Digitization with TIA Portal: Exchange of planning data from TIA Selection Tool via EPLAN Electric P8 in TIA Portal

TIA Portal V15.1, TIA Selection Tool, EPLAN Electric P8 V2.8

https://support.industry.siemens.com/cs/ww/en/view/109748224

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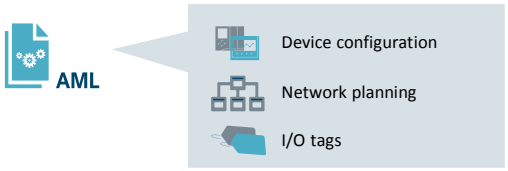
1 Introduction

1.1 Overview

The project planning data (device configuration, network configuration, PLC variables) of machines and systems are required by various tools. The open standard "Automation Markup Language" (AutomationML) has been developed so that project planning does not have to be recreated in each individual tool. AutomationML is an XML-based data format (AML file) for storing and exchanging project planning data.

Figure 1-1: Configuration data in AML file



1.2 Principle of operation

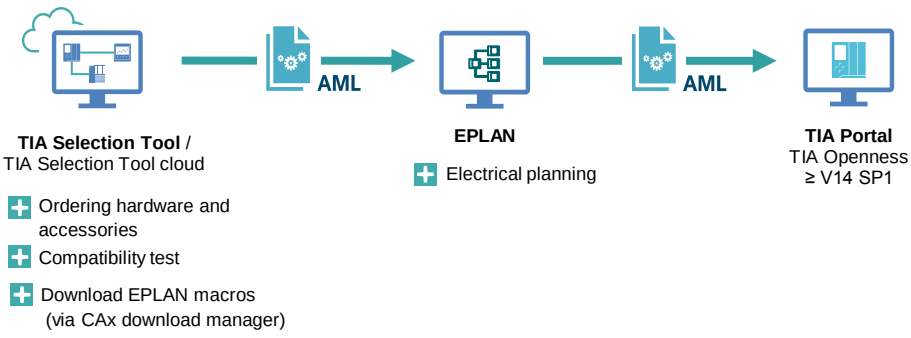
To create an order list for the required components, the automation hardware is configured with the TIA Selection Tool (TST). TST enables direct ordering at the Siemens Industry Mall. TST can also be used to request the product data (EPLAN macros, dimensional drawings, 3D models, manuals, certificates, ...) of the Siemens articles used via the CAx Download Manager.

The configuration data generated in TST is exported to an AML file and imported into EPLAN Electric P8. The circuit diagrams are created in EPLAN Electric P8 using the imported data. For imported articles that are not available in the article management of EPLAN Electric P8, the EPLAN macros must be imported from the CAx Download Manager or macros from other manufacturers.

Once the circuit diagrams have been created, the data from EPLAN Electric P8 is exported to an AML file and imported into TIA Portal. The device configuration, the network configuration and the topology are adopted.

The following figure shows the workflow described in this application example.

Figure 1-2: TST → EPLAN → TIA Portal ≥ V14 SP1



1.3 Components used

The following hardware and software components were used to create this application example:

Table 1-1

Components	Quantity	Article number	Note
SIMATIC STEP 7 Professional V15.1	1	6ES7822-1..05-..	Download or DVD
TIA Portal Openness V15.1	1	-	Component of TIA Portal
SIMATIC STEP 7 Safety V15.1	1	6ES7833-1F.15-0Y..	
SINAMICS Startdrive Advanced V15.1	1	6SL3072-4FA02-0X..	Oder SINAMICS Startdrive Basic V15.1
TIA Selection Tool V 2019.5.0.5716 or TIA Selection Tool cloud	1	-	Download http://www.siemens.com/tst http://www.siemens.com/tstcloud
EPLAN Electric P8 V2.8	1	-	https://www.eplan.de/en/start/
MS SQL Server 2014 Express	1	-	https://www.microsoft.com/ Product is used as part database for EPLAN Electric P8. Alternative: MS Access

This application example consists of the following components:

Table 1-2

Components	File name
TIA Selection Tool and EPLAN sample project with AML files	109748224_TST_to_EPLAN_to_TIA_Portal_PROJ_v20.zip
Documentation	109748224_TST_to_EPLAN_to_TIA_Portal_PROJ_v20_en.pdf

2 Engineering

2.1 From TST to EPLAN Electric P8

2.1.1 Restrictions

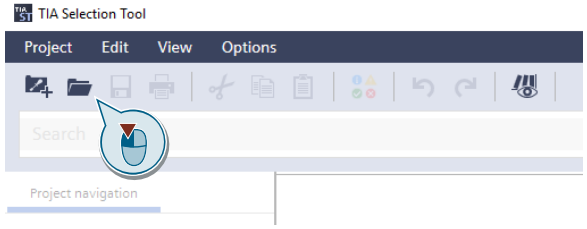
Note Note that drives, HMI devices and devices configured in TST with GSD or GSDML are not exported to the AML file.

2.1.2 Export TST project for EPLAN

In this application example, the TIA Selection Tool is used as a desktop version (offline version). To export the TST sample project for EPLAN, proceed as follows:

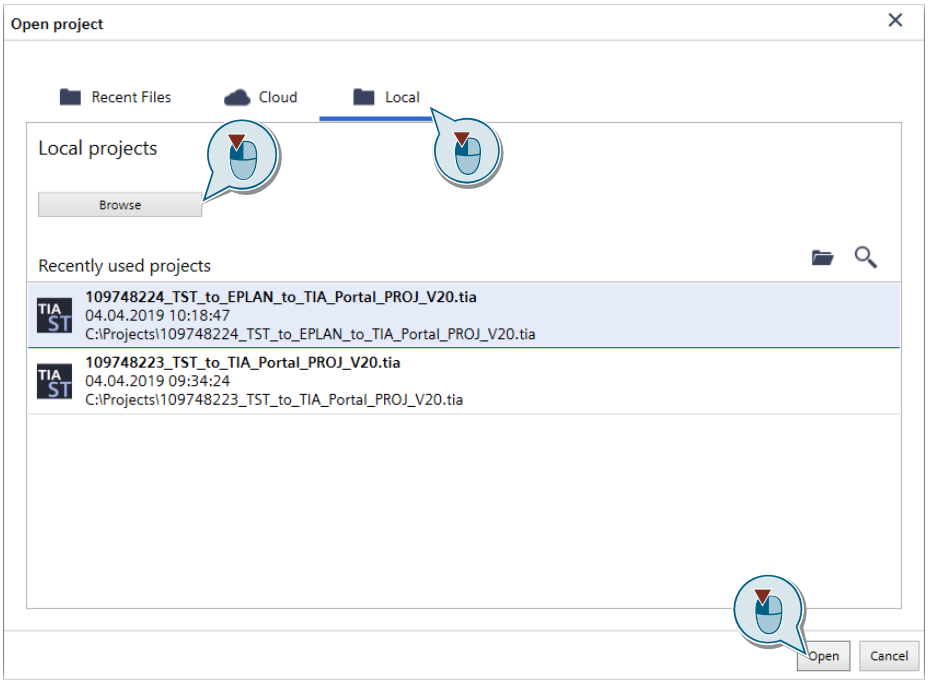
1. Open the TIA Selection Tool.
2. Switch to the project view.
3. Click on the "Open project" button.

Figure 2-1: Open TST



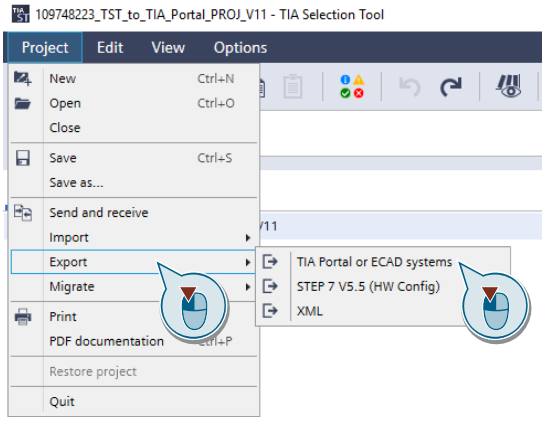
4. Click Local, then Browse, and navigate to the sample TST project. Confirm the dialog with "Open".

Figure 2-2: Select TST project



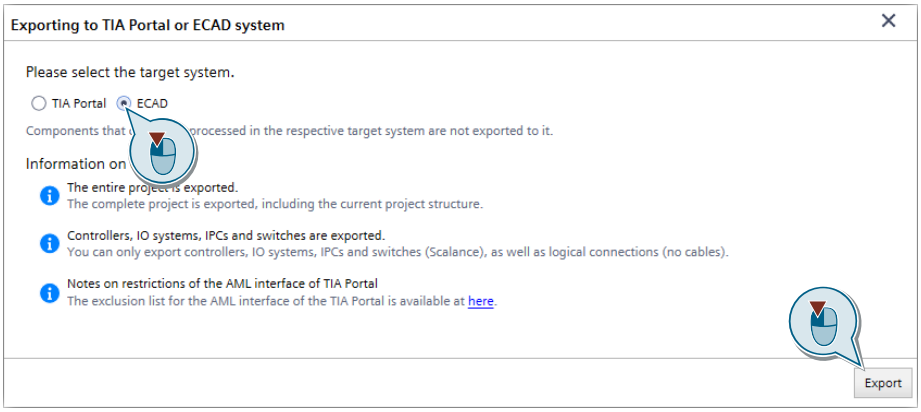
5. From the menu bar, click Export > TIA Portal or ECAD Systems.

Figure 2-3: Export



6. Select "ECAD" in the dialog and click on the "Export" button.

Figure 2-4: Select ECAD



7. Specify a storage path and the file name.

2.1.3 Download EPLAN macros with TST and CAx Download Manager

EPLAN Electric P8 uses an article database to manage all article data and the associated EPLAN macros.

Before you integrate the AML file exported from TST into EPLAN Electric P8, all EPLAN macros of the configured devices must be available in the EPLAN Electric P8 parts database.

You can use TST to request the download of the EPLAN macros for the configured Siemens devices. The download is carried out using the CAx Download Manager in Online Support.

https://support.industry.siemens.com/My/ww/en/CAxOnline

Notes

If the TST project contains assembled modules that are ordered via a common MLFB (bundles), e.g. ET 200SP (6ES7155-6AA01-0BN0), you must manually download the EPLAN macros of the individual articles. The CAx export currently only exports the article numbers of the bundle. The following individual articles are required for further processing of the example project in EPLAN.

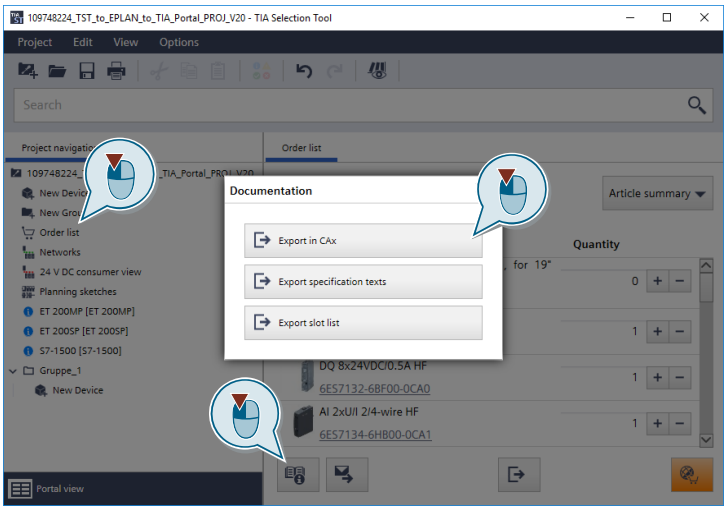
- Interface module (6ES7155-6AU01-0BN0)
- Server module (6ES7193-6PA00-0AA0)
- Bus adapter BA 2xRJ45 (6ES7193-6AR00-0AA0)

Under the following link you will find the Siemens image database. Here you can also download product photos, product symbols and CAx data:
https://www.automation.siemens.com/bilddb

To request the EPLAN macros from TST and download them using the CAx Download Manager, proceed as follows:

1. Open the "Order list" in the project navigation.
2. Click on the "Documentation" button and then on "Export to CAx".

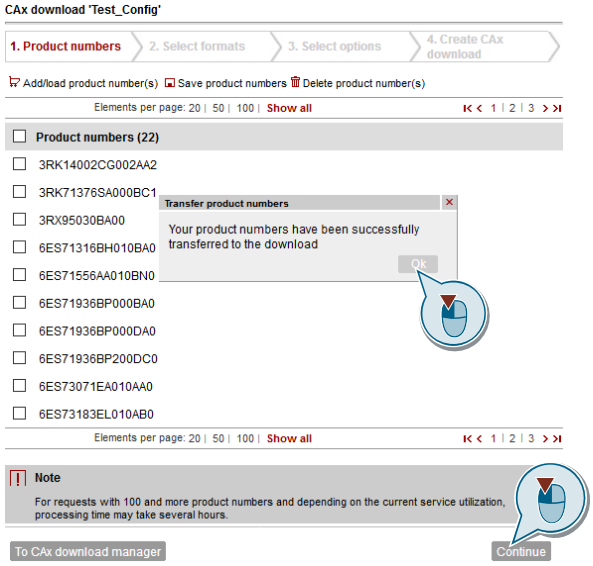
   Figure 2-5: CAx Export



3. Your browser will open. Log in to the CAx Download Manager or register as a new user.

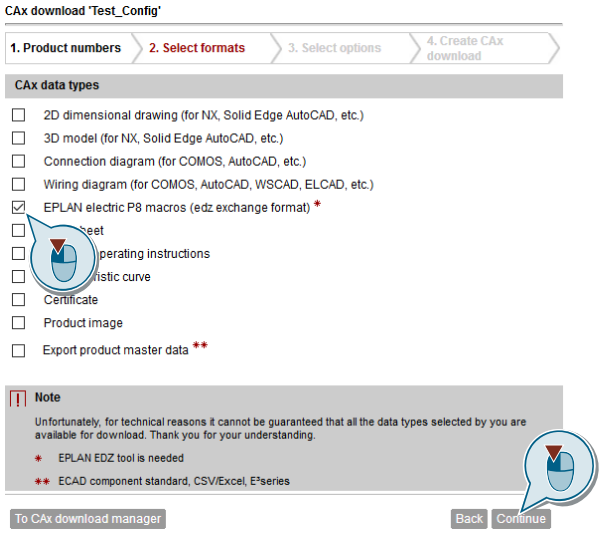
4. The CAx Download Manager shows you the transferred devices. If necessary, add additional article numbers and confirm the dialog with "Ok. Click "Next" ("Continue").

Figure 2-6: CAx Download Manager Transferred article numbers



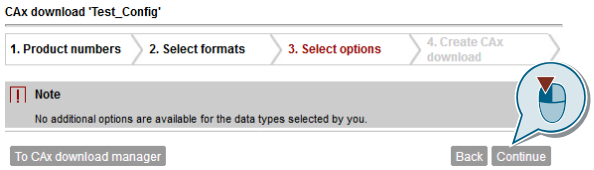
5. Select "EPLAN Electric P8 Macros" ("EPLAN Electric P8 macros") and click "Next" ("Continue").

Figure 2-7 CAx Download Manager Selection CAx Data type EPLAN macro



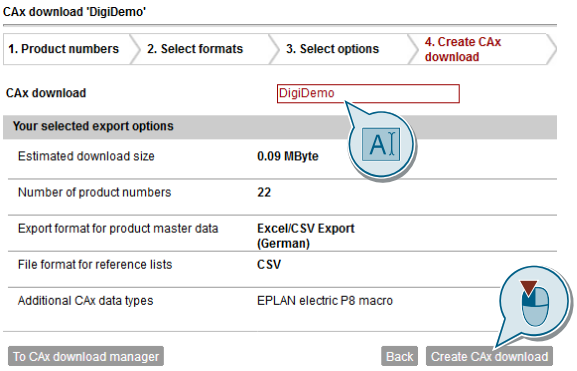
6. Confirm the dialog with "Continue".

Figure 2-8: CAx Download Manager



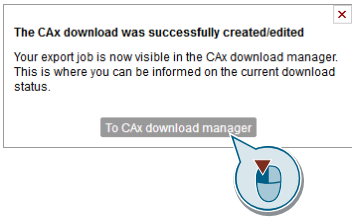
7. Specify a name for the download and click the Create CAx download button.

Figure 2-9: CAx Download Manager Creating a CAx Download



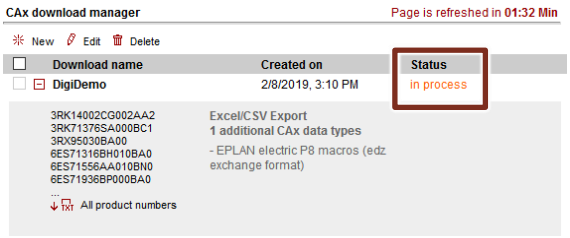
8. The final dialog informs you that the CAx download has been created successfully. Click "Go to CAx download manager" ("To CAx download manager").

Figure 2-10: CAx Download Manager Completing the CAx Download Request



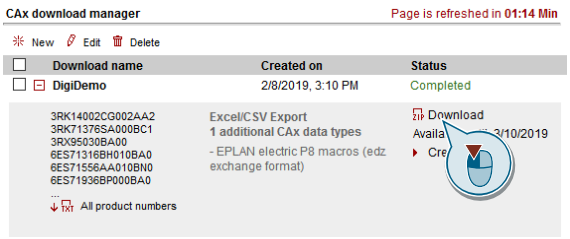
9. The current status is displayed in the CAx Download Manager. It may take a few minutes until the data is ready for download.

Figure 2-11: CAx Download Manager Processing Status of the CAx Download



10. When the download is ready, click on "Download".

Figure 2-12: CAx Download Manager Download EPLAN macros



11. Select a storage path and save the zip file. Unzip the .zip file.
12. The EPLAN macros can now be imported into EPLAN Electric P8.

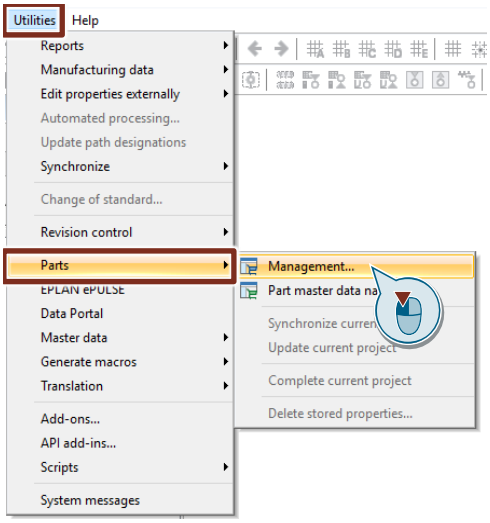
Note EPLAN macros for articles from other manufacturers must be obtained from the manufacturer.

2.1.4 Import theEPLAN Macros in EPLAN Electric P8

To import the downloaded EPLAN macros into the EPLAN Electric P8 parts database, proceed as follows:

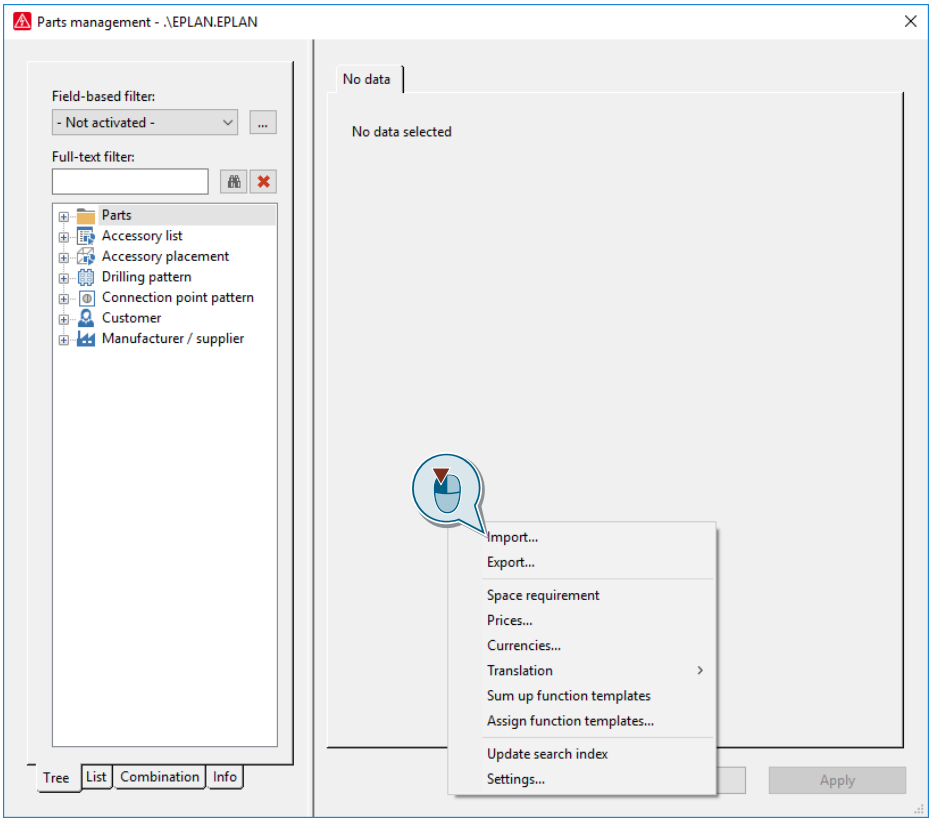
1. Open EPLAN Electric P8.
2. Click on "Utilities > Articles > Administration..." in the menu bar. ("Utilities > Parts > Management...").

Figure 2-13: Open article management



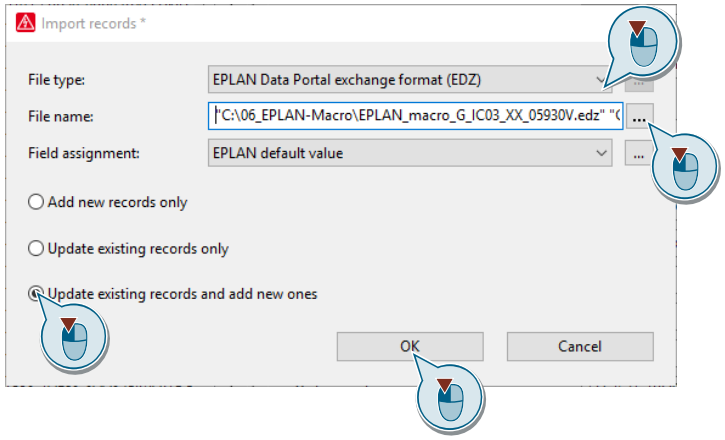
3. Click on "Tools > Import...". ("Extras > Import...").

Figure 2-14: Starting the CAx Import



4. Set the following in the dialog:
   - "Enter "EPLAN Data Portal - exchange format (EDZ)" ("EPLAN Data Portal exchange format (EDZ)") for "File type".
   - Under "File name", navigate to the macros to be imported with the file extension "edz".
   - Select Update existing records and add new ones.
   - Confirm the dialog with "OK".

Figure 2-15: Select EDZ file



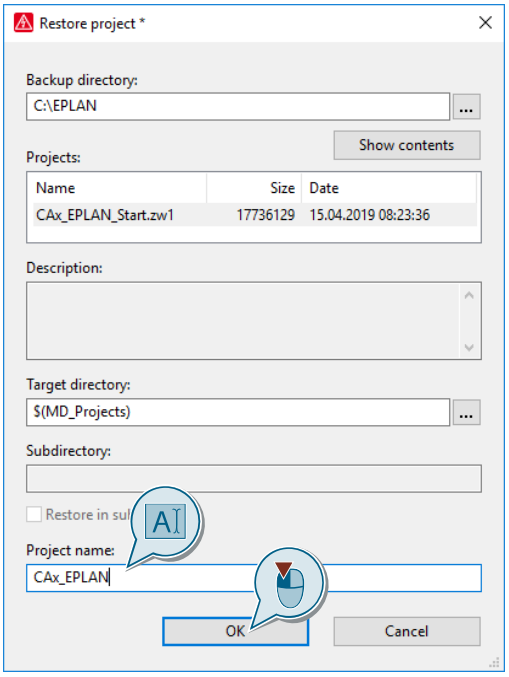
5. Close the following dialog with "Close".

2.1.5 Import AML file into EPLAN project

To import an AML file from TST into EPLAN, proceed as follows:

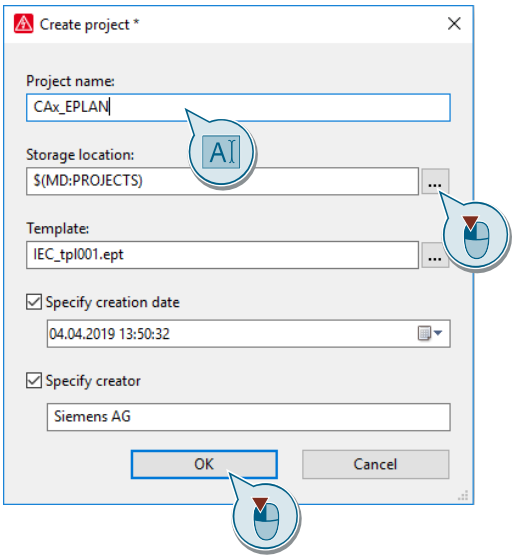
1. Open EPLAN Electric P8.
2. Open the supplied EPLAN project "CAx_EPLAN_Start" by restoring it.
   The EPLAN project "CAx_EPLAN_Start" already contains a drive.

Figure 2-16: Restore EPLAN project



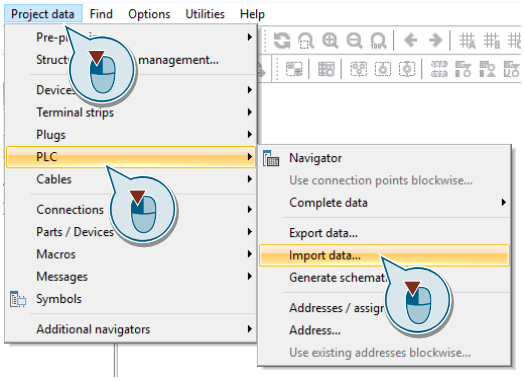
Optional: Create a new project and accept the default setting with "OK".

Figure 2-17: Creating an EPLAN project



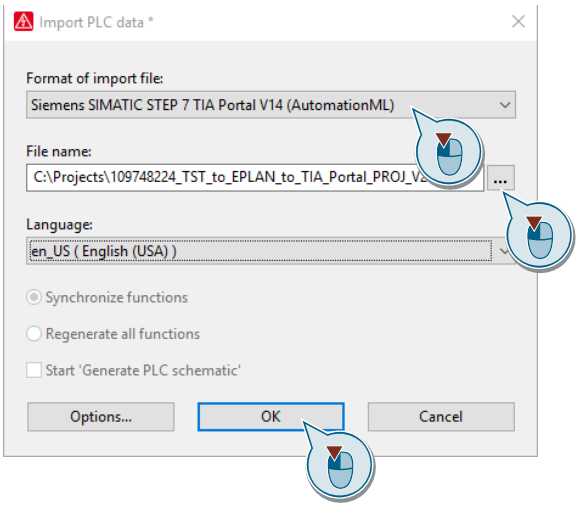
3. Click on "Project data > PLC > Import data..." in the menu bar. ("Project data > PLC > Import data...").

Figure 2-18: Start importing AML



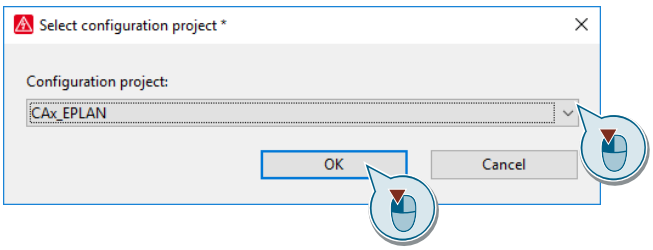
4. Set the following in the dialog:
   - Select "Siemens SIMATIC STEP 7 TIA-Portal V14 (AutomationML)" under "Format of input file".
   - Under "File name", navigate to the AML file exported by TST.
   - Click on "OK".

Figure 2-19: Import AML



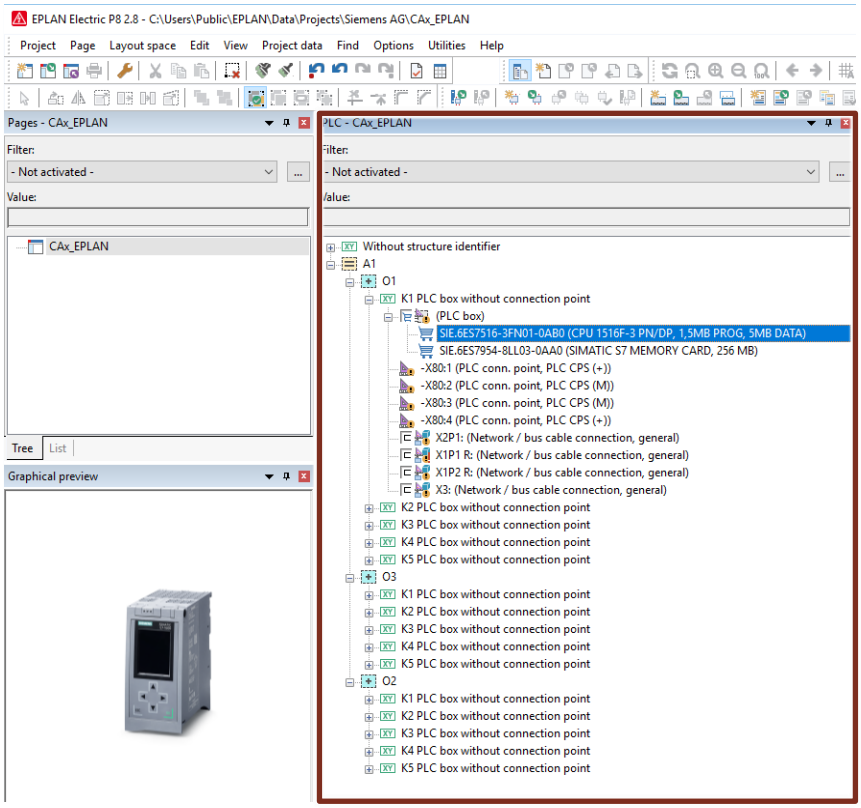
5. Select the Configuration project and click on "OK".

Figure 2-20: Configuration project



6. Open the PLC Navigator under "Product data > PLC > Navigator" ("Product data > PLC > Navigator"). Here you will find all imported devices from the AML file.

Figure 2-21 EPLAN SPS-Navigator



7. The import is complete and you can continue with the creation of the schematics.

2.1.6 Configuring ET 200SP with bus adapter from TST to EPLAN

Note Information on how to configure an ET 200SP with bus adapter from TST into EPLAN can be found in the FAQ "How do I work with Siemens EPLAN macros ET 200SP?

https://support.industry.siemens.com/cs/ww/en/view/109766667

2.2 From EPLAN Electric P8 to TIA PORTAL

2.2.1 Restrictions

In principle, only products that are located in the HW catalog of the TIA Portal are supported for import into the TIA Portal.

Note Further restrictions for importing devices into TIA Portal can be found in the system manual "SIMATIC Openness: Automate project creation" in chapter "Export/Import > Import/Export Hardware Data > Export CAx Data".

https://support.industry.siemens.com/cs/ww/en/view/109477163/108835689227

2.2.2 Data exported to AML file

Project data, such as logical network configuration, topological network configuration and PLC variables of the inputs/outputs for the TIA portal, must be correctly configured in the EPLAN project to be exported.

Note General information on features in EPLAN macros for AML data exchange can be found in the FAQ "Which EPLAN data is required for AML data exchange?

https://support.industry.siemens.com/cs/ww/en/view/109766653

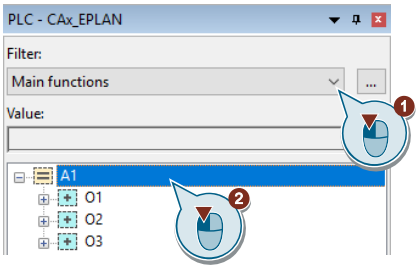
2.2.3 Addressing of inputs and outputs

In EPLAN Electric P8 you can assign addresses to the input and output modules used.

Follow the steps below:

1. Open the "PLC Navigator" and select the "Main function" filter.
2. Select the top level if you want to address all assemblies.
   If you only want to address a part or an individual assembly, select only the corresponding area or assembly.

   Figure 2-22: EPLAN SPS-Navigator



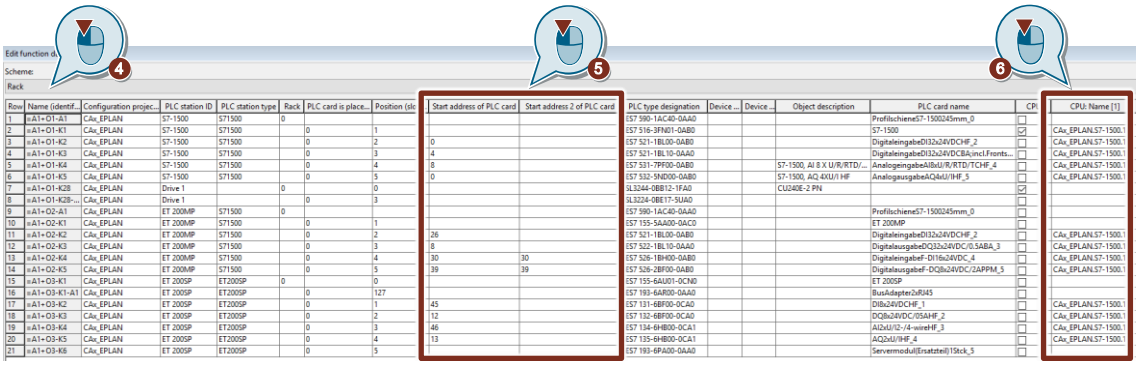
3. Open the Tabular processing with the key combination "Ctrl+Q".
   Alternative: Right-click on the highlighted area and select "Edit in table" from the context menu.

4. Select the schema "Assembly" ("Rack") in the tabular processing.
5. Enter the start addresses of the modules in the column "Start address of PLC card" or in the column "Start address 2 of PLC card".

   Note the following:

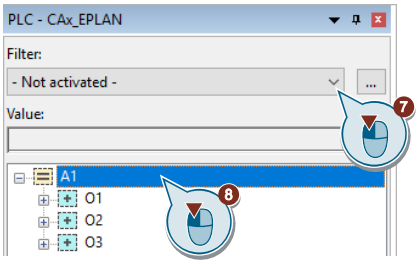
   - Refer to the manuals of the respective modules for the size of the required input/output area.
   - For pure input/output modules, enter the start address in the "Start address of PLC card" column.
   - For mixed input/output modules, enter the start address for inputs in the column "Start address of PLC card" and the start address for outputs in the column "Start address 2 of PLC card".
   - Safety input/output modules each have an input and an output range. For safety modules, enter the start address for input/output modules in the "Start address of PLC card" column. Enter the same start address in the column "Start address 2 of PLC card".
   - Address overlaps in automatic addressing are either marked red in the result preview or the next free address is used instead of the specified start address.
   - Address overlaps are also detected when importing the AML file into the TIA Portal and displayed as an error or warning in the Inspector window.
6. In the column "CPU: Name[1]" enter the name of the PLC to which the module is to be assigned.

Figure 2-23: Tabular processing



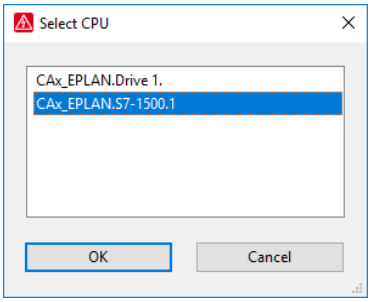
7. In the "PLC Navigator" ("PLC Navigator") select the filter "- Not activated -". ("- Not activated -").
8. Select the top level again.

Figure 2-24: EPLAN SPS-Navigator



9. Start the addressing with "Project data > PLC > Address...". ("Project data > PLC > Address...").
10. Select the corresponding PLC.

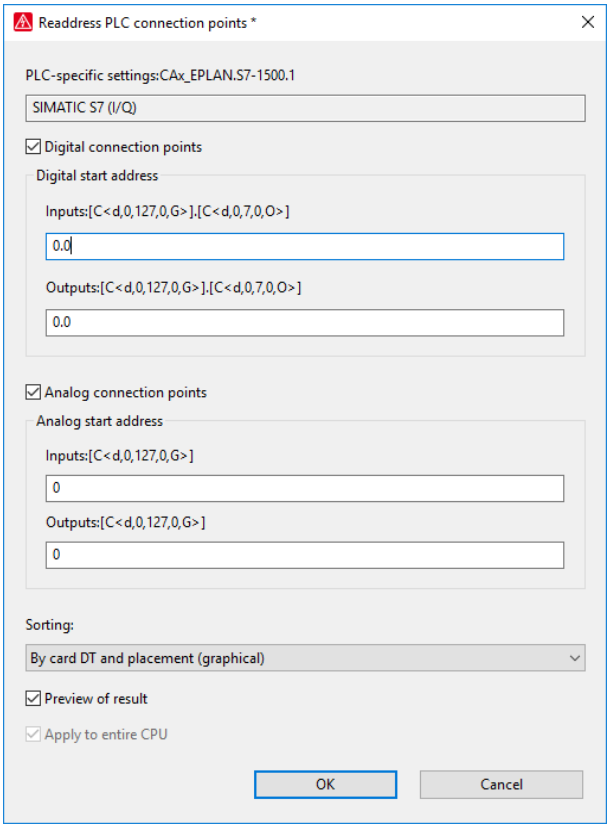
Figure 2-25: PLC Selection



11. In the following dialog select whether you want to address digital and analog modules and confirm your entry with "OK".

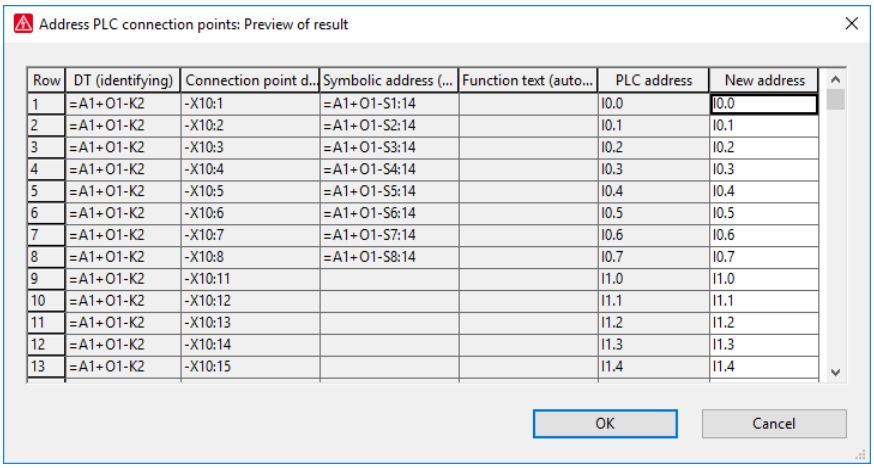
    Start addresses do not have to be entered, since they have already been assigned in tabular processing.

Figure 2-26: Re-address PLC connections



12. Check the addressing in the result preview and, if necessary, confirm the result with "OK".

Figure 2-27: Address PLC connections: Result preview



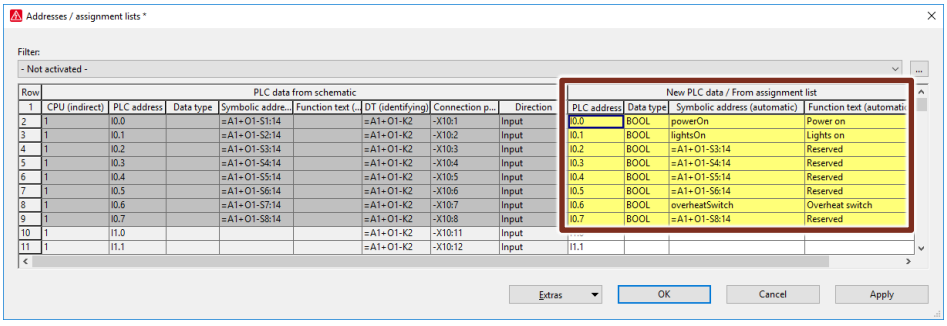
2.2.4 Symbolic addressing of inputs and outputs

In EPLAN Electric P8 you can assign symbolic addresses to the PLC addresses.

Follow the steps below:

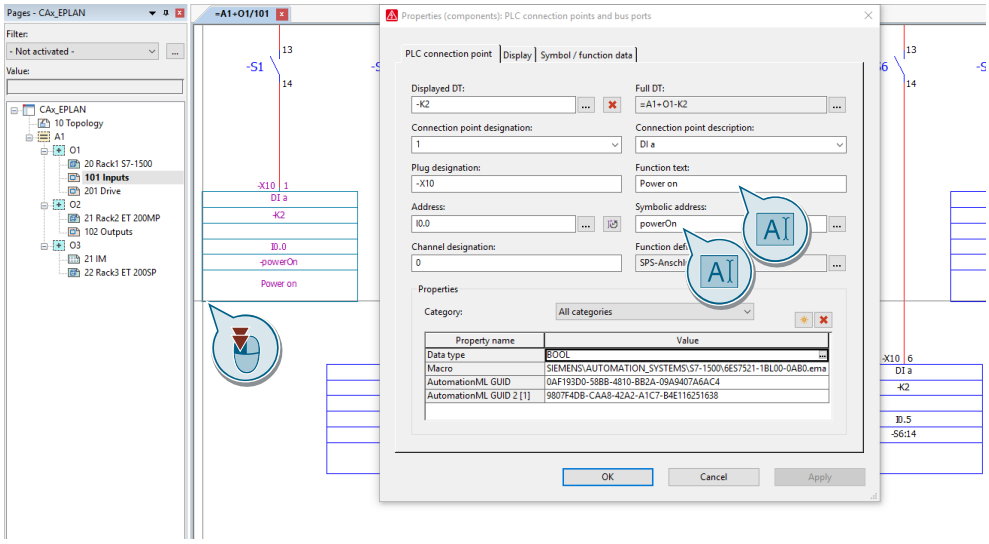
1. Start the symbolic addressing with "Project data > PLC > Addresses / allocation lists...". ("Project data > PLC > Addresses / assignment lists...").
2. Select the data type and enter the symbolic address with function text (comment).
3. Confirm your entries with "Apply" or "OK".

Figure 2-28 Addresses / allocation lists



Alternatively, you can also assign the symbolic addresses to the individual inputs and outputs in the circuit diagrams. Open the "Properties" of a channel of an input/output module and enter the symbolic address with function text (comment).

Figure 2-29 Symbolic addressing in the circuit diagram



2.2.5 Export EPLAN project for TIA Portal

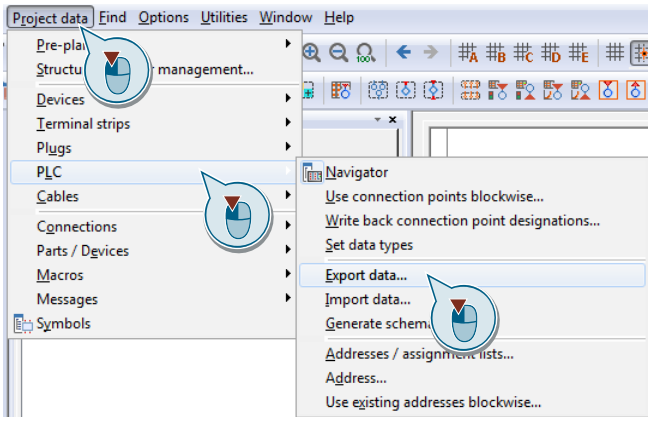
Note

Only devices that are assigned to a configuration project can be exported to an AML file. Several configuration projects can also exist within one EPLAN Electric P8 project.

To export an EPLAN project as an AML file for TIA Portal, proceed as follows:

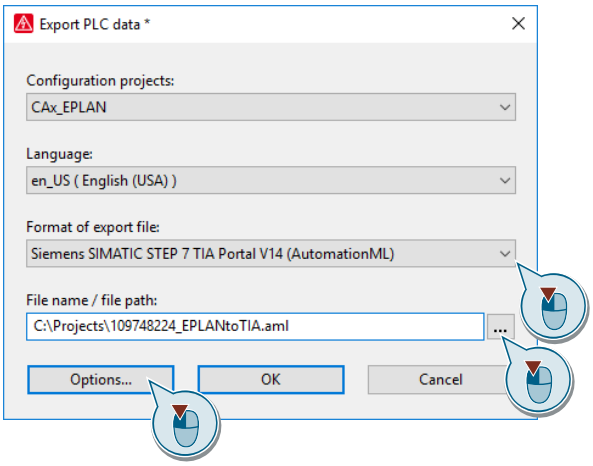
1. Open the EPLAN Electric P8.
2. Switch to the project view.
3. Select in the menu bar "Project data > PLC > Export data" ("Project data > PLC > Export data...").

Figure 2-30 Export EPLAN project



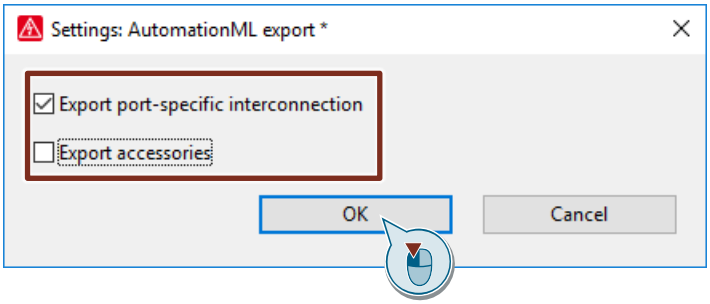
4. Select "Siemens SIMATIC STEP 7 TIA Portal V14 (AutomationML)" under "Format of export file" and define a file name.

Figure 2-31 Export EPLAN project



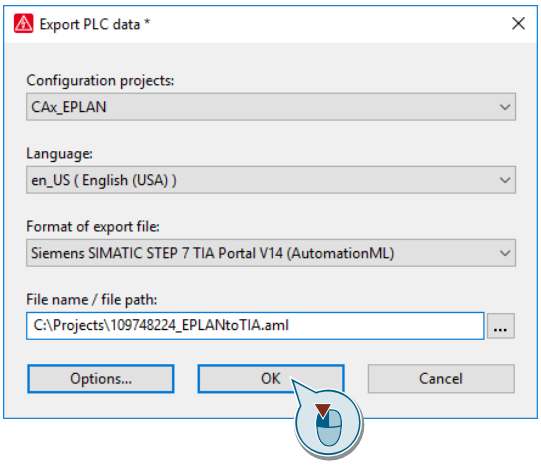
5. Click on the "Options..." button. ("Options...").
6. Check "Export port-specific interconnection". Remove the check "Export accessories", since no accessories are parameterized in the TIA portal. Click on "OK".

Figure 2-32 Export EPLAN project



7. Click on "OK".

Figure 2-33 Export EPLAN project

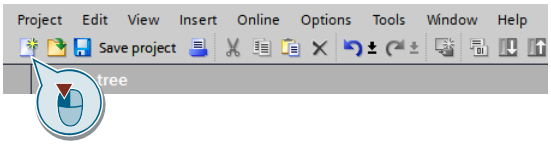


2.2.6 Import AML File into TIA Portal Project

Proceed as follows to import an EPLAN project as an AML file into the TIA Portal.

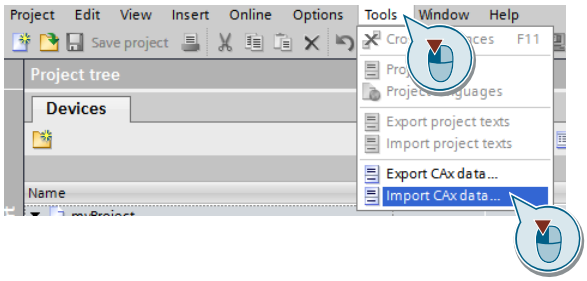
1. Open the TIA Portal.
2. Switch to the project view.
3. Click on the "New project" button.

Figure 2-34 Creating a TIA Portal Project



4. Specify the storage path and file name. Click on the "Create" button.
5. Click on "Tools > Import CAx data..." in the menu bar. ("Tools > Import CAx data...").

Figure 2-35 Import AML file from EPLAN



6. Navigate to the AML file exported from EPLAN and click "Open".

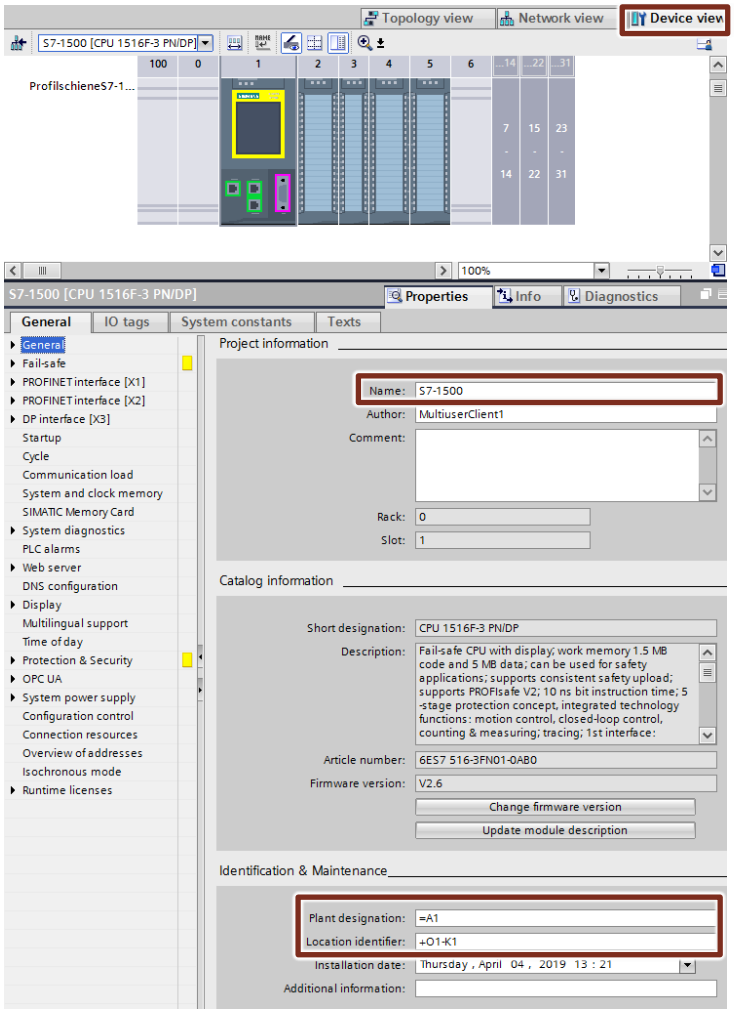
Result

After importing the AML file, the following data is imported into the TIA Portal.

Hardware configuration

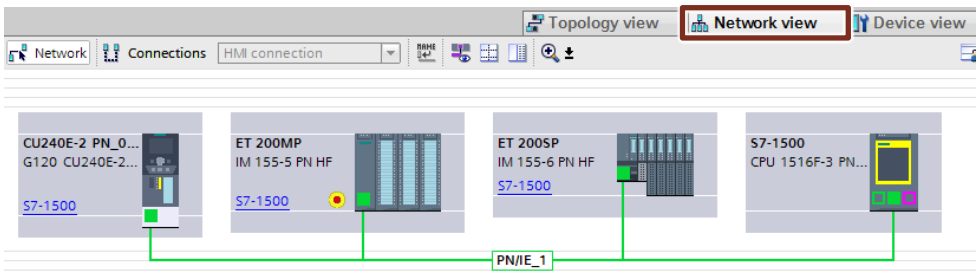
- Device configuration
- Device name
- Plant designation
- Location designation

Figure 2-36 TIA Portal Device View



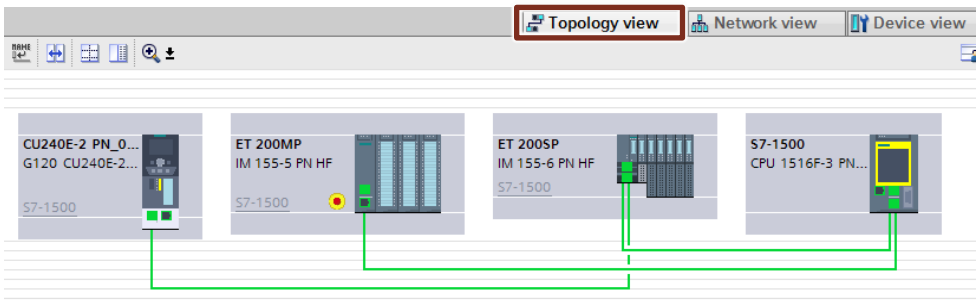
Logical network configuration

Figure 2-37 TIA Portal network view



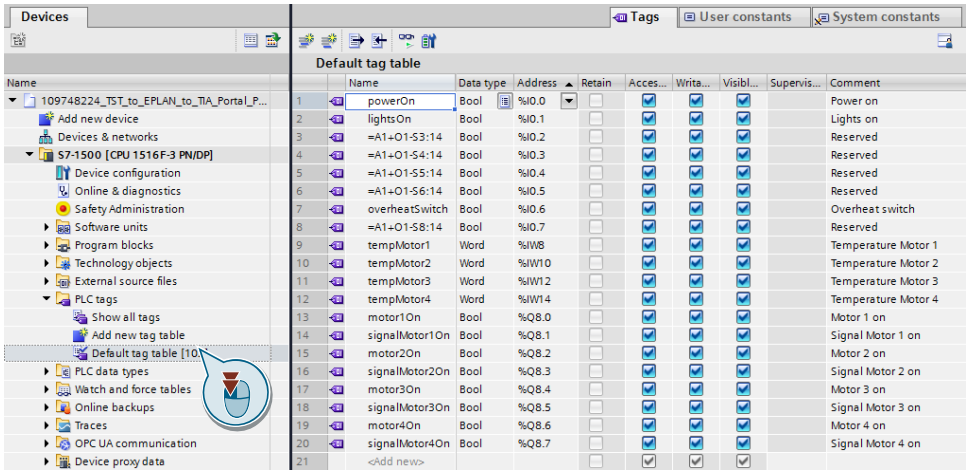
Topological network configuration

Figure 2-38 TIA Portal topology view



PLC variables of inputs and outputs with comments

Figure 2-39 TIA Portal variable table



3 Appendix

3.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:
support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:
www.siemens.com/industry/supportrequest

SITRAIN – Training for Industry

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:
www.siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:
support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:
support.industry.siemens.com/cs/ww/en/sc/2067

3.2 Links and literature

Table 3-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the entry page of the application example https://support.industry.siemens.com/cs/ww/en/view/109748224
\3\	TIA Selection Tool http://www.siemens.com/tst
\4\	TST cloud http://www.siemens.com/tstcloud
\5\	EPLAN Electric P8 2.8 https://www.eplan.de/en/start/
\6\	MS SQL Server 2014 Express https://www.microsoft.com/
\7\	CAX downloads from Siemens automation components: https://support.industry.siemens.com/My/ww/en/CAxOnline
\8\	AutomationML Editor https://www.automationml.org
\9\	System manual SIMATIC Openness Automate project creation Chapter "Export/Import > Importing/ Exporting Hardware Data > Exporting CAx Data https://support.industry.siemens.com/cs/ww/en/view/109477163/108835689227
\10\	AWB "Integration of planning data from TIA Selection Tool into TIA Portal" https://support.industry.siemens.com/cs/ww/en/view/109748223
\11\	FAQ "Which EPLAN data are required for AML data exchange?" FAQ "Which EPLAN data are required for AML data exchange? https://support.industry.siemens.com/cs/ww/en/view/109766653
\12\	FAQ "How do I work with Siemens EPLAN macros ET 200SP? https://support.industry.siemens.com/cs/ww/en/view/109766667

3.3 Change documentation

Table 3-2

Version	Date	Change
V1.0	09/2017	First version
V2.0	06/2019	New workflow: TST → EPLAN → TIA Portal