

Commissioning of CMMO-ST-C5-1-LKP in I-Port mode with CTEU-PN and CAPC-F1-E-M12 via TIA Portal V13

The application node contains a step by step explanation how to configure a CMMO-ST-C5-1-LKP in I-Port mode with CTEU-PN and CAPC-F1-E-M12 via TIA Portal V13

CMMO-ST-...-LKP

Title .. Commissioning of CMMO-ST-C5-1-LKP in I-Port mode with CTEU-PN and CAPC-F1-E-M12 via TIA Portal V13
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1 Components/Software/ IP address used

Type/Name	Version Software/Firmware	IP address
CMMO-ST-C5-1-LKP	1.4.0.8	192.168.10.11
Siemens S7-1500 PLC Type 1516F-3 PN/DP	1.8	192.168.10.10
TIA Portal V13	V13 SP1 Update7	--
EMMS-ST-42-S-SE-G2	general	--
Festo Configuration Tool	1.2.1	--
CMMO-ST Plugin	01.04.00	--
CTEU-PN	REV 1	192.168.10.12
CAPC-F1-E-M12	REV 1	--

Table 1.1: 1 Components/Software used

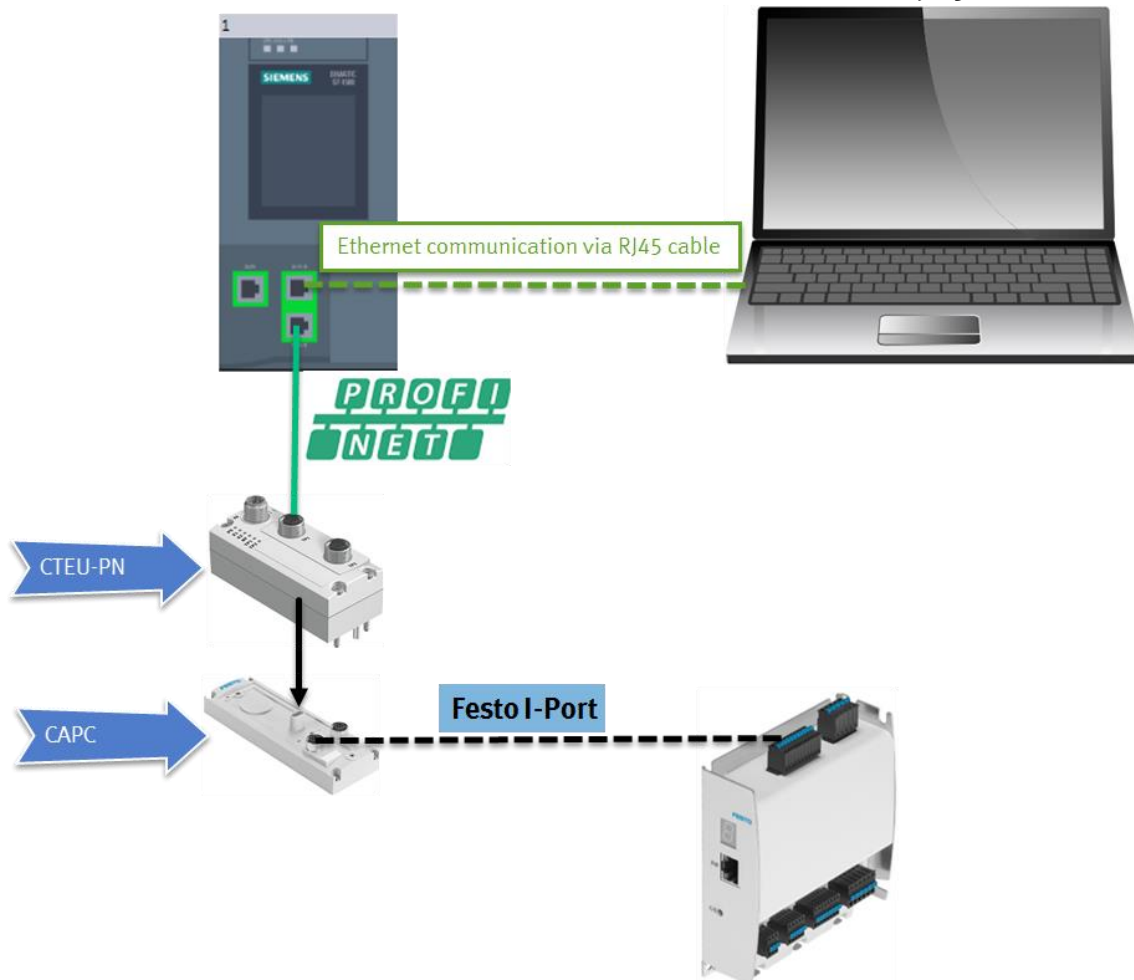


Note:

Festo I-Port is IO-Link with restrictions

1.1 Topology

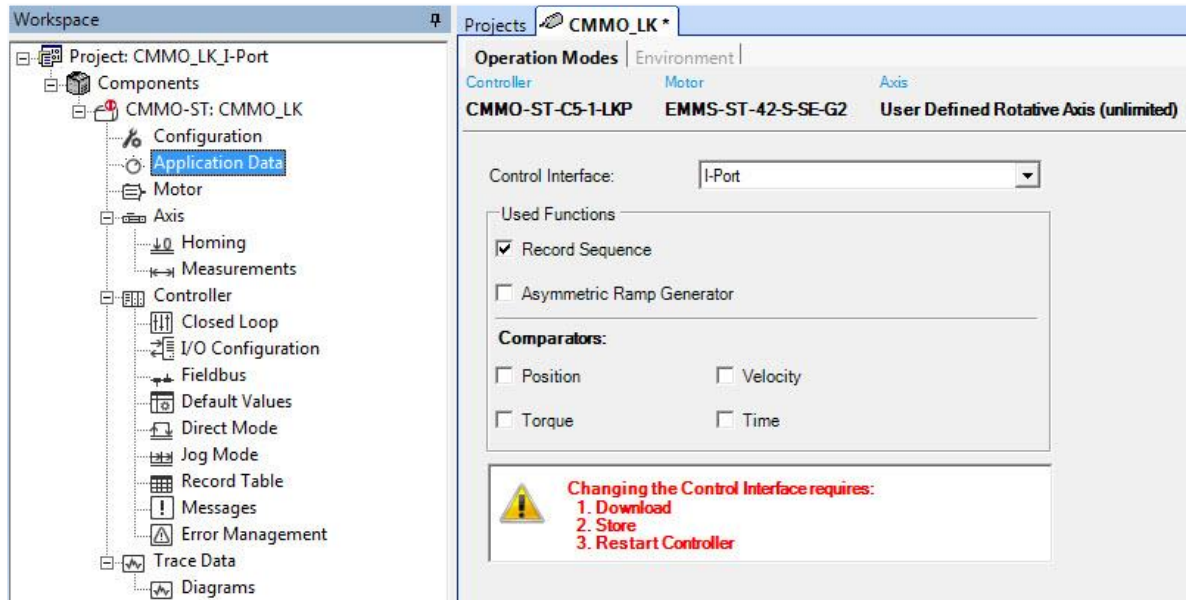
The CMMO-ST-C5-1-LKP is connected via a I-Port to the first port of CAPC-F1-E-M12. The CTEU-PN is connected to the CAPC-F1-E-M12 and communicated via Profinet to the X1 Port of the Siemens S7-1500 PLC



2 Important FCT settings for I-Port

2.1 Application data

The Control Interface contains the communication protocol of the CMMO-ST-C5-1-LKP. To establish a I-Port communication it has to be set to:



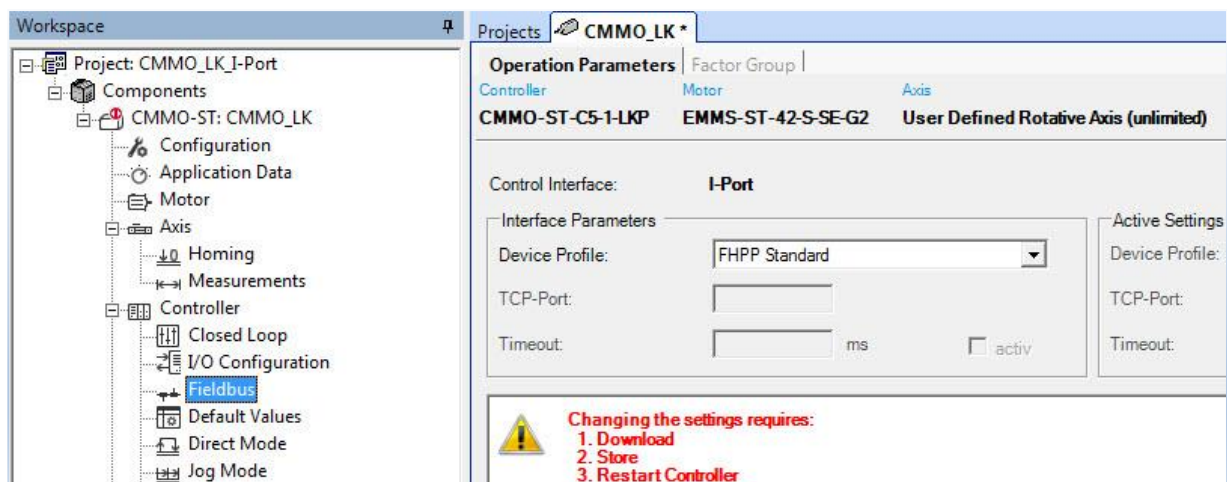
2.2 Fieldbus

The Fieldbus settings contain Device Profile. Important is the Control interface setting, because with a CMMO-ST-C5-1-LKP you can handle FHPP (8 Byte I/O process data) or FHPP+FPC (16 Byte I/O process data).



More information concerning FHPP:

https://www.festo.com/net/SupportPortal/Files/425143/CMMO-ST-LK-C-HP_2015-07a_8043629g1.pdf



3 Commissioning in TIA Portal V13

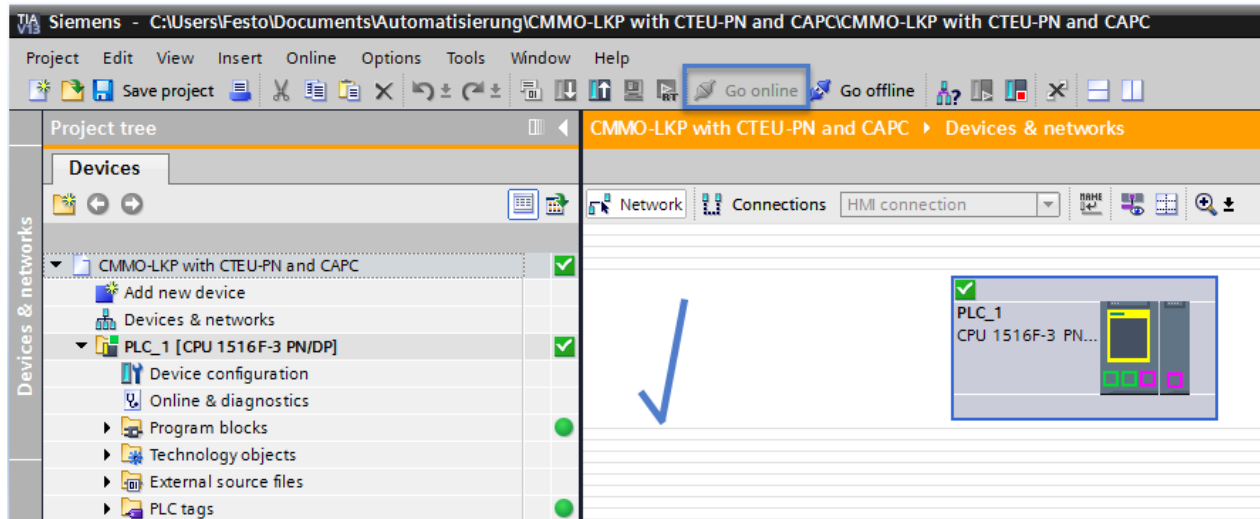
3.1 Key requirements

3.1.1 You have created a new TIA Portal project with no error
















Note:

Go Online to check the status of your PLC.

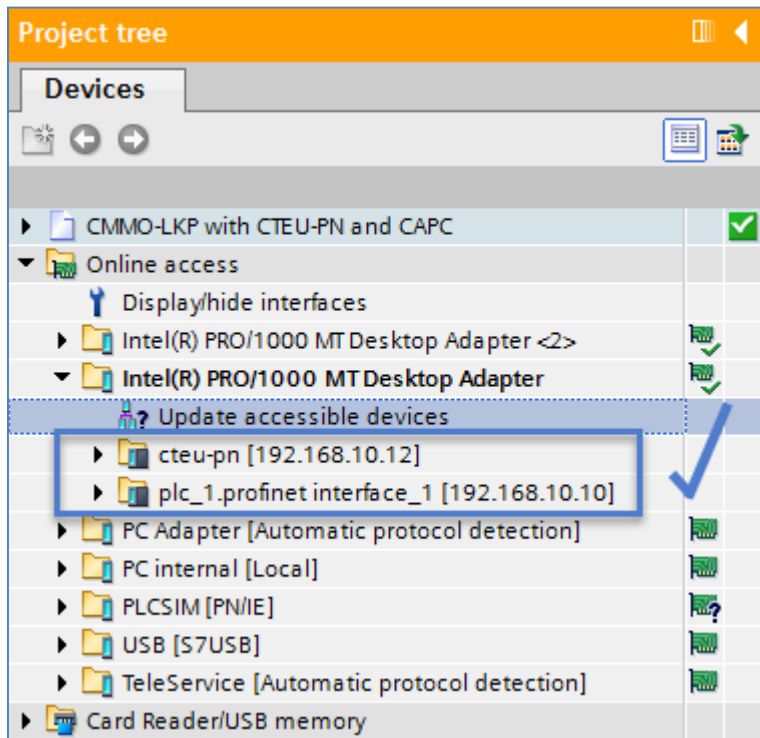


3.1.2 Except the NF LED (Network failure) following LED's are green of the CTEU-PN

CTEU device status			
PS	Power for system and valves/device		Power supply for electronic and valves OK
			Undervoltage for valves or outputs
			No power supplied
X1	Internal connection of bus module with valve terminal or device. X2 just used if second device connected		Bus module connected to valve terminal or device. Everything OK.
X2			Valve terminal or device has diagnostics (Can be read out via fieldbus)
			I-Port communication failure
			Failure at bus module (Short circuit,..) (X1/X2) No device connected after power-on (X1/X2) HW configuration error
			No device connected to bus module
Device network status			
NF	Network failure		Communication error
			Normal operating status
TP1	Link status		Network connection is ok
TP2			Both LEDs, TP1 and TP2 flash green: - To locate the connected product
			No network connected

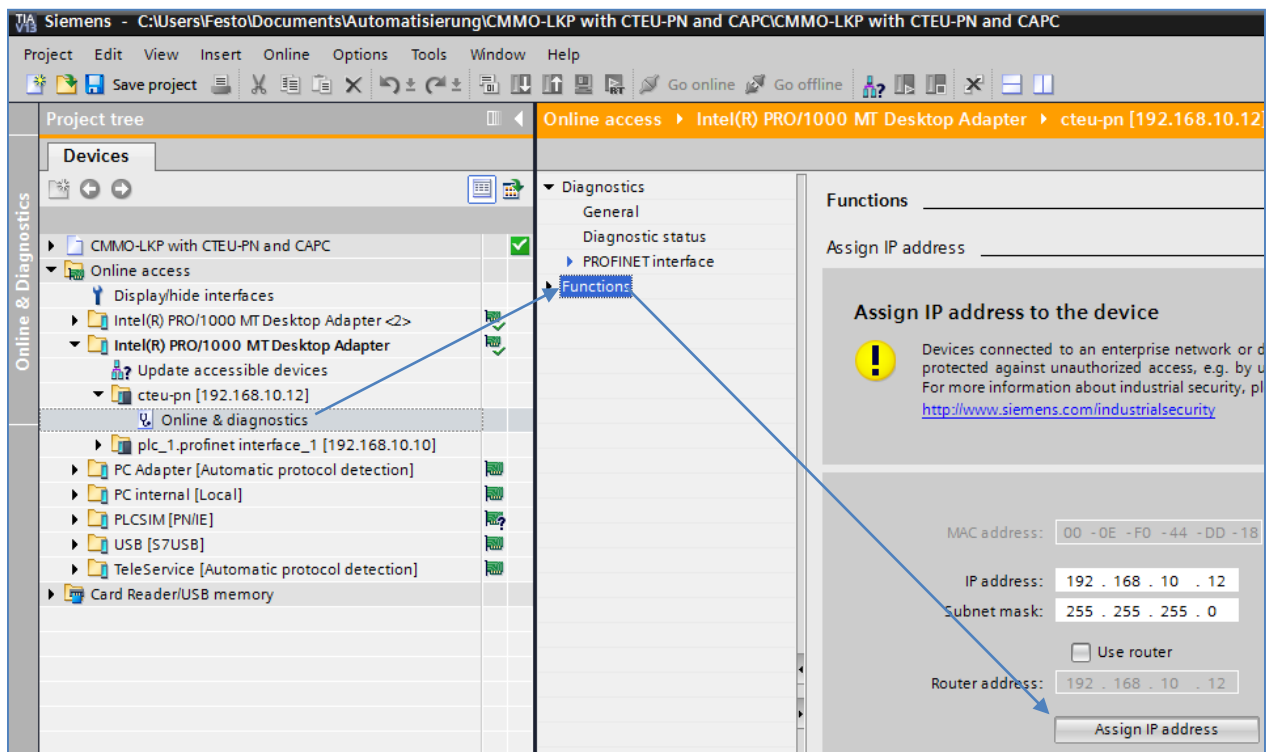
3.1.3 Be sure that you are in the same IP range

Check via TIA Online access the settings of the CTEU-PN node



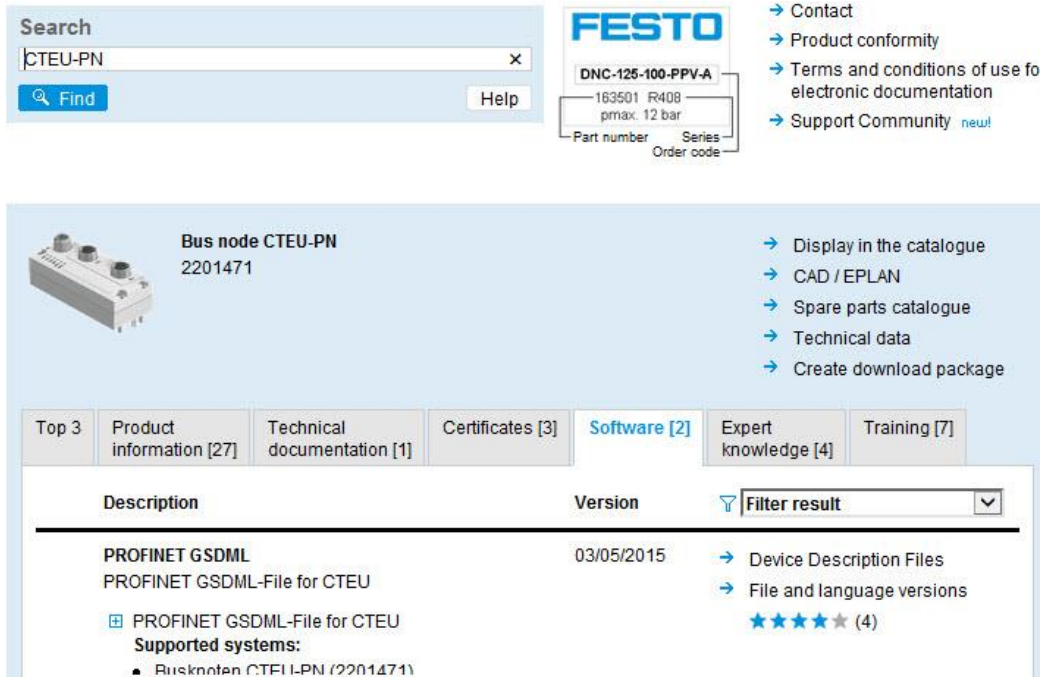
Note:

You can change the address in TIA Portal via following function



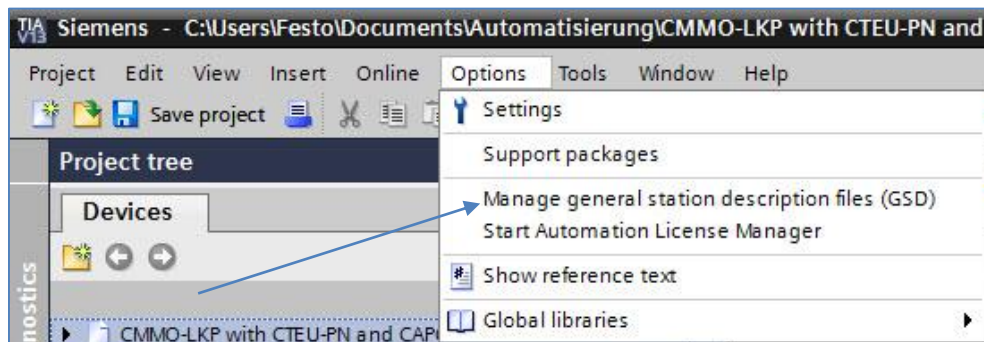
3.2 Establish a Profinet connection to CMMO-ST-C5-1-LKP

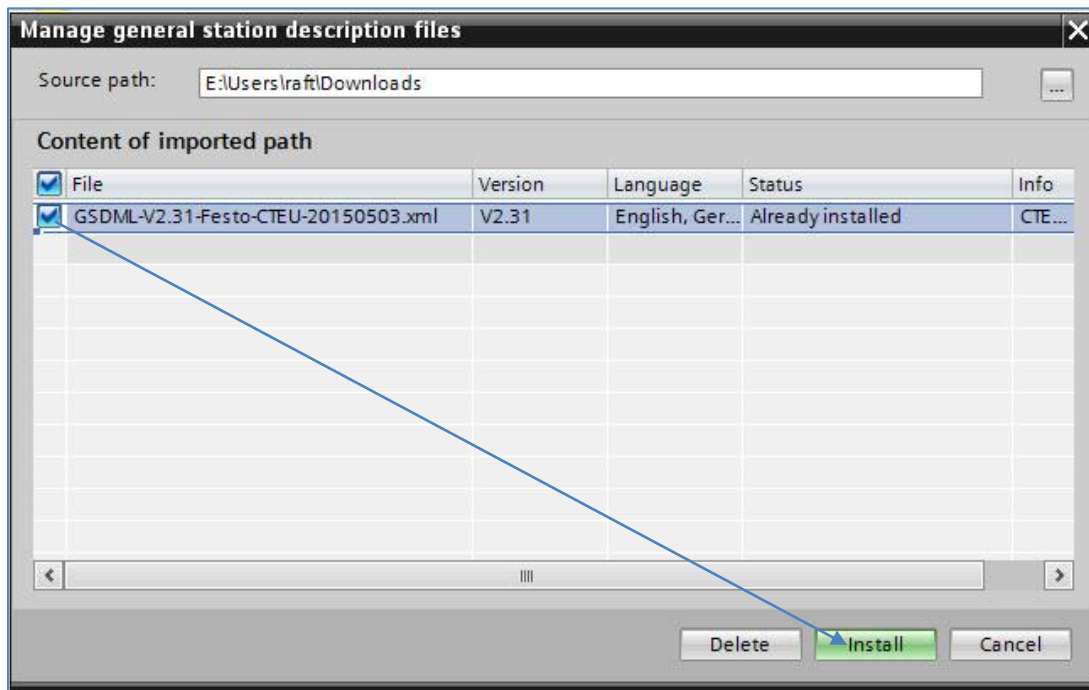
3.2.1 Download the GSDML file from the Festo Support Portal



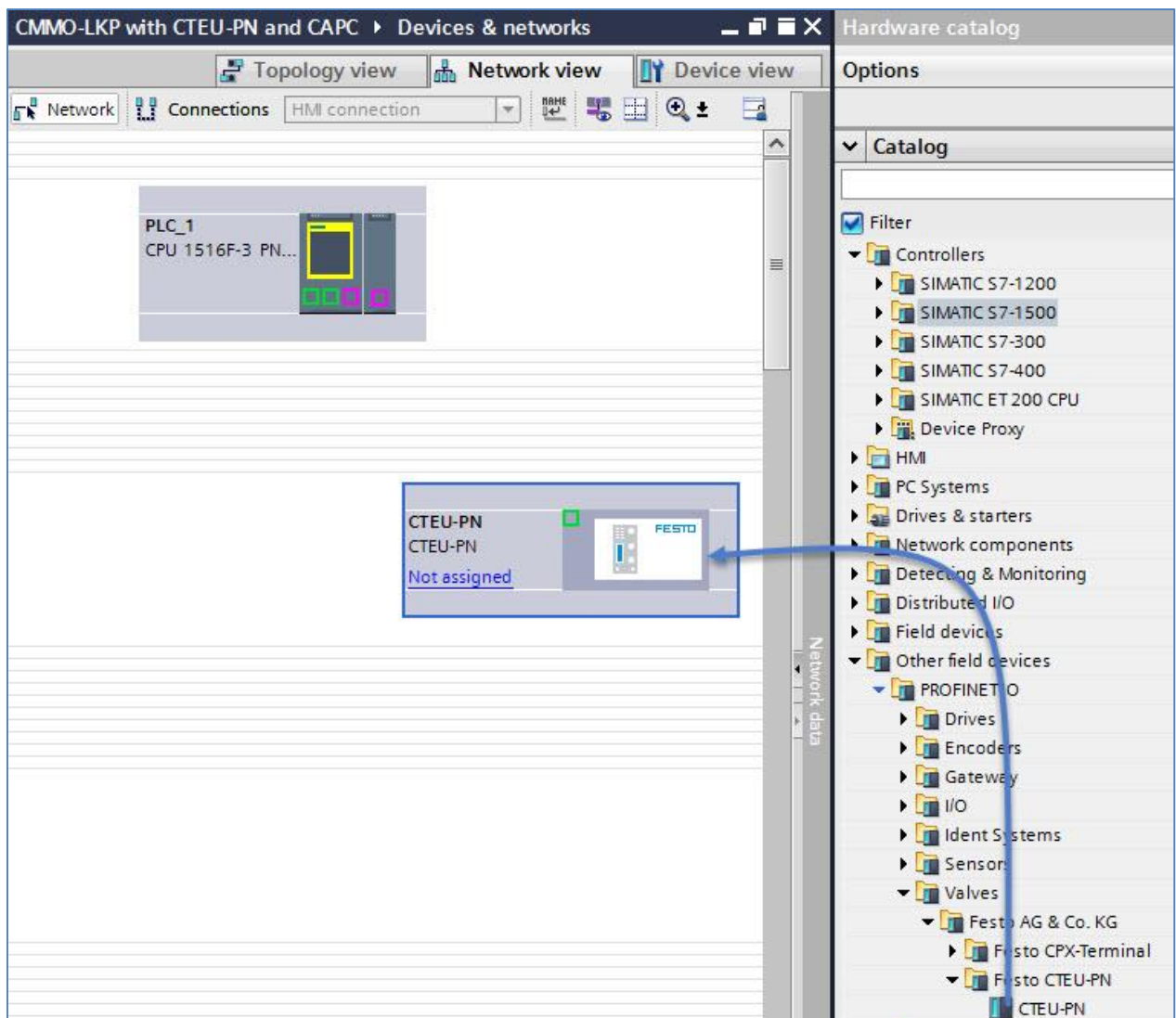
The screenshot shows the Festo Support Portal search results for the product CTEU-PN. The search bar at the top left contains the text "CTEU-PN" and a "Find" button. To the right of the search bar is a Festo logo and a product code "DNC-125-100-PPV-A" with a breakdown: "163501 R408 pmax. 12 bar". Below the search bar is a "Help" button. On the right side of the search results, there are links: "Contact", "Product conformity", "Terms and conditions of use for electronic documentation", and "Support Community new!". Below the search bar is a product image of a "Bus node CTEU-PN 2201471". To the right of the product image are links: "Display in the catalogue", "CAD / EPLAN", "Spare parts catalogue", "Technical data", and "Create download package". Below the product image is a table with tabs: "Top 3", "Product information [27]", "Technical documentation [1]", "Certificates [3]", "Software [2]", "Expert knowledge [4]", and "Training [7]". The "Software [2]" tab is selected. The table has columns "Description" and "Version". The first row is "PROFINET GSDML" with version "03/05/2015". The description includes "PROFINET GSDML-File for CTEU" and "PROFINET GSDML-File for CTEU". The supported systems are listed as "Busknoten CTEU-PN (2201471)". To the right of the table are links: "Device Description Files", "File and language versions", and a star rating "★★★★★ (4)".

3.2.2 Install the GSDML file in TIA Portal

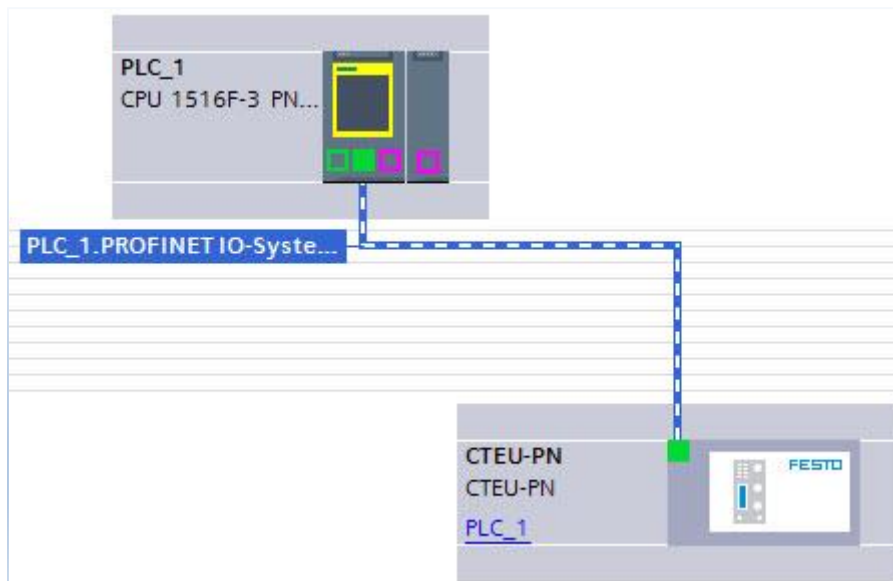




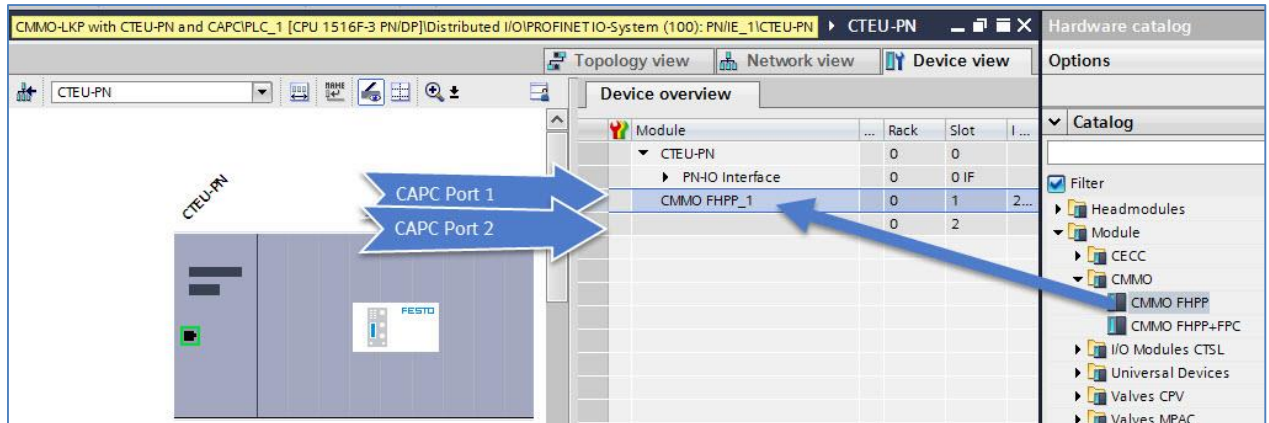
3.2.3 Drag and Drop the CTEU-PN entry to Device & networks -> Network view



3.2.4 Assign the CTEU-PN to the Siemens PLC

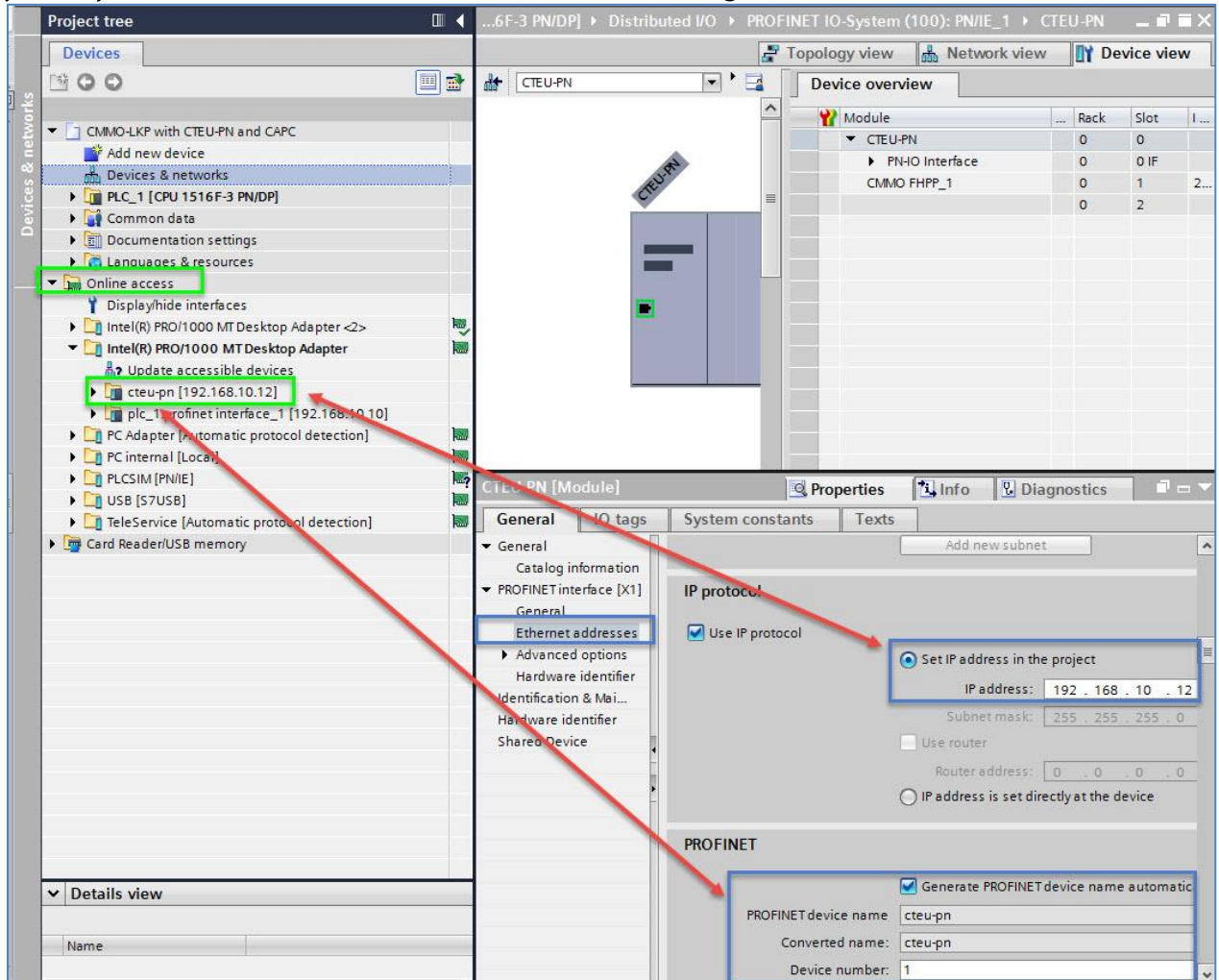


3.2.5 Configure the CTEU-PN in Device view

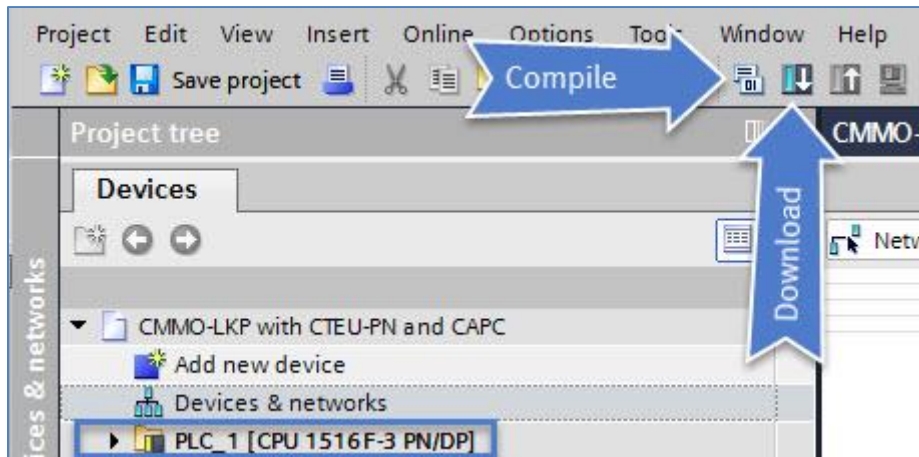


3.2.6 Some Siemens PLC's don't assign the IP address and Profinet device name automatically.

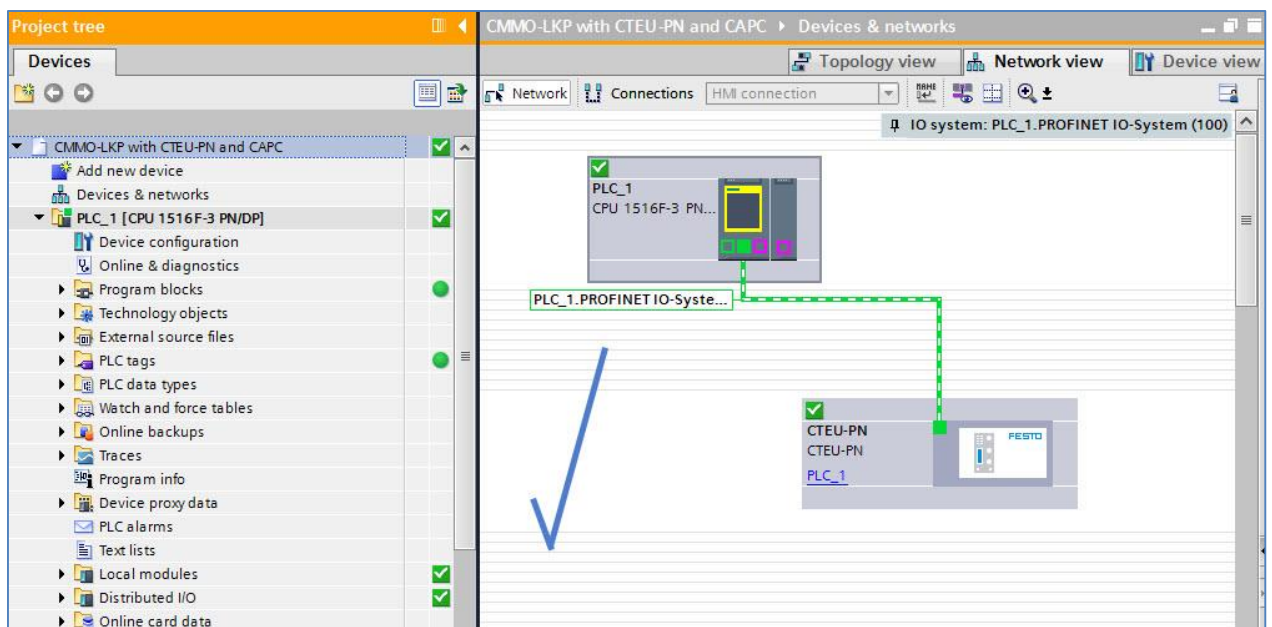
For an error free communication it is a must that the Profinet name & IP address in the Offline project is equal to the Online information. Please check it and if wrong then correct it.



3.2.7 Compile and Download the project




3.2.8 Go online to check the status of the devices



3.3 Install the Festo TIA Portal library for the CMMO-ST-C5-1-LKP

3.3.1 Download the Library from the Festo Support Portal



Motor controller CMMO-ST-C5-1-LKP
1512320

→ Quick Start Guide, CMMO-ST-...-LKP

→ Display in the catalogue

→ CAD / EPLAN

→ Spare parts catalogue

→ Technical data

→ Create download package

Top 3

Product information [19]

Technical documentation [8]

Certificates [4]




Software [11]

Expert knowledge [14]

Training [1]



Description	Version	
<div style="border: 1px solid #0070C0; padding: 2px; display: inline-block;"> Function blocks [5] </div>		
Funktionsbausteine CODESYS FHPP Function blocks for motor controllers - Codesys V3.5 FHPP library for Codesys PLC in version 3.5 (also Beckhoff TwinCAT 3) to communicate with the following motor controllers:	3.5.5.0 01/03/2016	<p>→ Function blocks</p> <p>→ File and language versions</p> <p>★★★★★ (6)</p>
Funktionsbausteine CODESYS FHPP function blocks for motor controllers - Codesys 2.3 FHPP library for Codesys PLC in version 2.3 (also Beckhoff TwinCAT 2) to communicate with the following motor controllers:	2.3.1.2 25/02/2016	<p>→ Function blocks</p> <p>→ File and language versions</p> <p>★★★★★ (1)</p>
Function blocks Rockwell RSLogix 5000 FHPP Library for Rockwell PLC Supported systems: <ul style="list-style-type: none"> Motor controller CMMD-AS-C8-3A (561406) Motor controller CMMO-ST-C5-1-LKP (1512320) 	2.2 22/02/2016	<p>→ Function blocks</p> <p>→ File and language versions</p> <p>★★★★★ (1)</p>
Function blocks Siemens Step 7 FHPP library for SIEMENS PLC Function blocks for SIEMENS STEP 7 V5.5 (FHPP Version 5.5.0.8) to use with S7-300 and S7-400 and TIA Portal V13 SP1 (FHPP Version 13.0.11) to use with S7-1200 and S7-1500	3.1 07/12/2015	<p>→ Function blocks</p> <p>→ File and language versions</p> <p>★★★★★ (14)</p>

3.3.2 After executing the EXE following folders appear

Name	Änderungsdatum	Typ	Größe
 STEP7_V5_5_0_8	18.04.2016 13:30	Dateiordner	
 TIA_V13_0_11	18.04.2016 13:30	Dateiordner	
 FHPP_MotionLib_Siemens_V3_1.exe	18.04.2016 13:29	Anwendung	11.071 KB

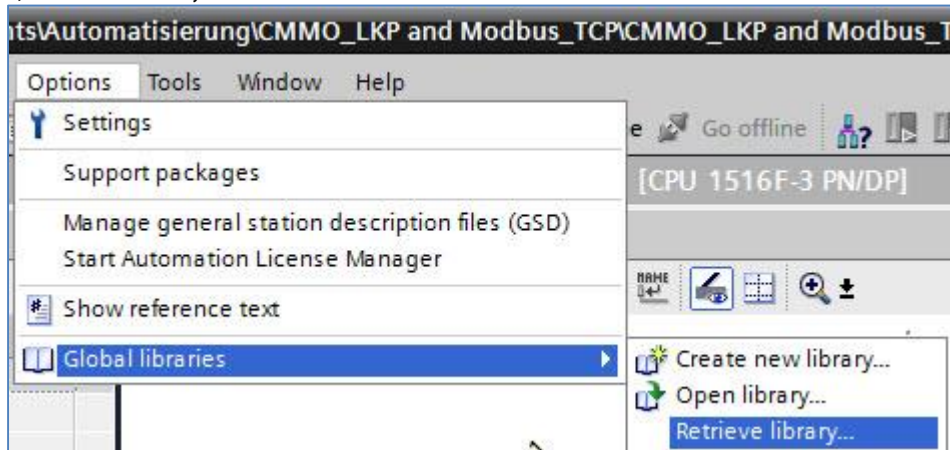

Note:

In the TIA folder you find a detailed documentation concerning the Library

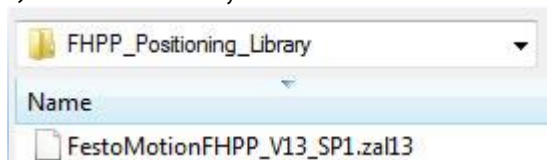
Name
 Festo_Motion_FHPP_TIA_V13_SP1_DE.pdf
 Festo_Motion_FHPP_TIA_V13_SP1_EN.pdf

3.3.3 Install the Festo_Motion_FHPP library in TIA Portal

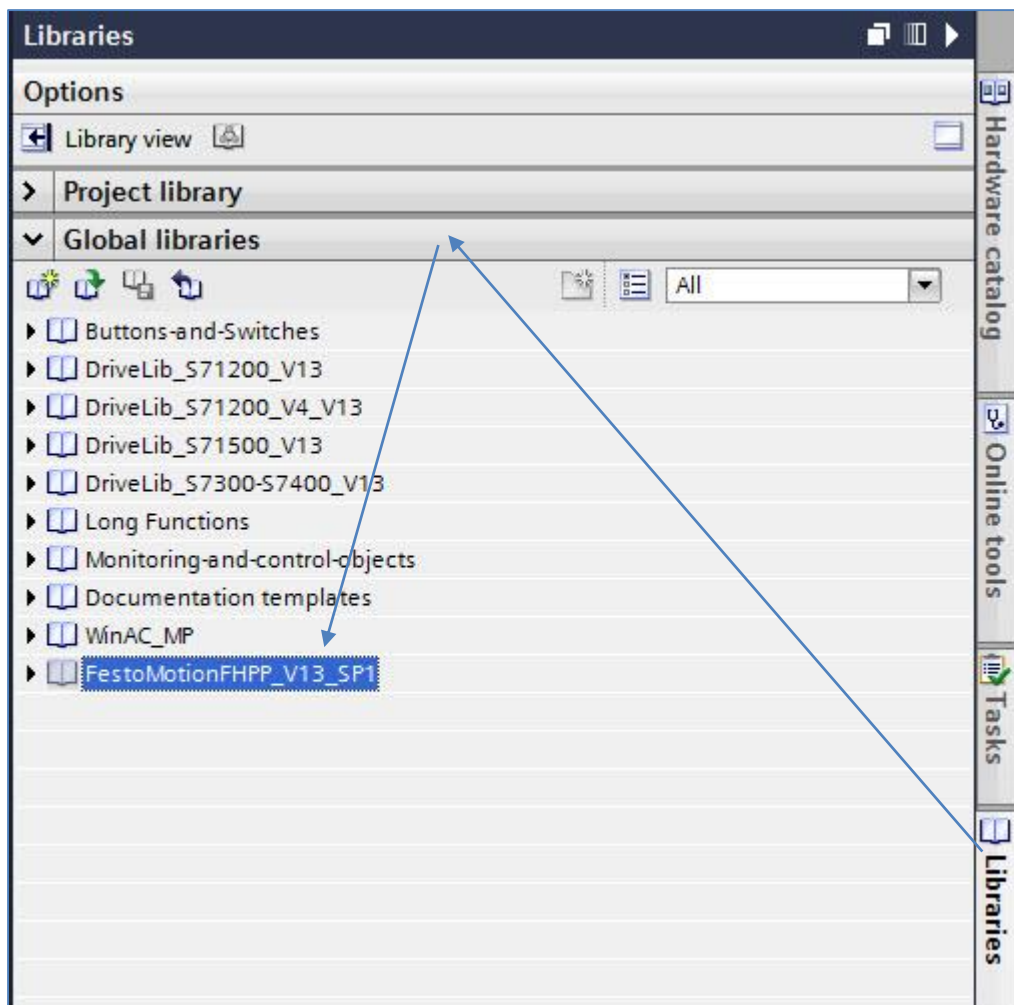
1) Retrieve library



2) Choose the library

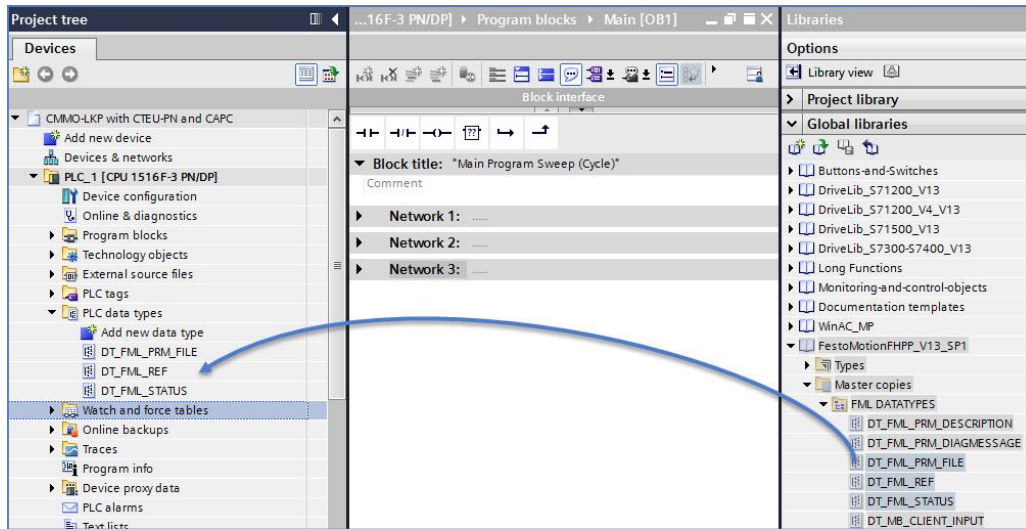


3) After installation the library appears in TIA Portal project:

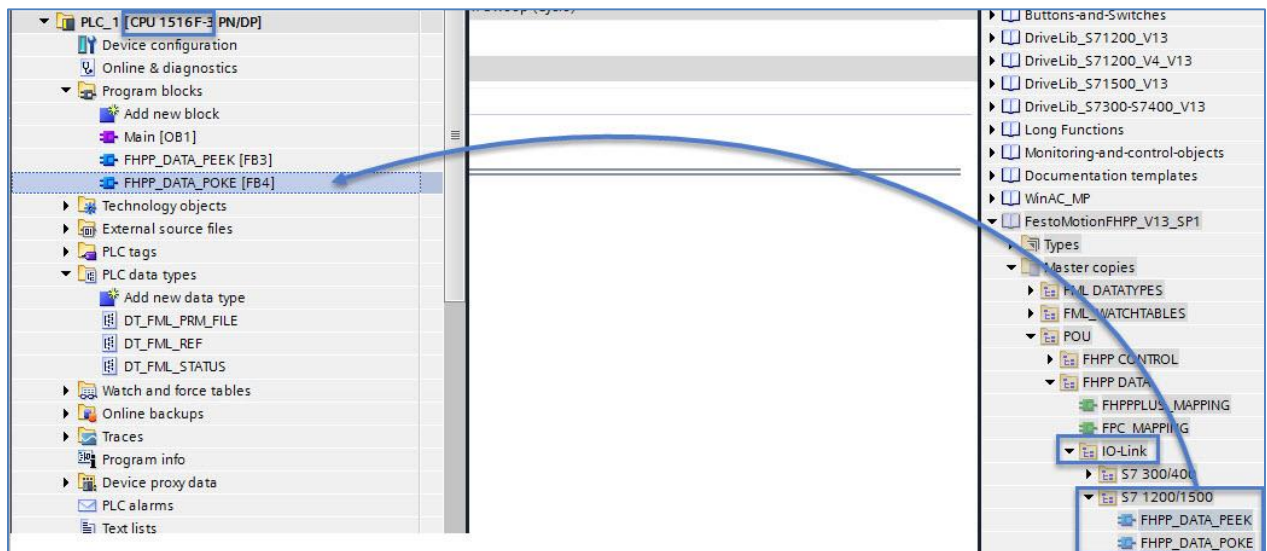


3.4 Drag and drop the right I-Port (IO-Link) entries from the library

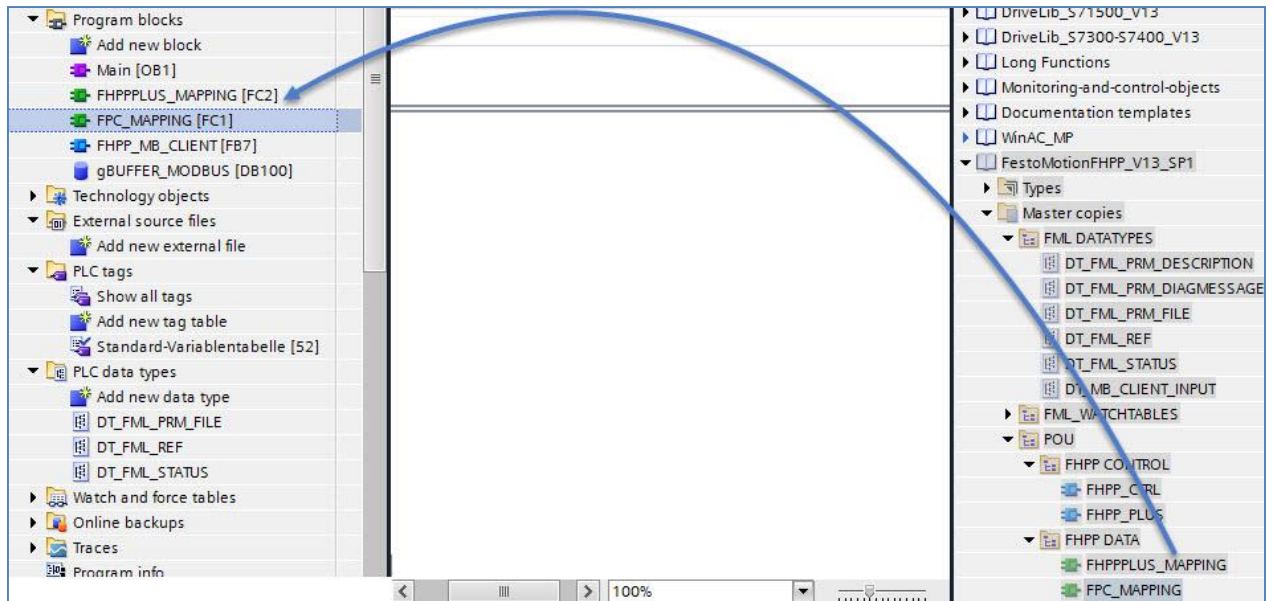
3.4.1 Add the necessary data types to the project



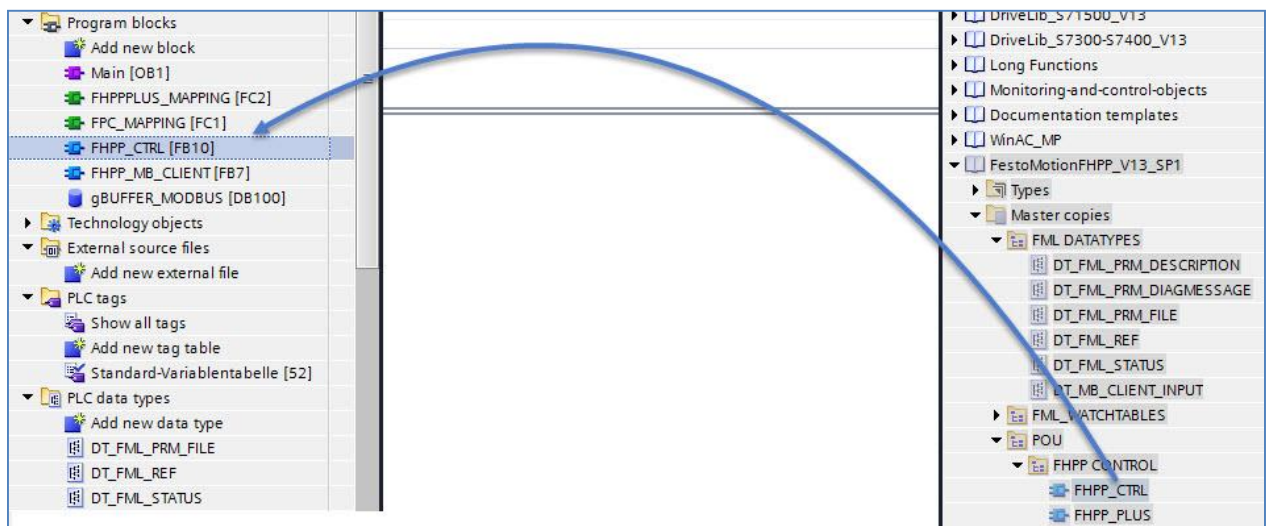
3.4.2 Add the I-Port function blocks to the project



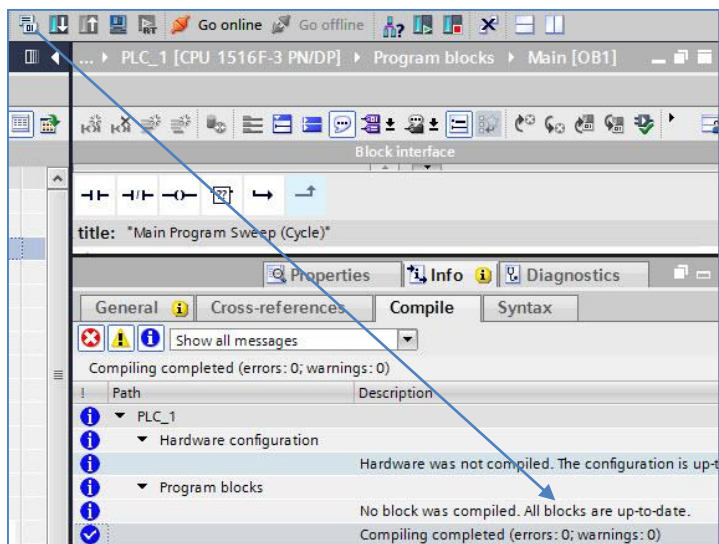
3.4.3 Add the FHPP DATA functions to your project



3.4.4 Add the FHPP_CTRL Function block to your project

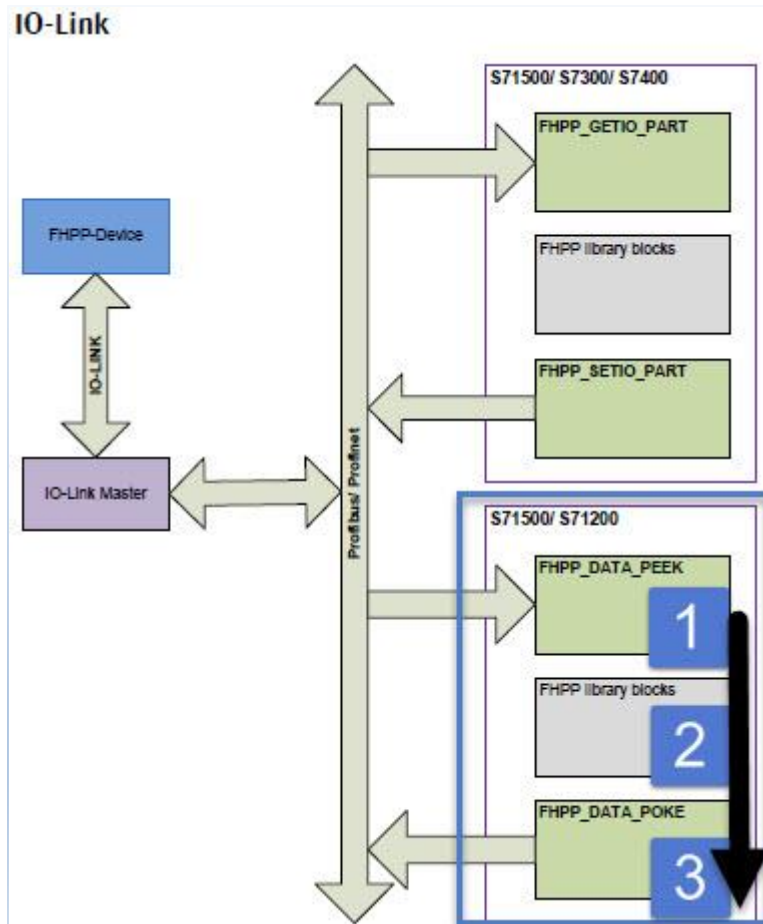


3.4.5 Compile the project

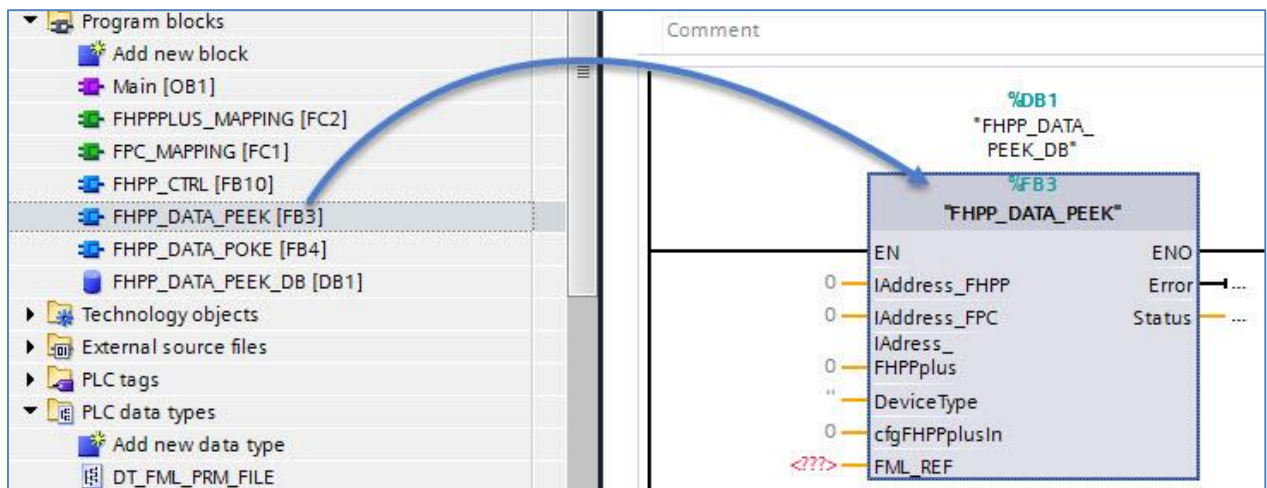


3.5 Create in OB1 I-Port (IO-Link) project

3.5.1 The recommended programming flow is

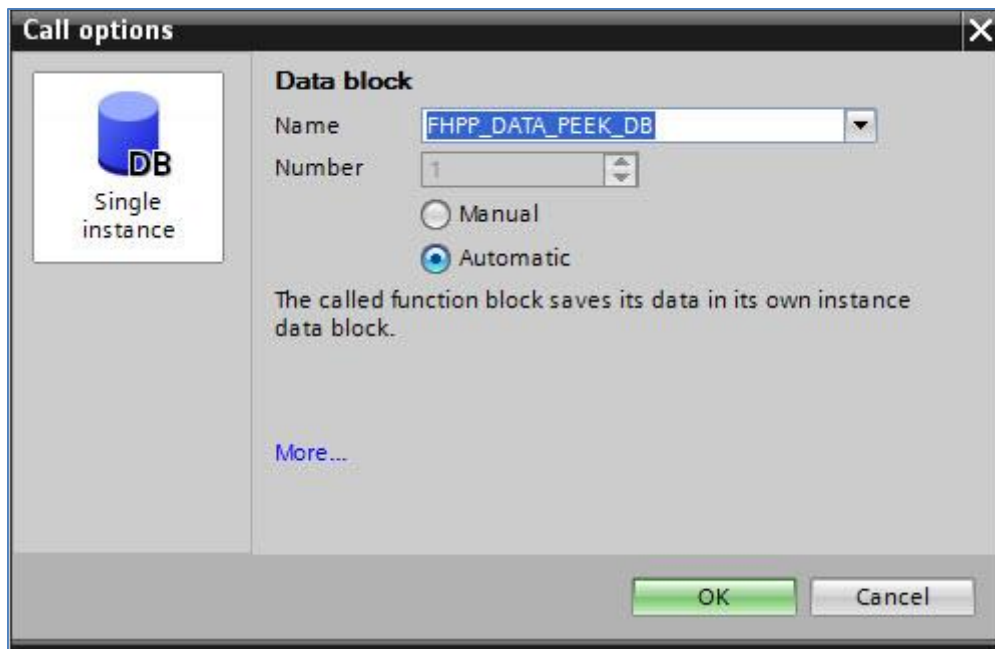


3.5.2 Add the FHPP_DATA_PEEK function block via drag & drop to your OB1 ladder program *Network 1*



**NOTE**

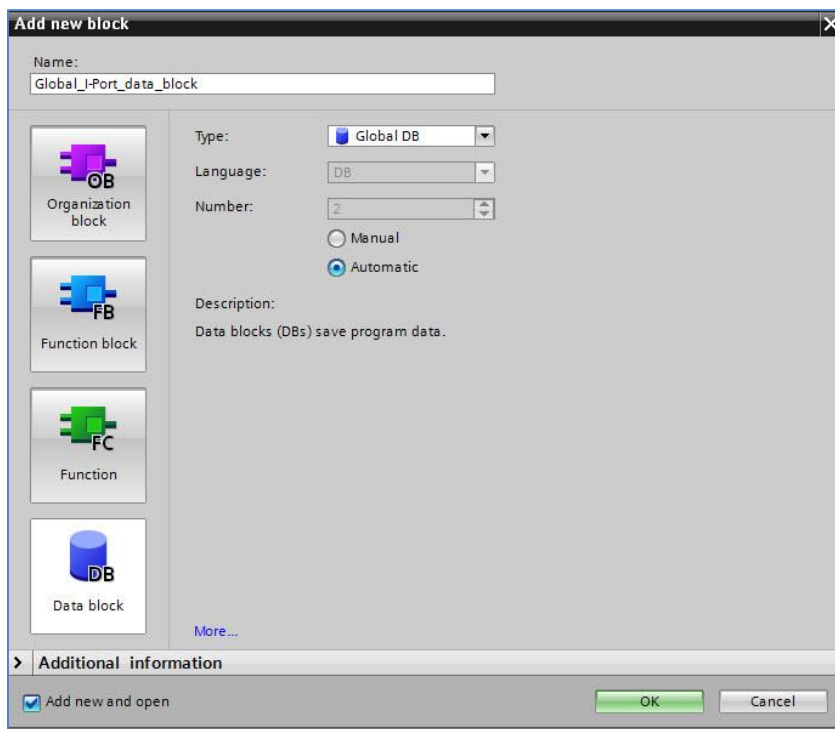
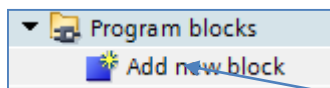
TIA generates a corresponding data block automatically



3.5.3 Create a global Data block with a FML_REF variable



Via the FML_REF variable you ensure that the used CMMO-ST-C5-1-LKP Modbus/TCP Function blocks are using the same references



PLC programming

▼ CMMO-LKP with CTEU-PN and CAPC

▼ Add new device

▼ Devices & networks

▼ PLC_1 [CPU 1516F-3 PN/DP]

▼ Device configuration

▼ Online & diagnostics

▼ Program blocks

▼ Add new block

Main [OB1]

FHPPPLUS_MAPPING [FC2]

FPC_MAPPING [FC1]

FHPP_CTRL [FB10]

FHPP_DATA_PEEK [FB3]

FHPP_DATA_POKE [FB4]

FHPP_DATA_PEEK_DB [DB1]

Global_I-Port_data_block [DB2]

Global_I-Port_data_block

	Name	Data type
1	▼ Static	
2	▶ CMMO_REF	"DT_FML_REF"
3	<Add new>	



Attention
→ **Compile everything again**

3.5.4 Parameterize the PEEK function block

Network 1:

Comment

Underline!

'CMMO_ST'

2

IAddress_FHPP

0

IAddress_FPC

0

IAddress_FHPPplus

0

FHPPplus

'CMMO_ST'

DeviceType

0

cfgFHPPplusIn

"Global_I-Port_data_block".

CMMO_REF

FML_REF

Note:

Topology view

Network view

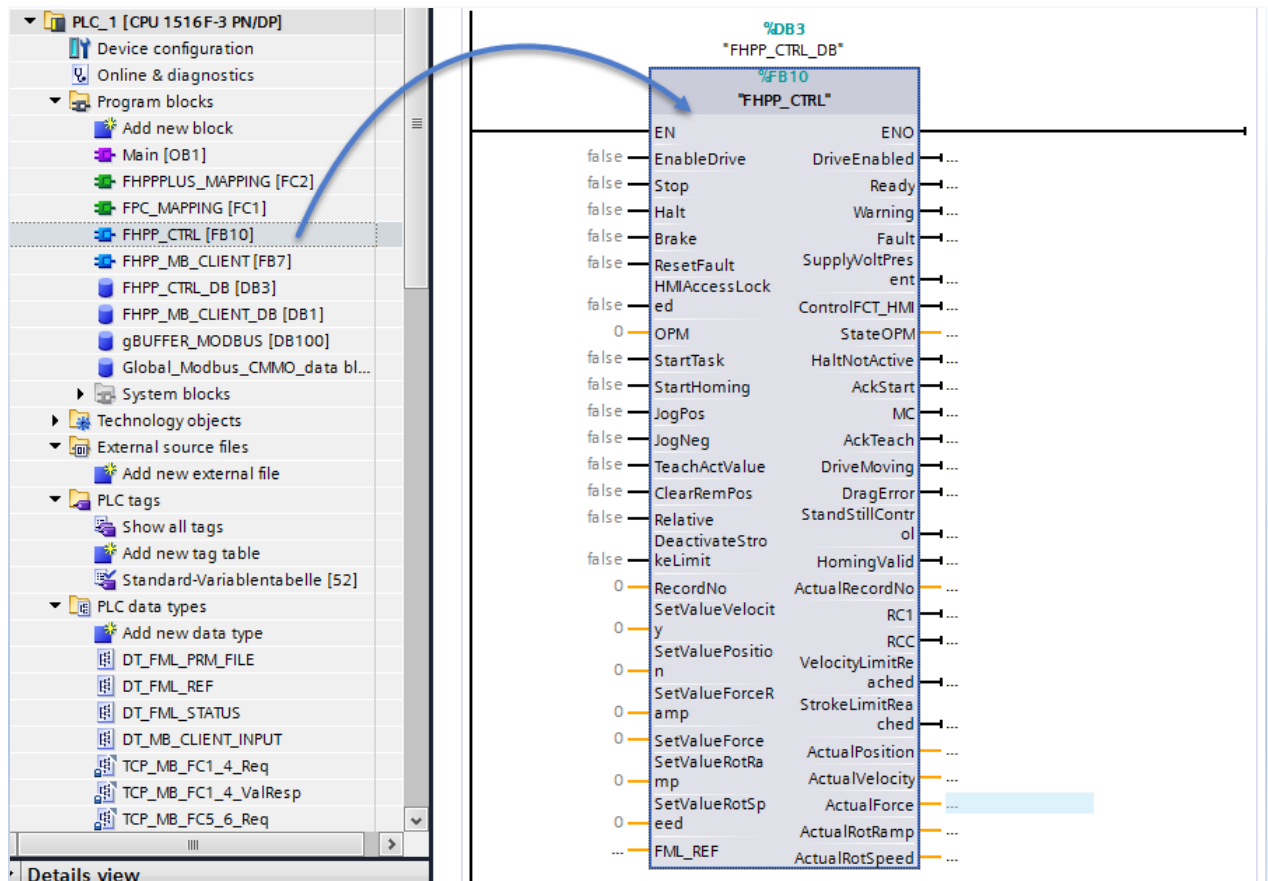
Device view

Device overview

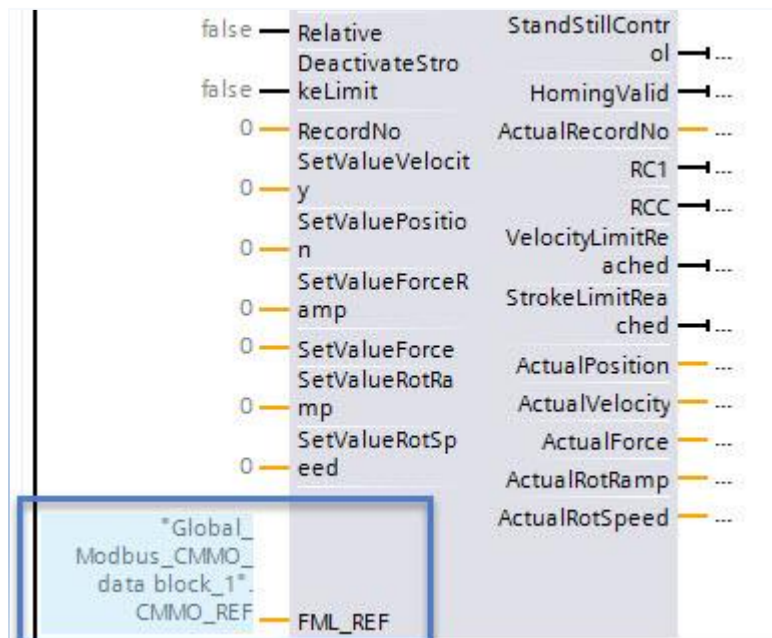
Module	Rack	Slot	I address	Q address	Type	Article number
CTEU-PN	0	0			CTEU-PN	2201471
PN-HO Interface	0	0	IF		CTEU-PN	
CMMO FHPP_1	0	1	2...9	2...9	CMMO FHPP	1512320
	0	2				

Start address for function block from CTEU-PN

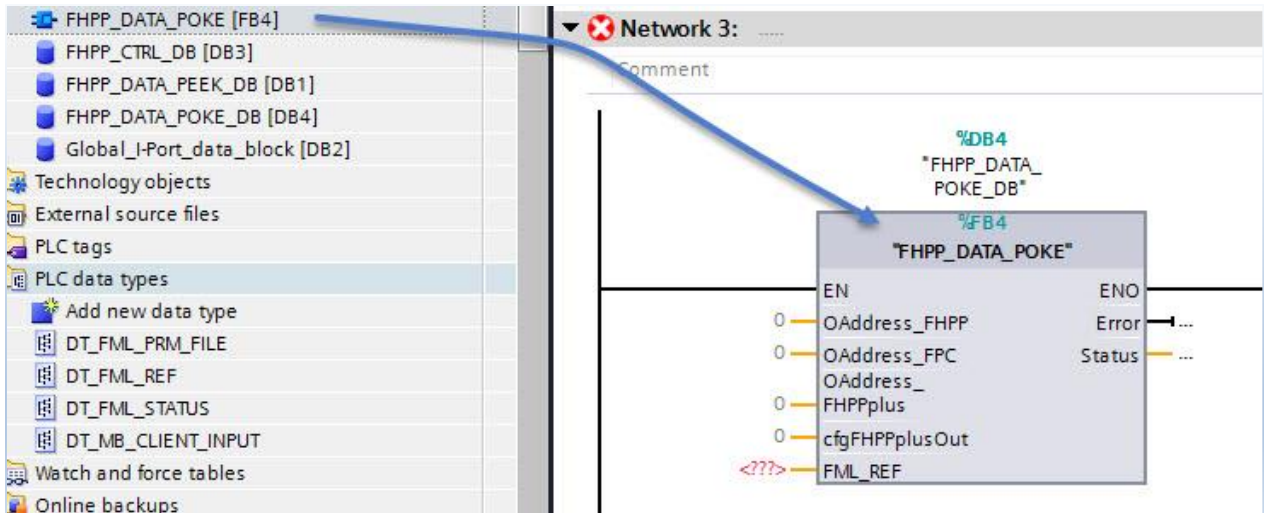
3.5.5 Add the FHPP_CTRL function block to *Network 2*



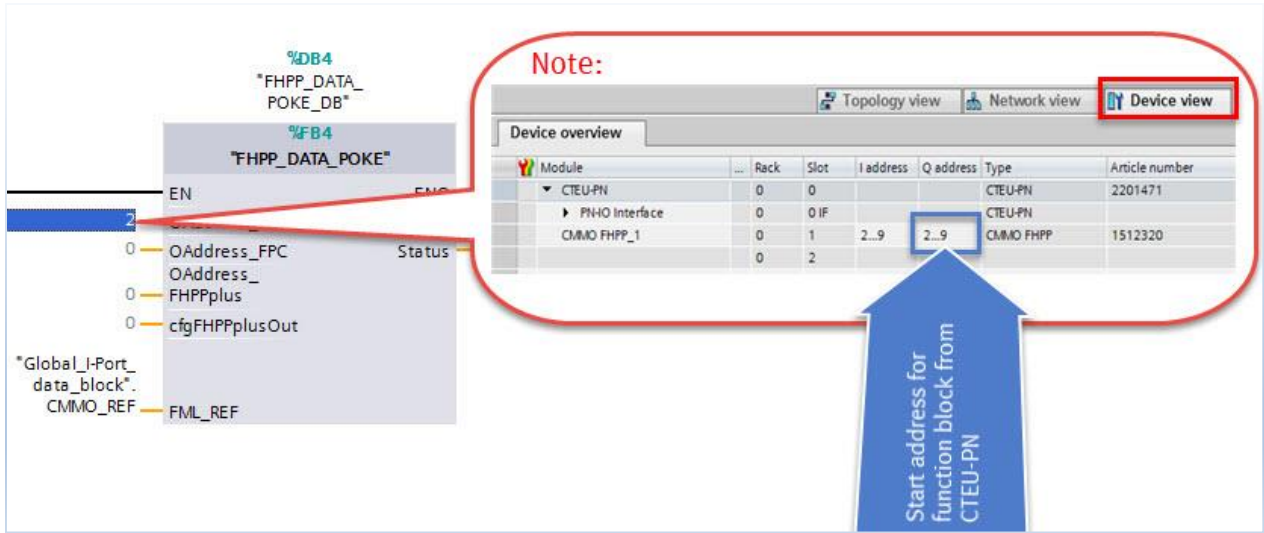
3.5.6 Link the empty FML_REF parameter of the FHPP_CTRL block



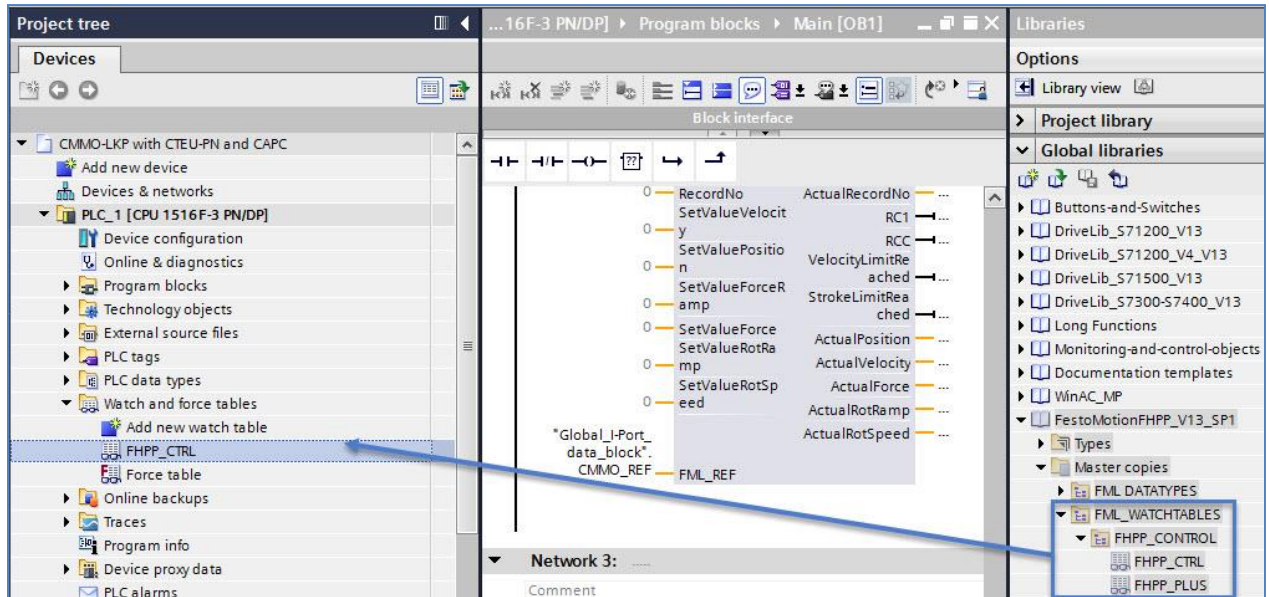
3.5.7 Drag and Drop FHPP Poke block to *Network 3*



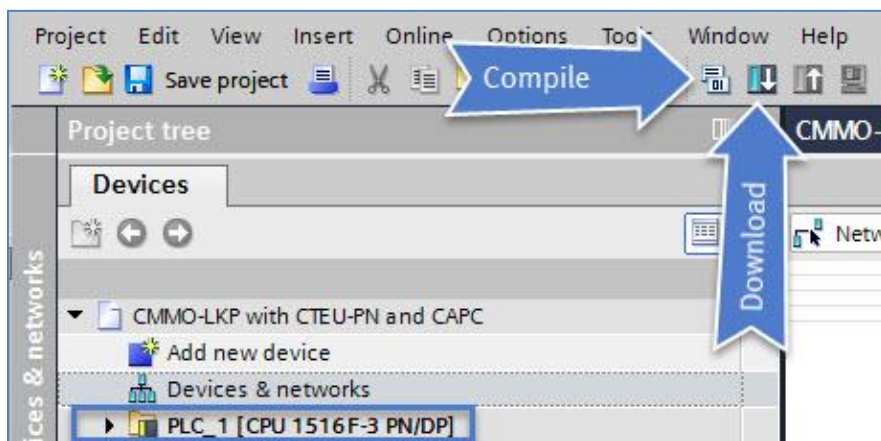
3.5.8 Parameterize the Poke function block



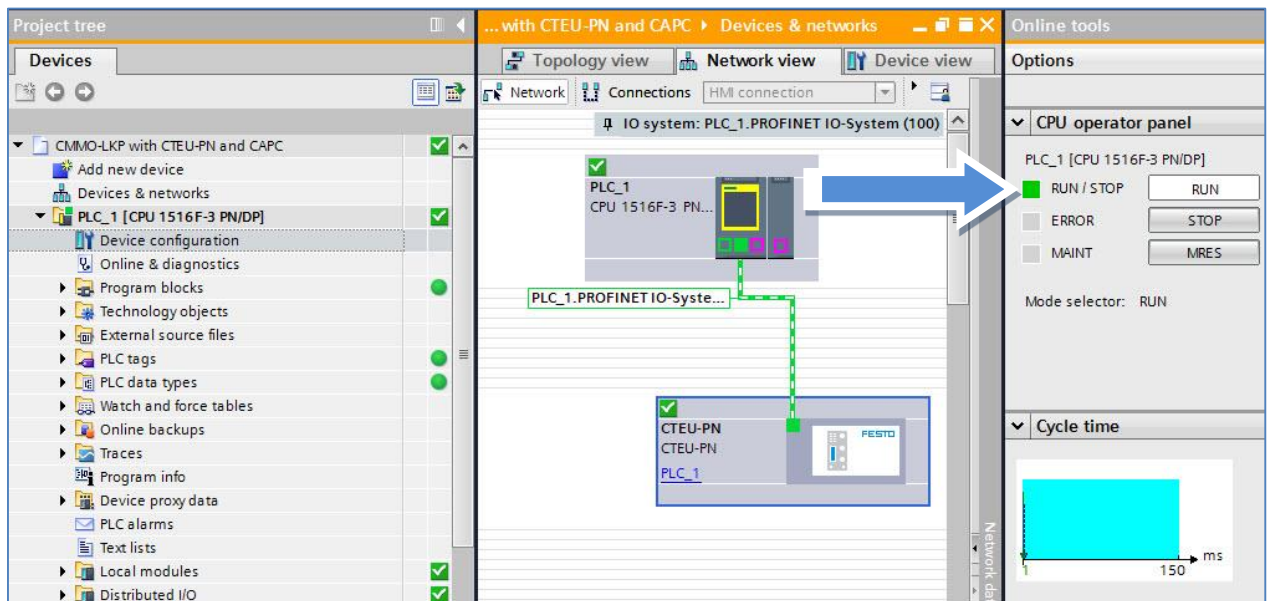
3.5.9 Create a Watch table for testing the CMMO Online



3.5.10 Compile and download the whole project



3.5.11 Go Online and start RUN mode



3.5.12 Test in Online mode the drive via watch table

Project tree: CMMO-LKP with CTEU-PN and CAPC > PLC_1 [CPU 1516F-3 PN/DP] > Watch and force tables > FHPP_CTRL

Name	Address	Display format	Monitor value	Modify value
"FHPP_CTRL_DB".StateOPM	%DB3.DBW34	DEC+/-	1	
"FHPP_CTRL_DB".SupplyVoltPresent	%DB3.DBX32.4	Bool	TRUE	
"FHPP_CTRL_DB".DriveEnabled	%DB3.DBX32.0	Bool	TRUE	
"FHPP_CTRL_DB".Ready	%DB3.DBX32.1	Bool	TRUE	
"FHPP_CTRL_DB".HaltNotActive	%DB3.DBX36.0	Bool	TRUE	
"FHPP_CTRL_DB".Warning	%DB3.DBX32.2	Bool	FALSE	
"FHPP_CTRL_DB".Fault	%DB3.DBX32.3	Bool	FALSE	
"FHPP_CTRL_DB".MC	%DB3.DBX36.2	Bool	FALSE	
"FHPP_CTRL_DB".RC1	%DB3.DBX40.0	Bool	FALSE	
"FHPP_CTRL_DB".RCC	%DB3.DBX40.1	Bool	FALSE	
"FHPP_CTRL_DB".StrokeLimitReached	%DB3.DBX40.3	Bool	FALSE	
"FHPP_CTRL_DB".VelocityLimitReached	%DB3.DBX40.2	Bool	FALSE	
"FHPP_CTRL_DB".AckStart	%DB3.DBX36.1	Bool	TRUE	
"FHPP_CTRL_DB".AckTeach	%DB3.DBX36.3	Bool	FALSE	
"FHPP_CTRL_DB".DriveMoving	%DB3.DBX36.4	Bool	TRUE	
"FHPP_CTRL_DB".DragError	%DB3.DBX36.5	Bool	FALSE	
"FHPP_CTRL_DB".StandStillControl	%DB3.DBX36.6	Bool	FALSE	
"FHPP_CTRL_DB".HomingValid	%DB3.DBX36.7	Bool	FALSE	
"FHPP_CTRL_DB".ActualRecordNo	%DB3.DBW38	DEC+/-	0	
"FHPP_CTRL_DB".ActualRotRamp	%DB3.DBW52	DEC+/-	0	
"FHPP_CTRL_DB".ActualRotSpeed	%DB3.DBW56	DEC+/-	0	
"FHPP_CTRL_DB".ActualForce	%DB3.DBW50	DEC+/-	0	
"FHPP_CTRL_DB".ActualVelocity	%DB3.DBW46	DEC+/-	67	
"FHPP_CTRL_DB".ActualPosition	%DB3.DBW42	DEC+/-	81800	
"FHPP_CTRL_DB".EnableDrive	%DB3.DBX0.0	Bool	TRUE	TRUE
"FHPP_CTRL_DB".Stop	%DB3.DBX0.1	Bool	TRUE	TRUE
"FHPP_CTRL_DB".Halt	%DB3.DBX0.2	Bool	TRUE	TRUE
"FHPP_CTRL_DB".Brake	%DB3.DBX0.3	Bool	FALSE	
"FHPP_CTRL_DB".ResetFault	%DB3.DBX0.4	Bool	FALSE	FALSE
"FHPP_CTRL_DB".StartHoming	%DB3.DBX4.1	Bool	FALSE	FALSE
"FHPP_CTRL_DB".StartTask	%DB3.DBX4.0	Bool	FALSE	FALSE
"FHPP_CTRL_DB".JogPos	%DB3.DBX4.2	Bool	TRUE	TRUE