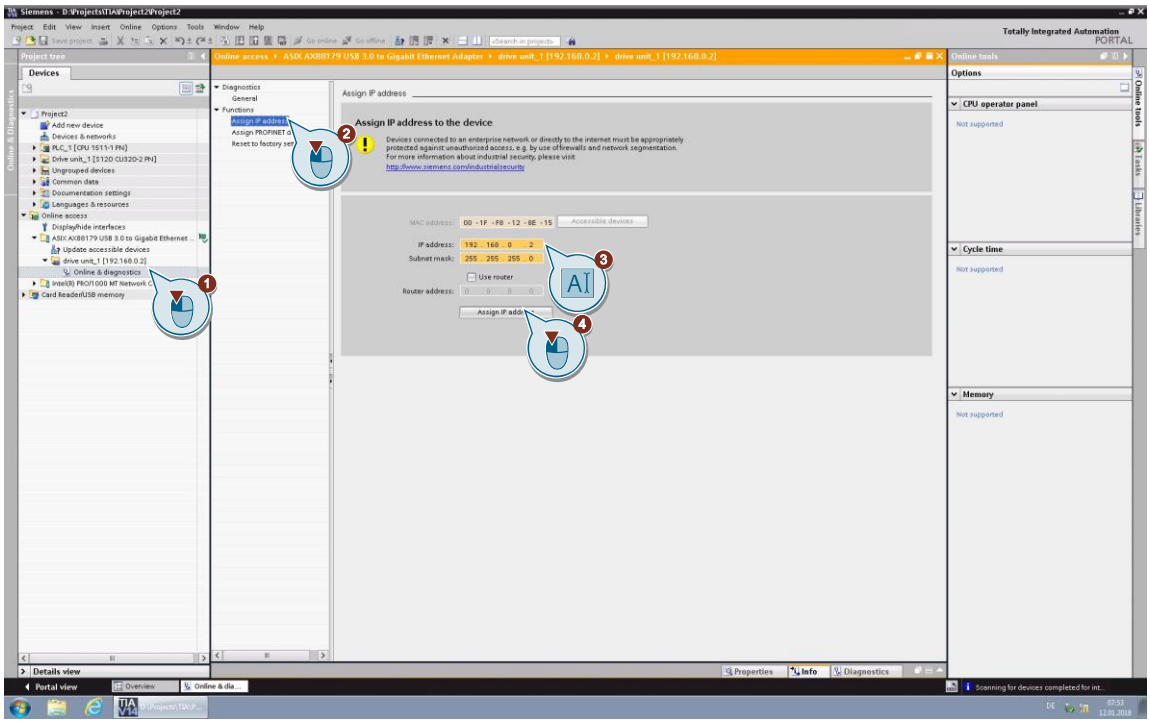
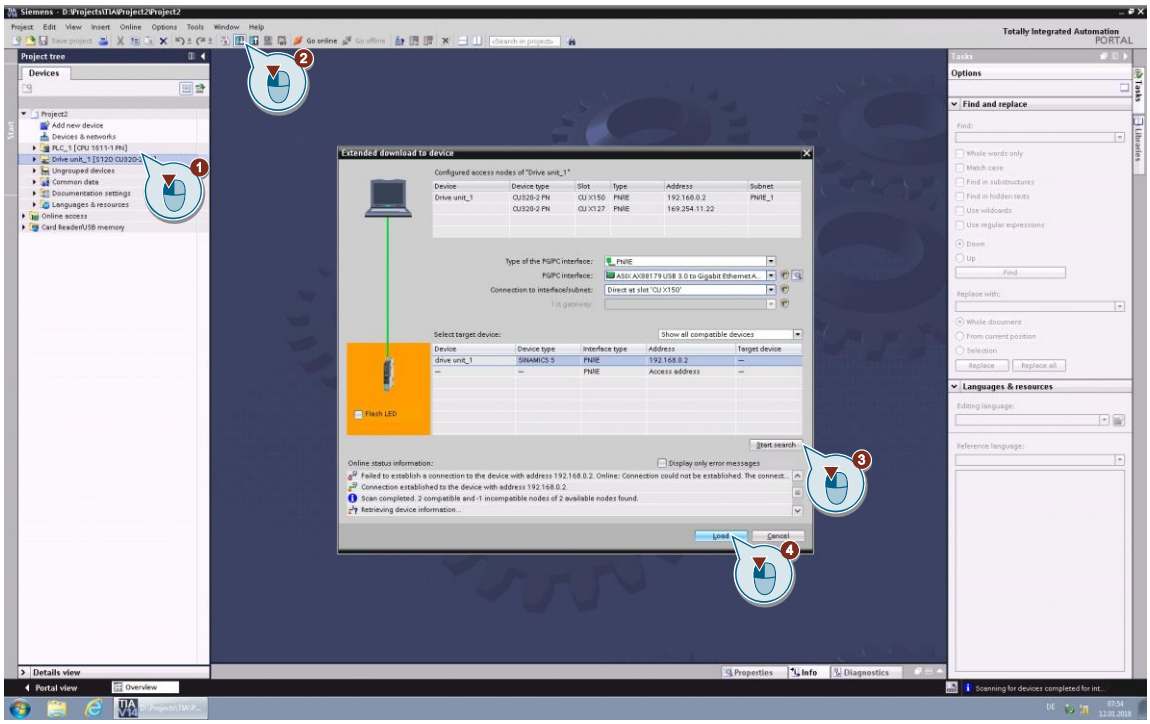
adapter. The connected Control Unit is now shown. In Online & diagnostics -> Functions -> Assign IP address, you can adjust the address of the CU.

Figure 3-5



- Load the configuration of the drive unit in the connected Control Unit. To do this, select the drive unit to be migrated in the project navigator (left) and click on the button "Download to device".

Figure 3-6



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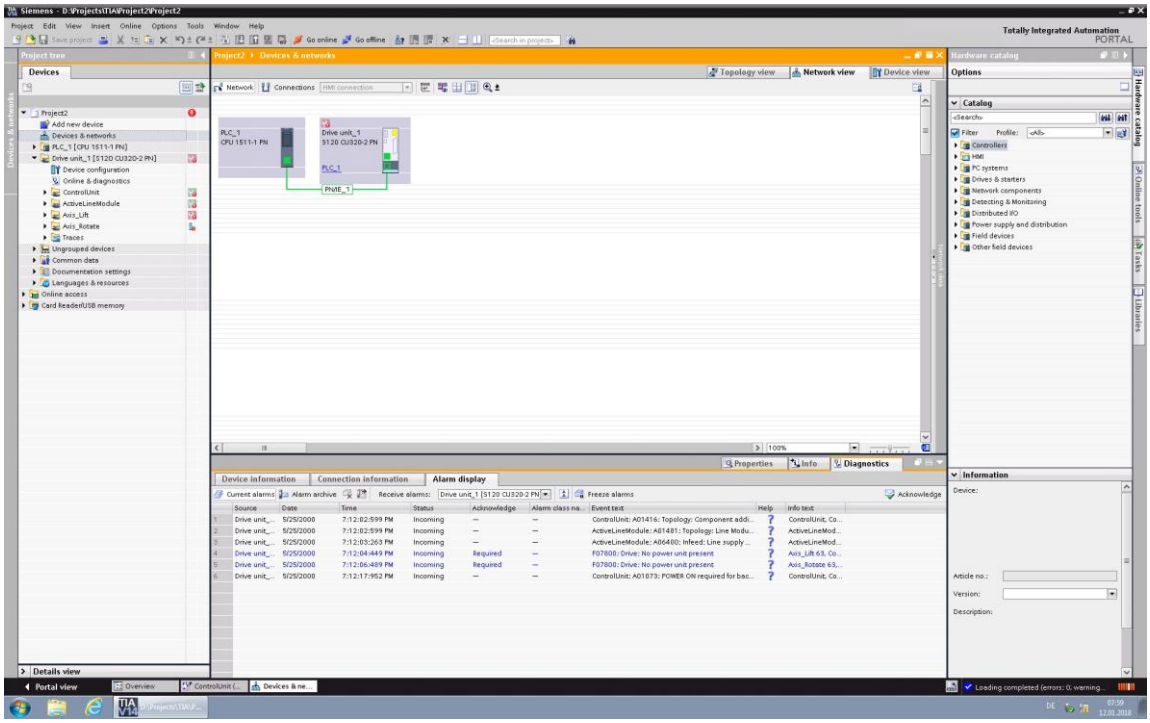
- After the download the connected Control Unit reports various topology errors. These error messages appear, because the components loaded in the drives are not connected to the Control Unit, this means they are not present. You can ignore these reports. The configuration was completely loaded and taken over to the Control Unit.

Figure 3-7



- Separate the online connection to the drive units.
- Delete the drive unit from the project. Click the right mouse button on the drive unit in the project navigator and select the context menu "Delete“.

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Figure 3-8

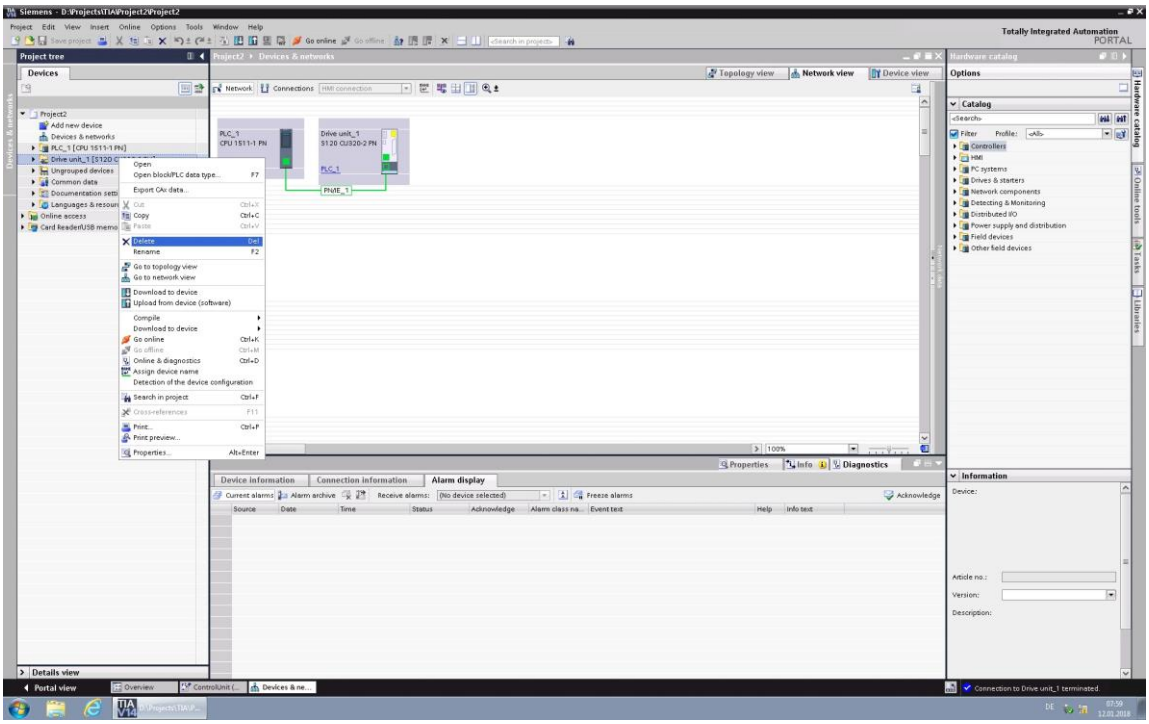
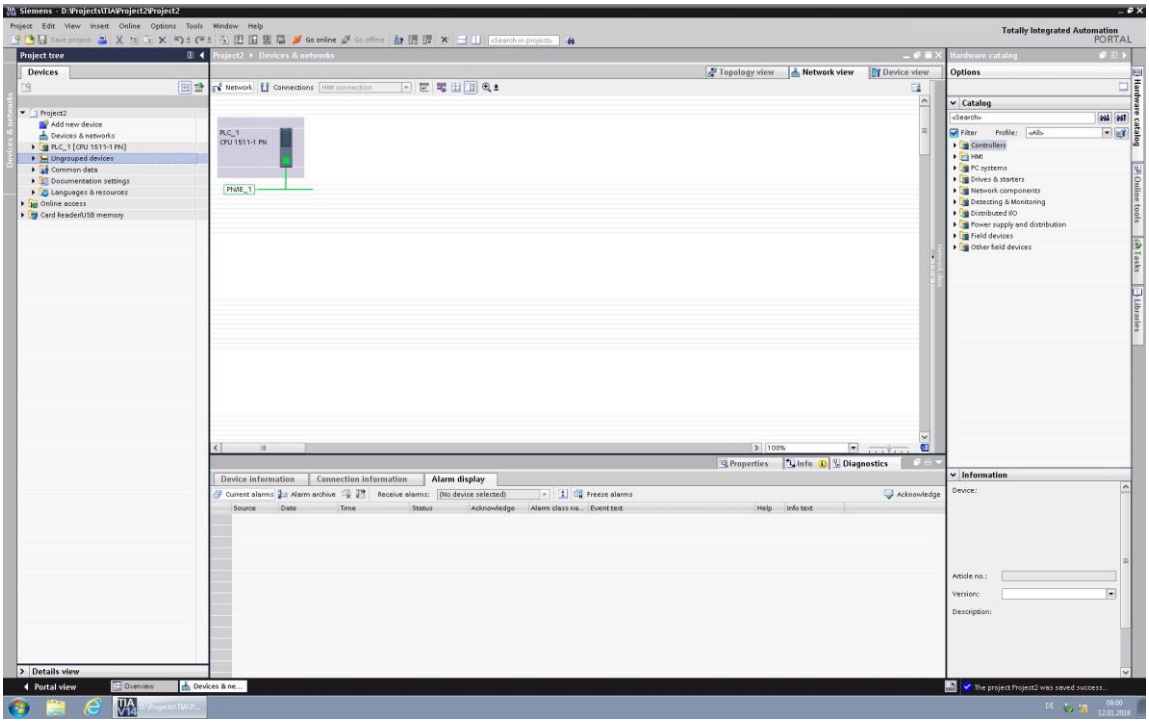


Figure 3-9



- Save the project and close TIA portal V14 (SP1).

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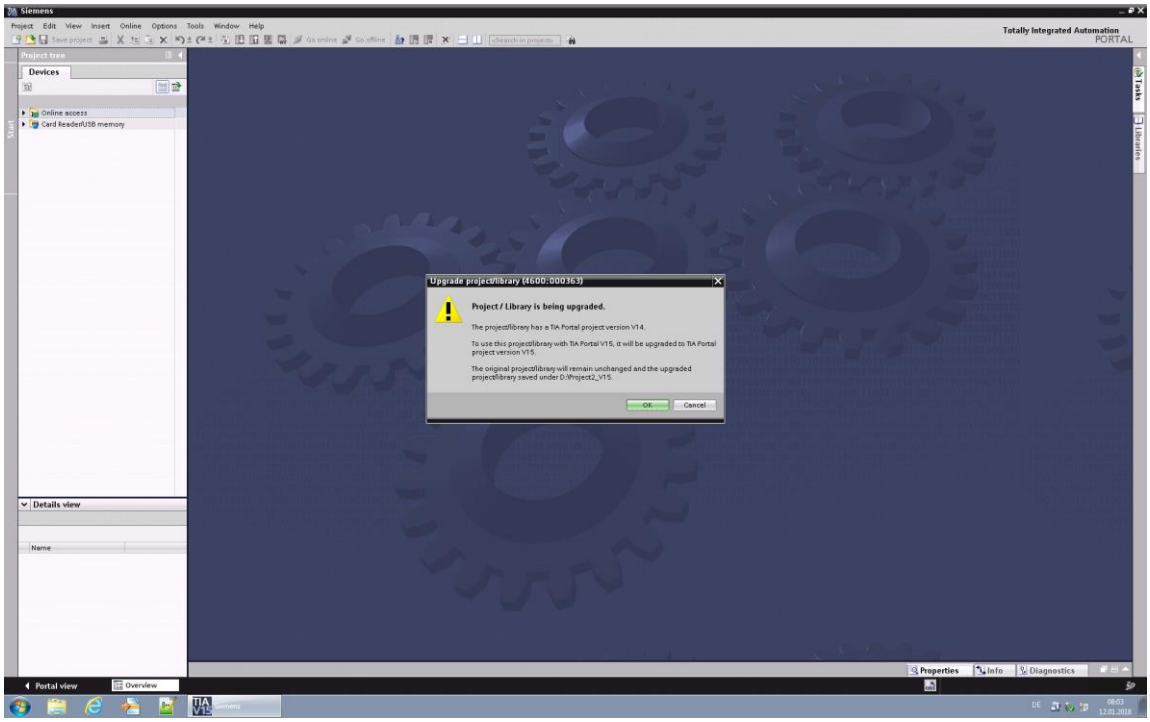
Necessary steps in the project in Startdrive V15, V15.1 or V16

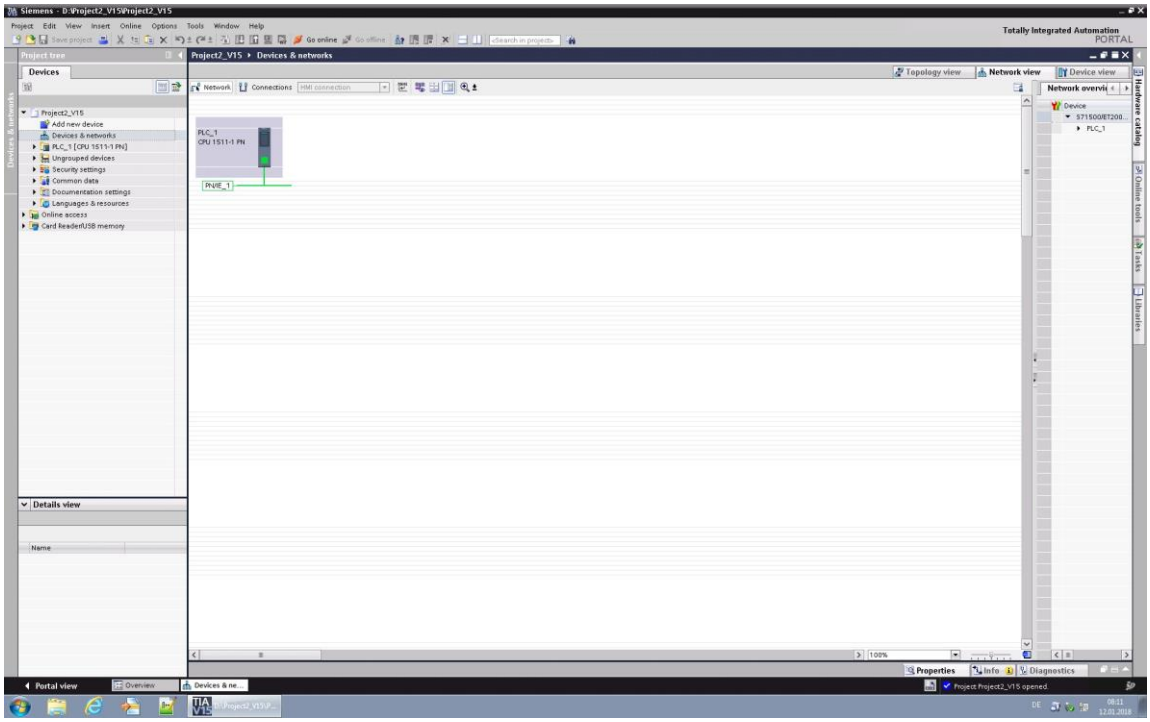
Launch TIA Portal V15, V15.1 or V16 and open the saved project. It is automatically upgraded by request. You have to agree the upgrade.

Figure 3-10



- The project only includes the PLC configuration

Figure 3-11



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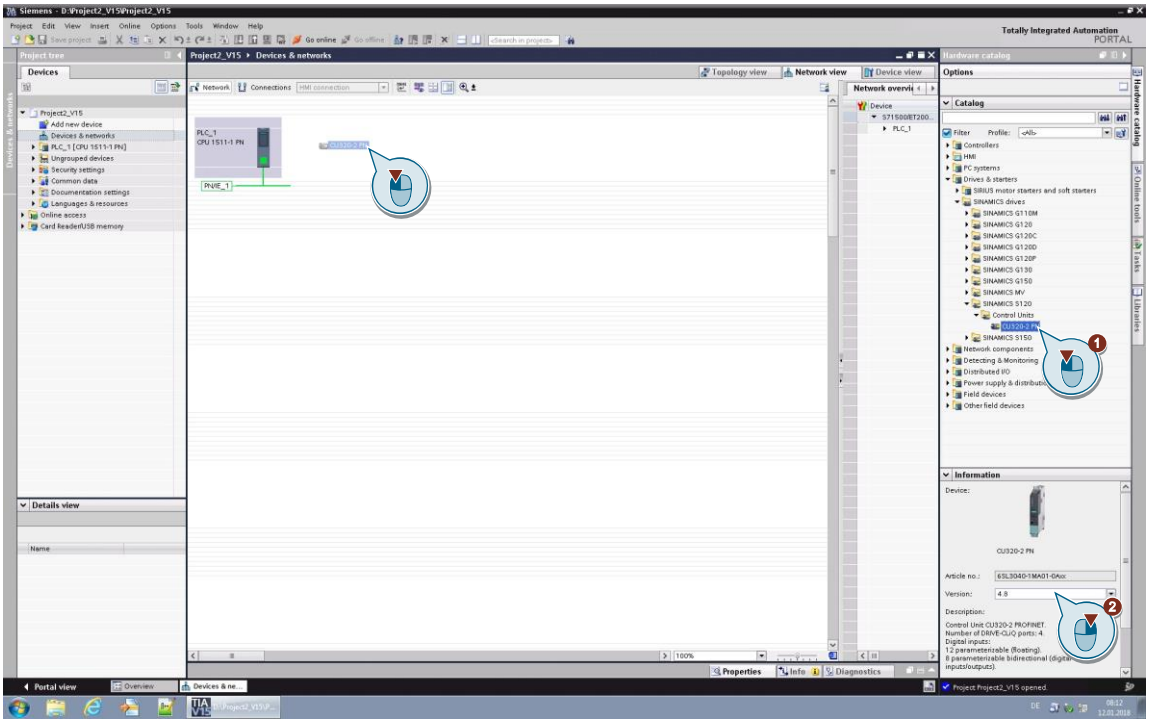
- Add a new CU320-2PN with firmware 4.8 to your project.
- (A further possibility is to upload the drive directly from the list of accessible devices. In this case the upload of the drive configuration is done automatically as well.)

Figure 3-12



- Change the IP address of the new insert device to ensure being able to get online with your connected Control Unit.

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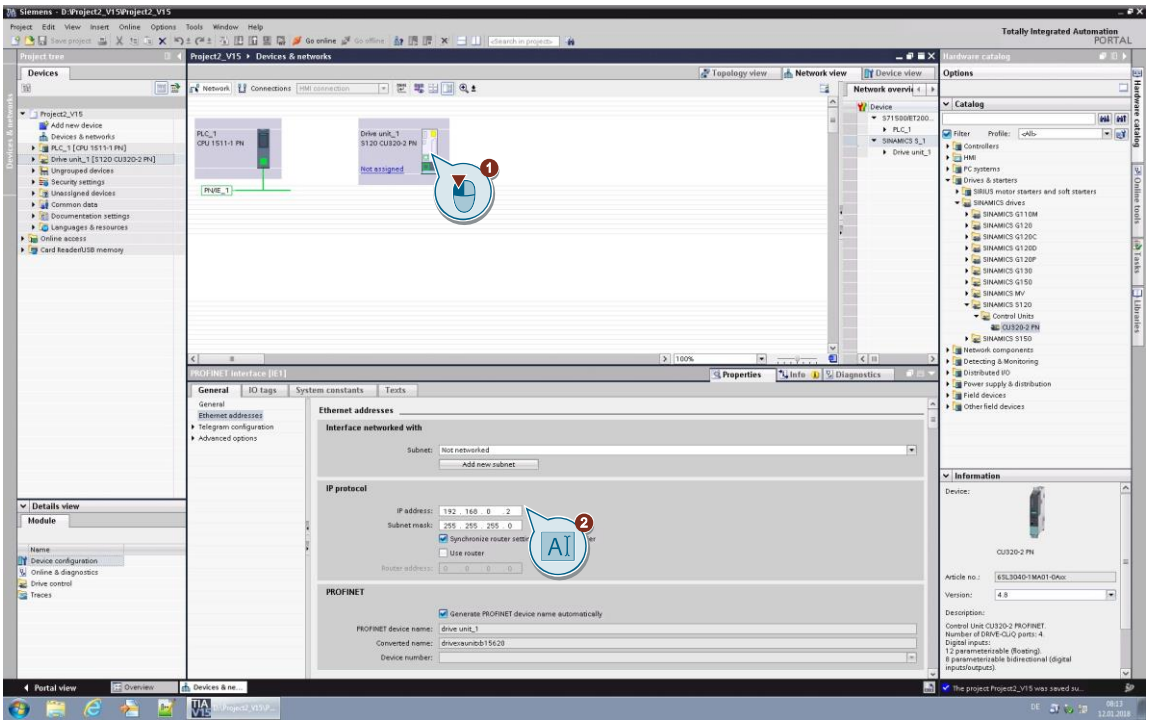
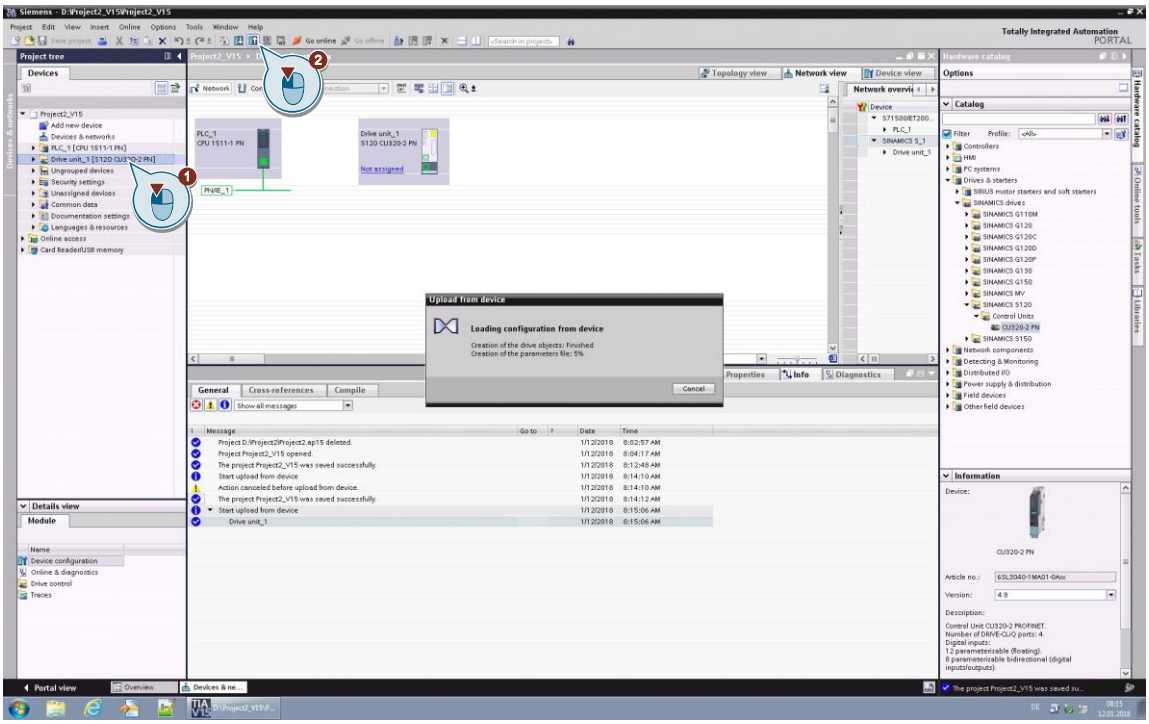
Figure 3-13



- In the next step, the configuration of the connected Control Unit is loaded in the not projected, new added drive unit. For this you have to select the drive unit in the project explorer and press the button “Upload from device”.

Figure 3-14



- The configuration is now loaded and taken over to the project.

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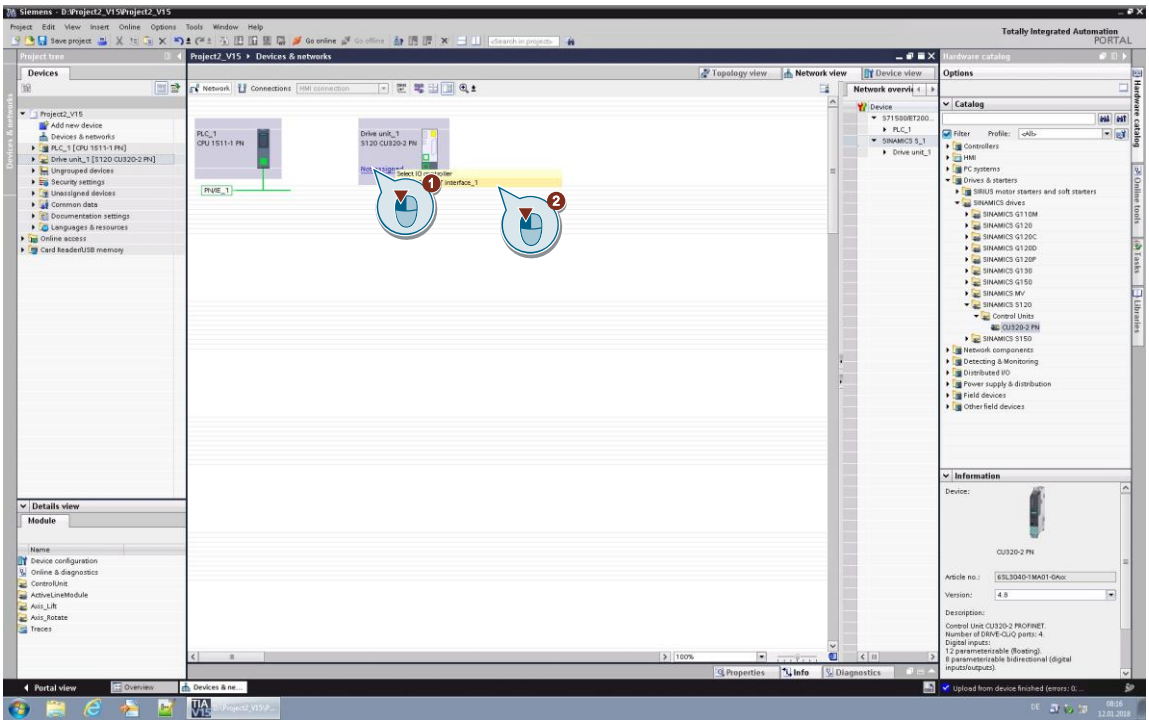
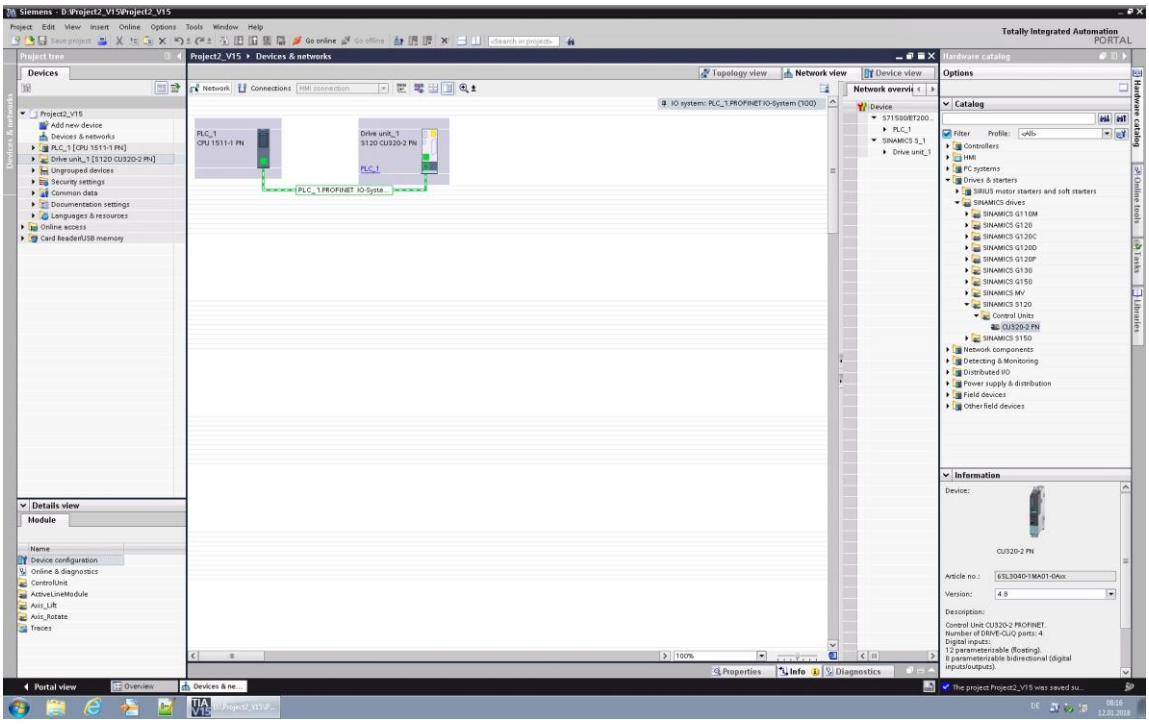
- Assign the drive unit in the network view to the PLC again. To do this, click the left mouse button on the blue "Not assigned" tag and select the appropriate interface of the PLC.

Figure 3-15



- The drive unit is now reassigned to the PLC.

Figure 3-16



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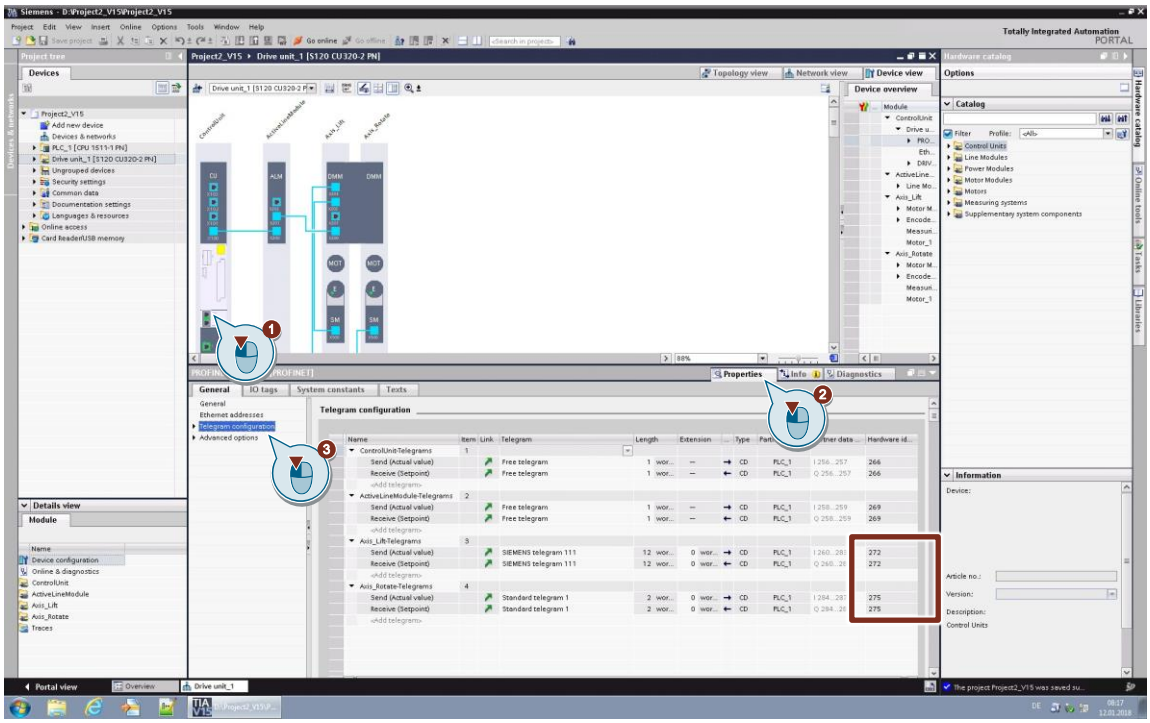
- Check the configuration in the device view of the drive unit.
- All DRIVE-CLiQ participants and their parameterization should successfully be taken over to the project.
- Check the hardware IDs of the telegrams in the properties of the PROFINET interface, in the topic Telegram configuration.

Figure 3-17



- If necessary, check and adapt the hardware IDs in your PLC program to the control blocks of the drives.

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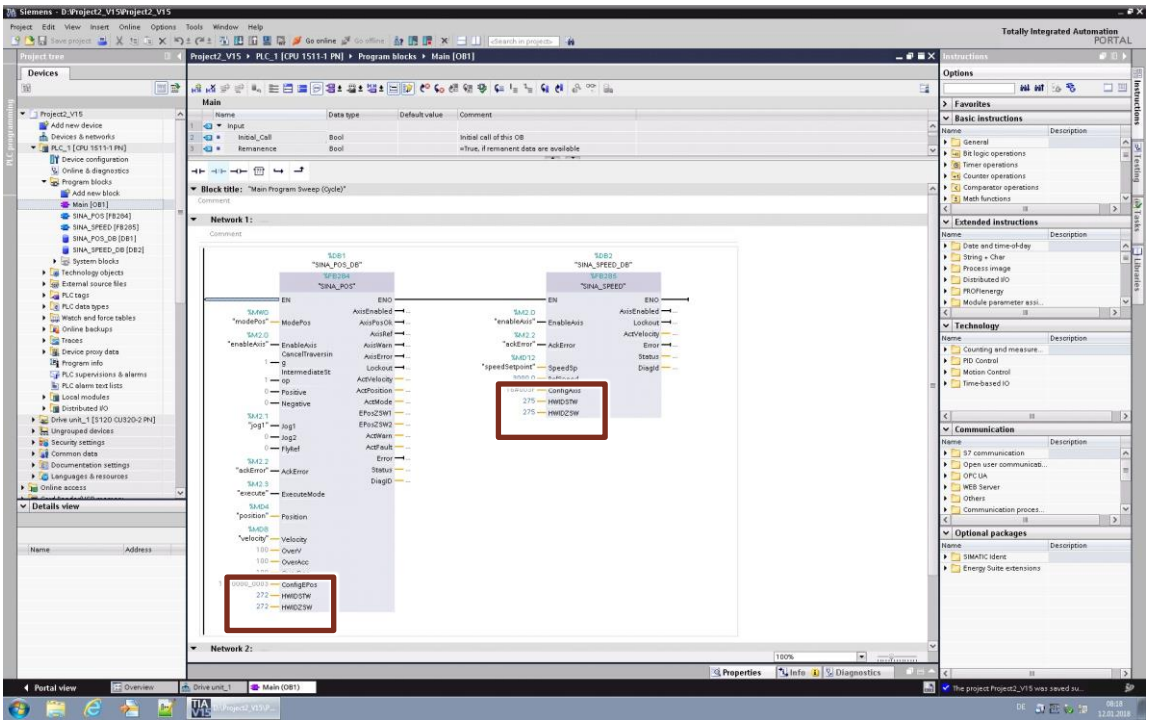
Figure 3-18



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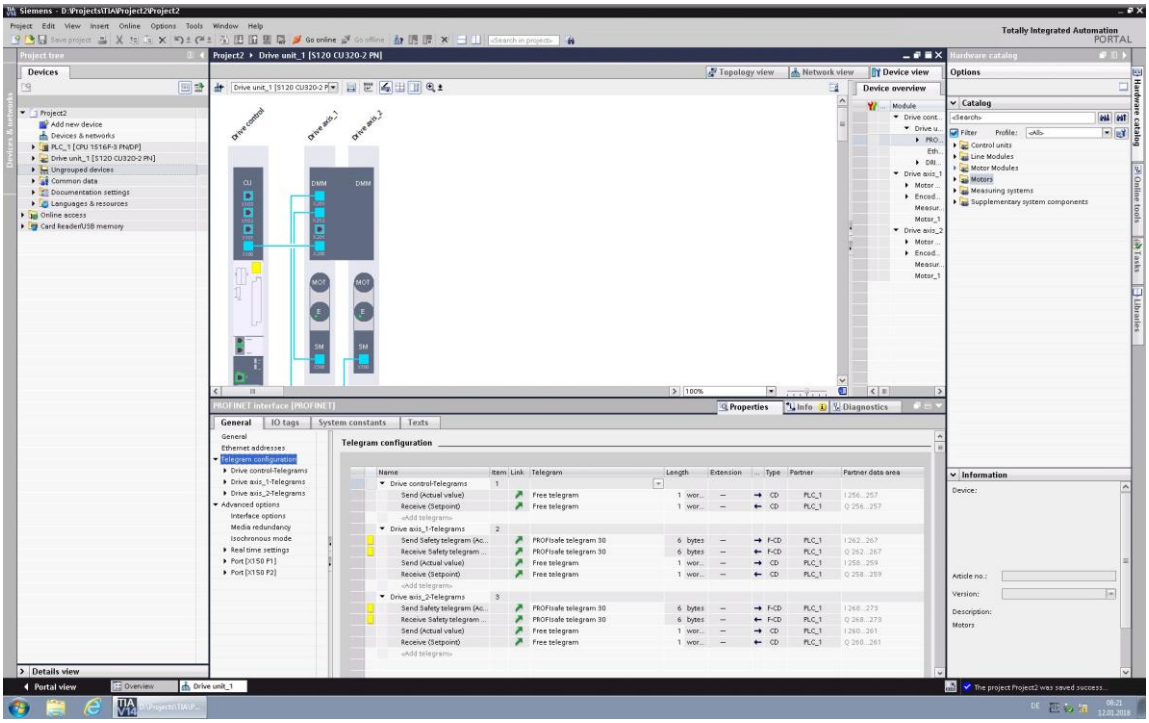
4 Use of a PROFIsafe communication

4.1 Sample Setup

- A S120 drive unit is configured, if it is attached to a SIMATIC S7-1516F-3 PN/DP.
- Two axes are configured in the drive unit

Figure 4-1



- Both axes communicate in addition to the drive telegram via PROFIsafe telegram 30 to the PLC.
- The F destination addresses are visible in the parameter view and also in the device view.

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Figure 4-2

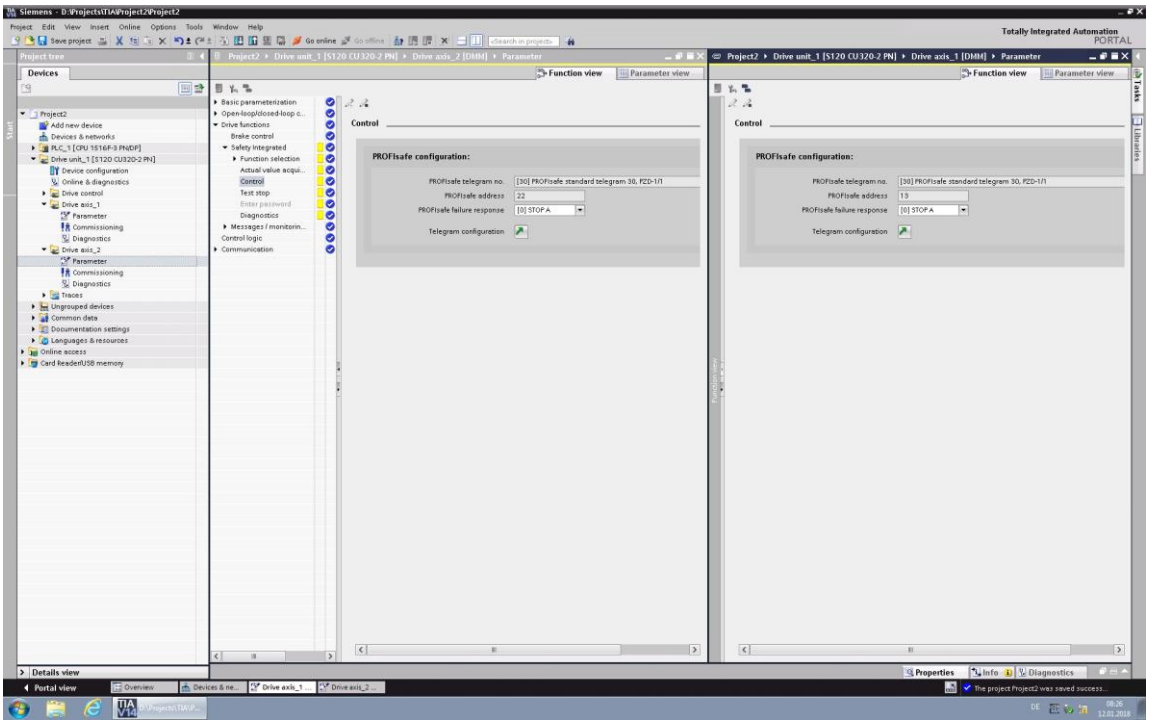
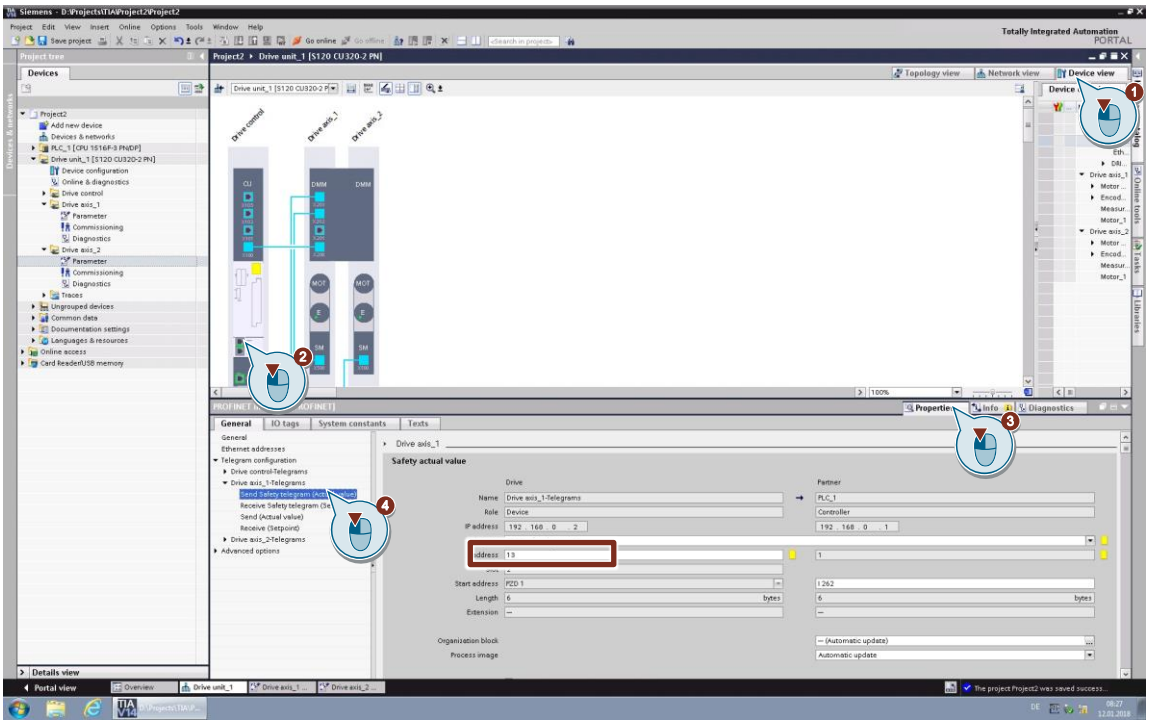


Figure 4-3



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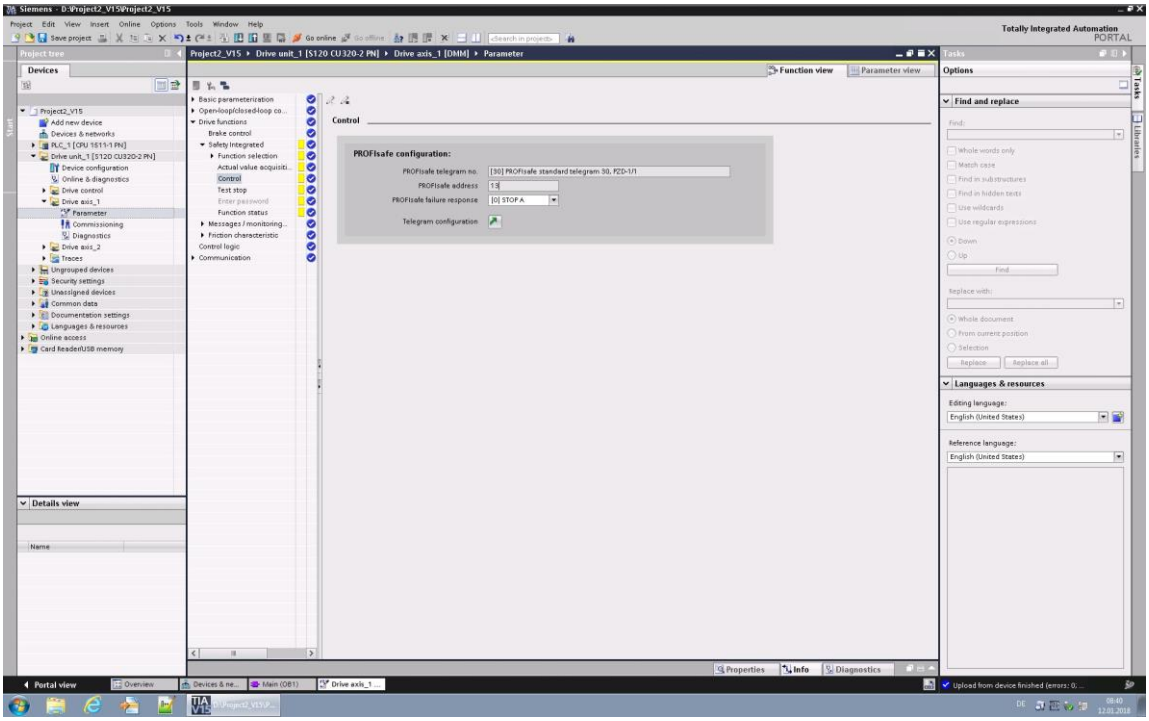
4.2 What to do?

The upgrade works as in the two scenarios described above. When uploading the drive unit to the upgraded V15, V15.1 or V16 project, the F destination addresses are also transferred. The address is automatically uploaded to the parameters of the drive and also to the hardware configuration of the drive unit. An adjustment is not necessary. Where to find the automatic settings is shown in the following description.

Where to find the F destination addresses

- Open the parameter view of the drive and find the uploaded F destination address, in the settings Parameter -> Drive functions -> Safety Integrated -> Control.

Figure 4-4



- Furthermore the F destination address is shown in the telegram settings of the drive unit.

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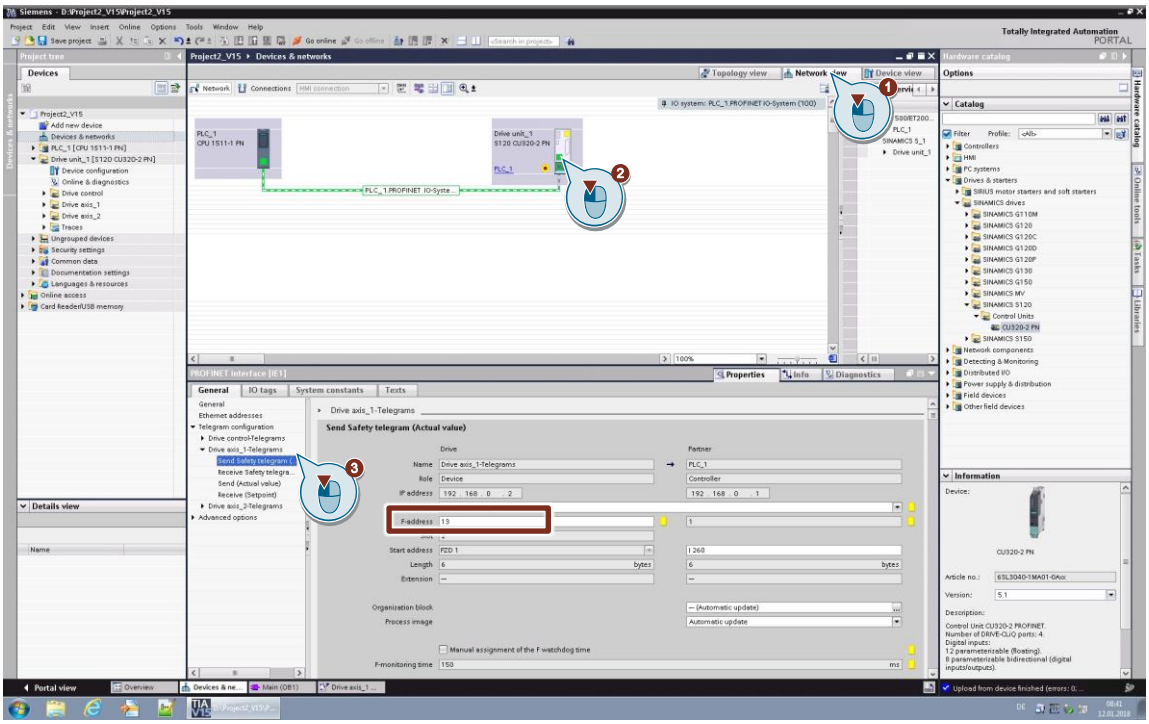
Figure 4-5



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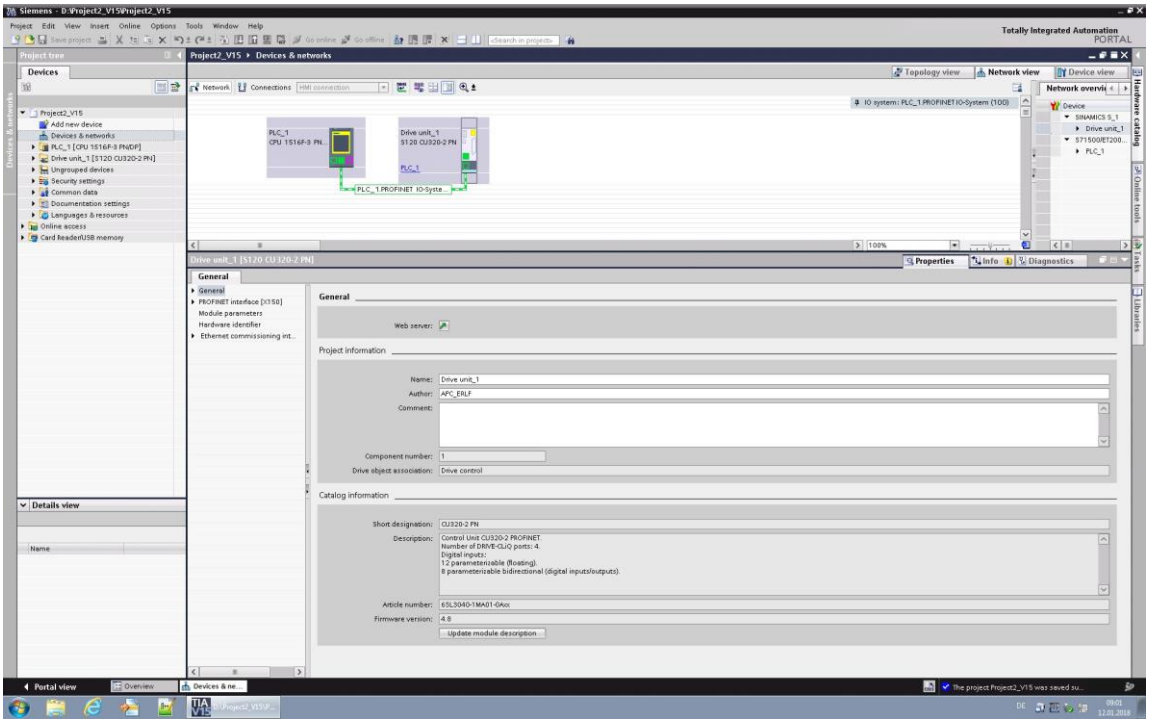
5 Upgrade of the firmware in the project

5.1 Sample Setup

- A S120 drive unit with firmware 4.8 is configured and attached to a SIMATIC S7-1516F-3 PN/DP.

Figure 5-1



- This drive unit should be upgraded in the project from firmware 4.8 to 5.1.

5.2 What to do?

The configuration of the drive unit is loaded from the project to connected drive unit. Afterwards remove the CF card from the device and connect it via a card reader with the computer. The USER and OEM folders of the card are temporary stored and the new software is copied to the CF card. After copying the stored folders back to the CF card the configuration of the device is loaded to a new inserted device in the TIA project.

5.3 Detailed description of the implementation

Preparation

Connect a Control Unit CU320-2PN with firmware 4.8 (in factory setting) to the power supply. The CU should not be attached to any other DRIVE-CLiQ participant such as Terminal Board 30, Line Module and Motor Module etcetera.

Establish a connection between your computer and the X150 port of your CU via an Ethernet connection.

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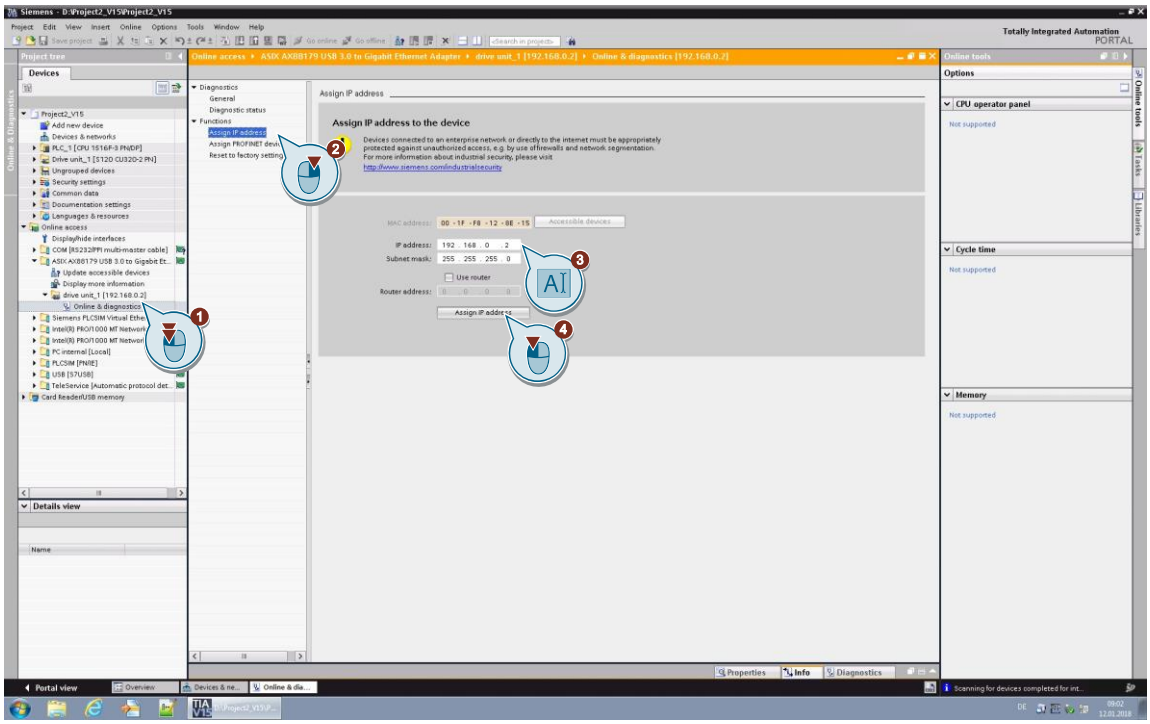
Necessary steps in the project

- Search for the connected Control Unit in TIA Portal under Online access.
- Open the Online & diagnostics wizard and assign the same IP address to the CU like the projected device that should be upgraded.

Figure 5-2



- Download the configuration of the device to the connected Control Unit.
- Save the parameterization retentively to the device's ROM after the download. For that, you should set this option in the download mask.

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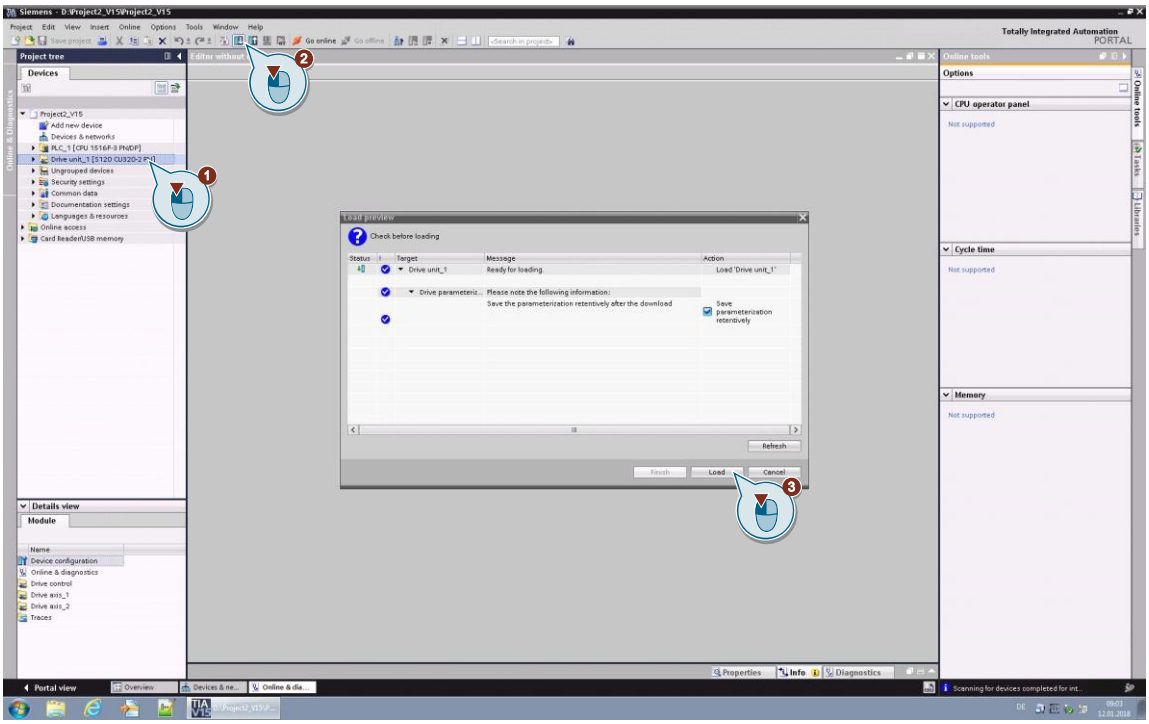
Figure 5-3



- Switch off the Control Unit by disconnecting the 24V supply.
- Pull the CF card out of the device's slot and insert the card into your PC (e.g. by using a card reader).
- Open the content of the CF card and copy the USER and OEM folder to a temporary location on your PC.
- Please do not forget to copy the KEYS folder as well in case there is one available on the CF card! This folder contains the license keys which are assigned to this CF card.

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Figure 5-4

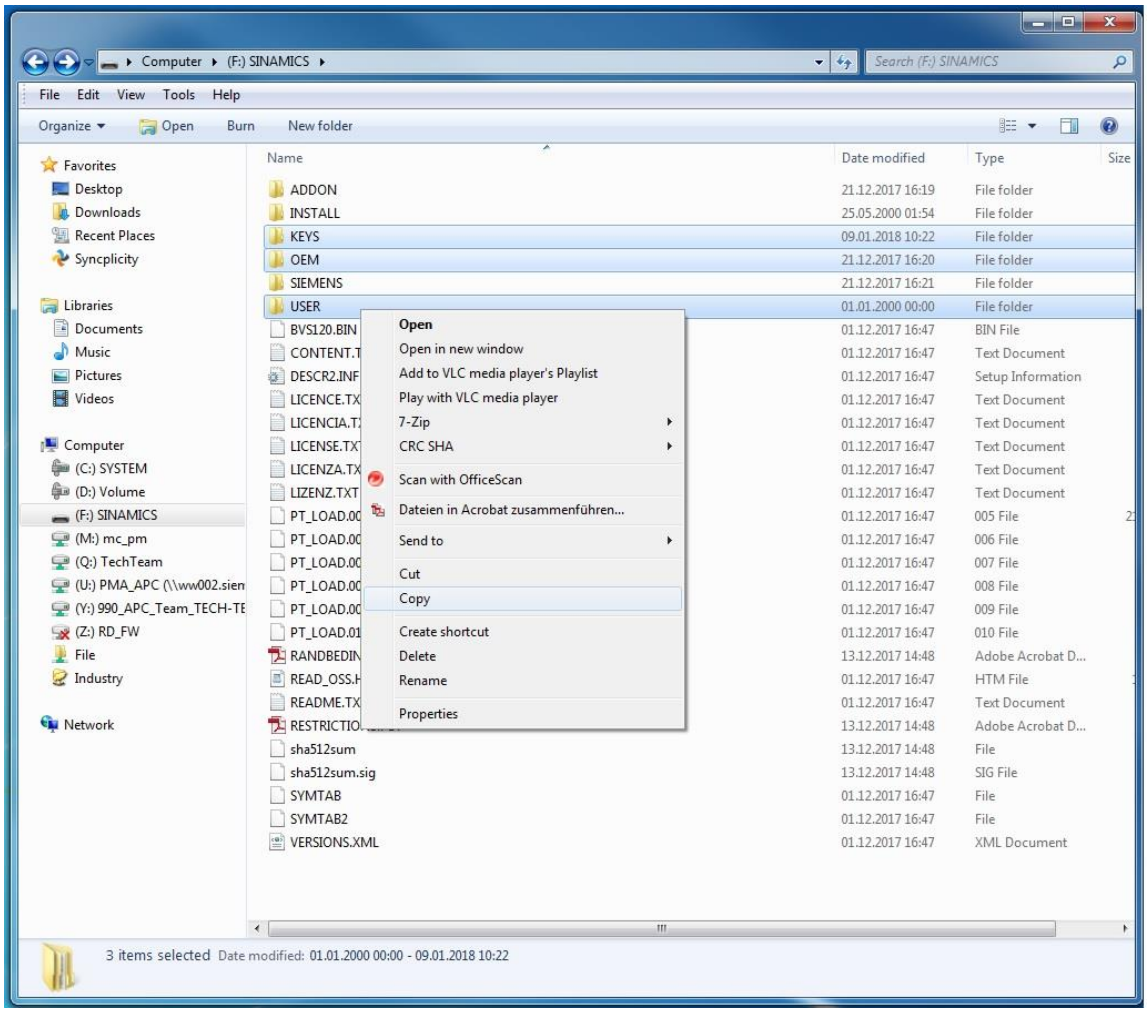

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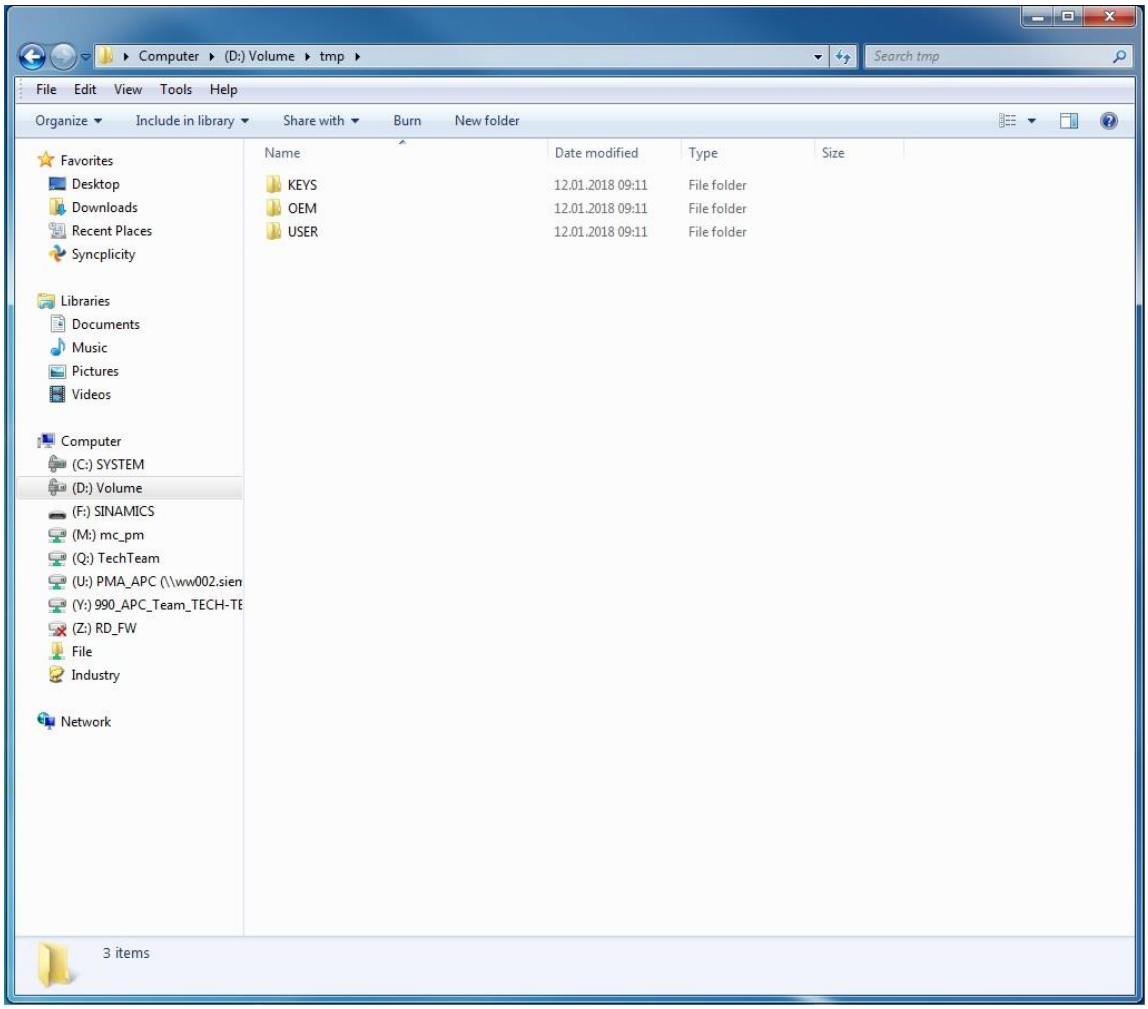
Figure 5-5



- Delete the whole content of the CF card.

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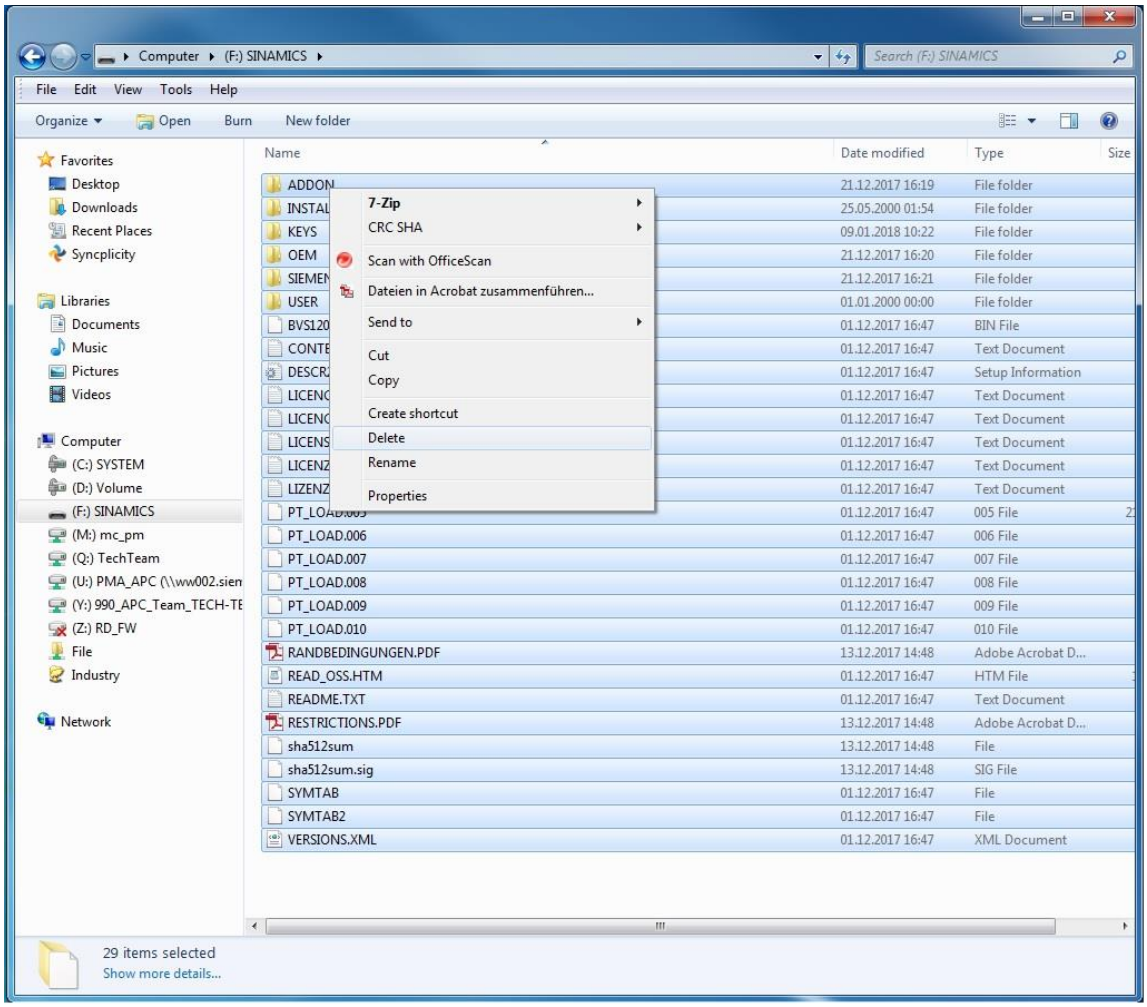
Figure 5-6



- Copy the files of the new firmware 5.1 to the CF card (firmware files can be downloaded on the Siemens Industry Online Support webpages).
- Copy the temporary stored folders USER, OEM and if available KEYS back to the CF card.
- Integrate and replace all folders and files.
- After the copying is finished pull the CF card out of your PC and put it back to the Control Units card slot. Power on the Control Unit again.
- In the TIA Portal project delete the device with the old configuration.

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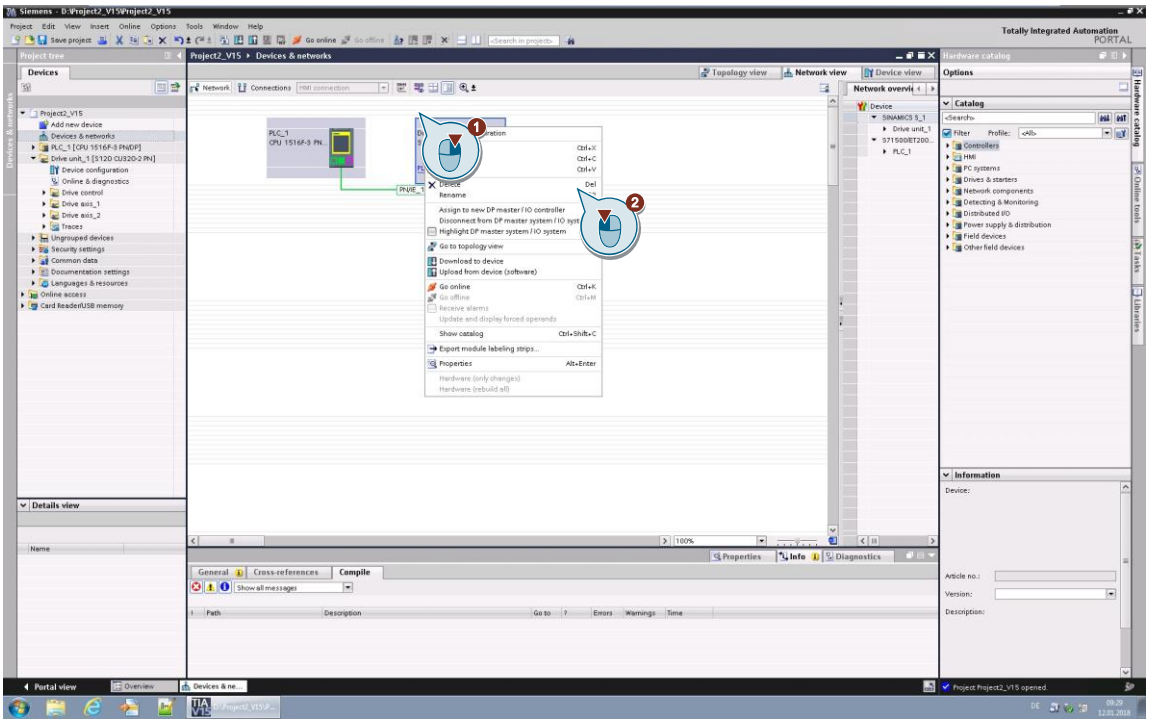
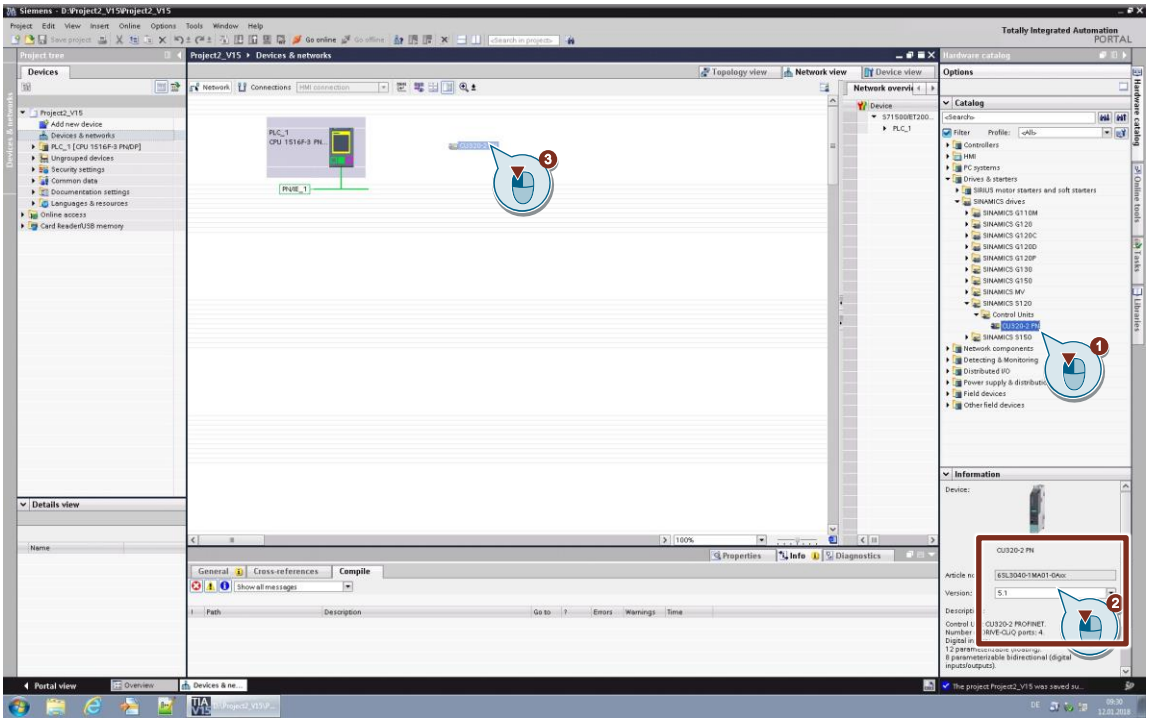
Figure 5-7



- Add a new drive unit with firmware version 5.1 to the Network view.

Figure 5-8



- Adjust the IP address of the new device to ensure being able to get online with the connected Control Unit.

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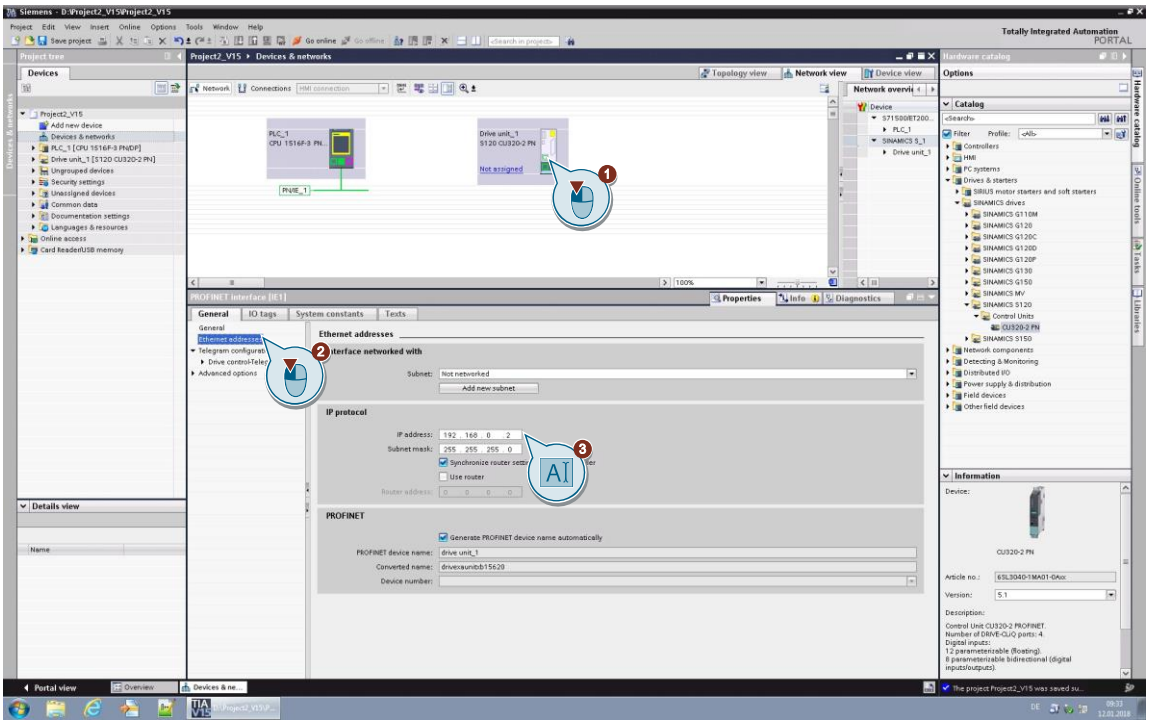
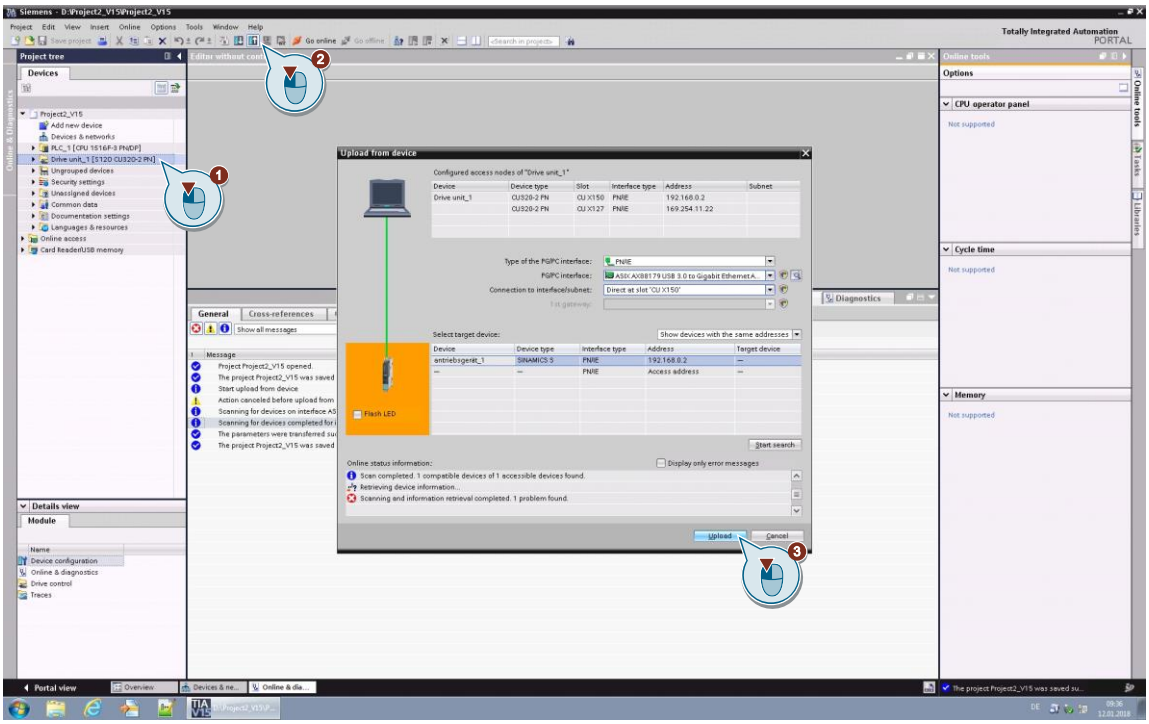
Figure 5-9



- Upload the configuration from the connected Control Unit to the new added device in the project. For that select the device and click on "Upload from device".

Figure 5-10



- Reassign the drive unit to the PLC.

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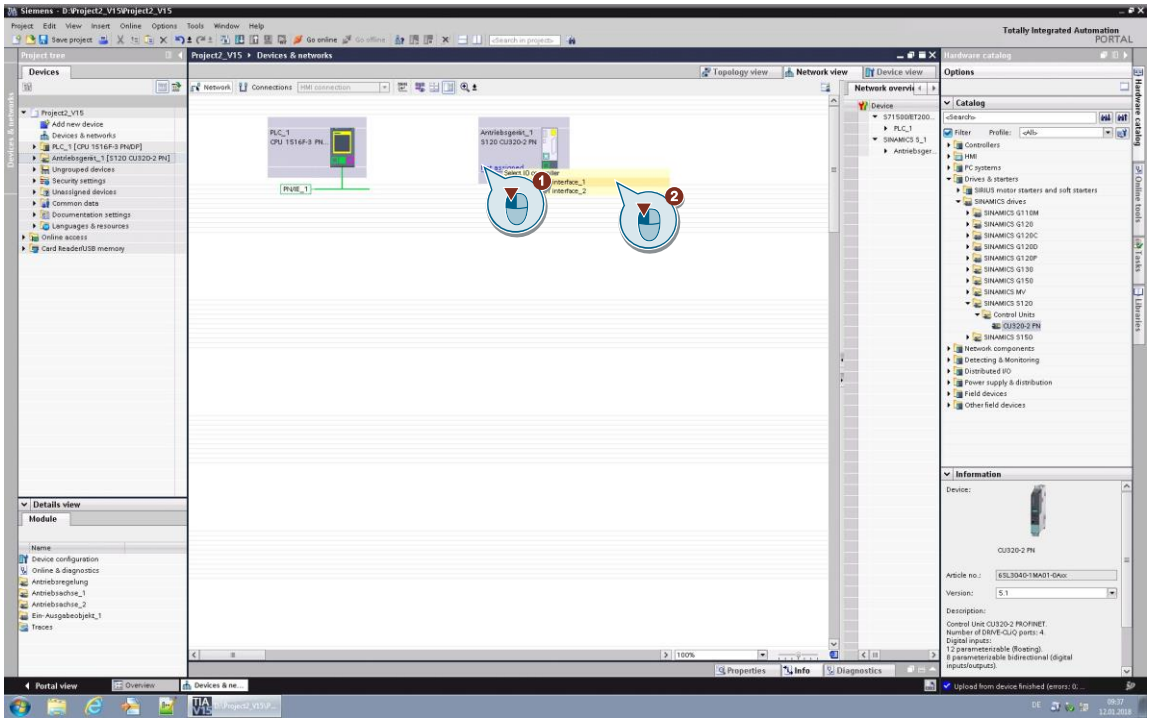
Figure 5-11



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