

### **Commissioning of CMMT-AS in Festo Automation Suite with CPX-E-CEC-M1-PN**

This application notes describes step by step how you  
configure a CMMT-AS-EC with CPX-E-CEC-M1-PN in

- Automation Suite

And how you can use the PTP libraries.

CMMT-AS

Title..... Commissioning CMMT\_AS in Festo Automation Suite with CPX-E-CEC-M1-PN  
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# 1 Components/Software/ IP address

Type/Name	Version Software/Firm-ware	IP address	Subnet mask
CMMT-AS	FW 014.0.5.1	192.168.0.20	255.255.255.0
CPX-E-CEC-M1-PN	FW 1.0.10	192.168.0.10	255.255.255.0
Laptop	--	192.168.0.200	255.255.255.0
Festo Automation Suite	V 1.0.3.6	--	--
CMMT-AS Plug-in	V 1.0.2.5	--	--
CPX Plug-in	V 1.0.0.43	--	--

Table 1.1: 1 Components/Software used



## Information

This AppNote describes the procedure with the CMMT-AS motor controller. The CMMT-AS servo drive controller and CMMT-ST servo drive controller for extra-low voltage are based on the same software platform. Therefore, the described settings can also be used as a reference for its parameterization. It is hereby expressly pointed out, that this has not been explicitly tested and therefore the function cannot be guaranteed!

## 1.1 Recommended manuals / XML / Plug-in / function blocks

### A) CMMT-AS Manual



#### Manual CMMT-AS-SW-EN

Servoantriebsregler - CiA 402 - Function - EtherCAT - Software

#### Associated products

- servo drive CMMT-AS-C2-3A-EC-S1 (5340819)
- servo drive CMMT-AS-C4-3A-EC-S1 (5340820)



Manual

→ File and language versions

★★★★★

### B) Festo Automation Plug-in

#### Festo Automation Suite

Parameterisation, programming and maintenance of electronic devices by Festo

1.0.3.6

23/07/2018

→ Commissioning

→ File and language versions

★★★★★ (19)

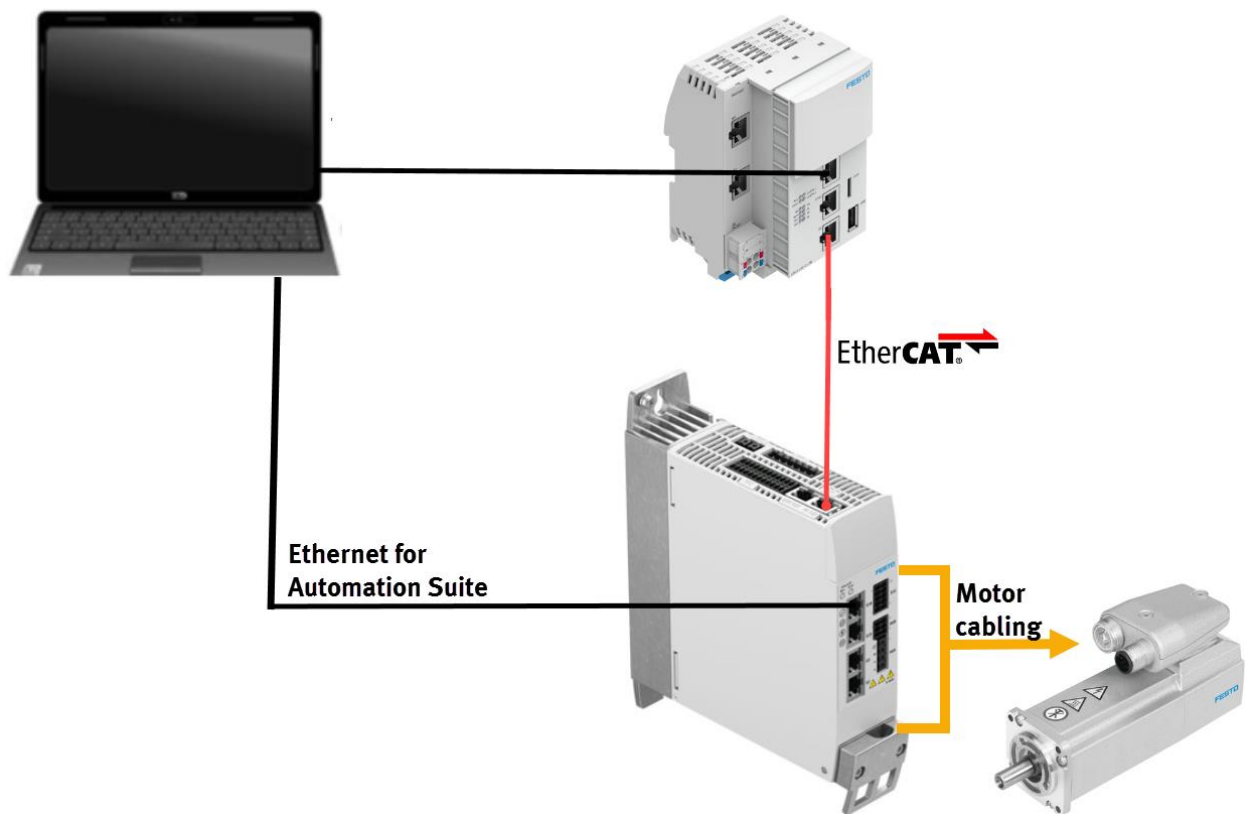
#### New Features:

- English online help

Source:

[https://www.festo.com/net/en-gb\\_gb/SupportPortal/default.aspx?q=5340819&tab=4&s=t#result](https://www.festo.com/net/en-gb_gb/SupportPortal/default.aspx?q=5340819&tab=4&s=t#result)

## 1.2 Network topology



### Hint:

Festo offers M12-RJ45, RJ45-RJ45 and M12-M12 connecting cables for the Ethernet communication:

Type code	Part number	Description
NEBC-D12G4-ES-0.5-S-D12G4-ET	8040446	M12-M12 -> 0,5m
NEBC-D12G4-ES-1-S-D12G4-ET	8040447	M12-M12 -> 1m
NEBC-D12G4-ES-3-S-D12G4-ET	8040448	M12-M12 -> 3m
NEBC-D12G4-ES-5-S-D12G4-ET	8040449	M12-M12 -> 5m
NEBC-D12G4-ES-10-S-D12G4-ET	8045450	M12-M12 -> 10m
NEBC-D12G4-ES-1-S-R3G4-ET	8045451	M12-RJ45 -> 1m
NEBC-D12G4-ES-3-S-R3G4-ET	8045452	M12-RJ45 -> 3m
NEBC-D12G4-ES-5-S-R3G4-ET	8045453	M12-RJ45 -> 5m
NEBC-D12G4-ES-10-S-R3G4-ET	8040454	M12-RJ45 -> 10m
NEBC-R3G4-ES-1-S-R3G4-ET	8040455	RJ45-RJ45 -> 1m

Table 1.2: Connecting cables

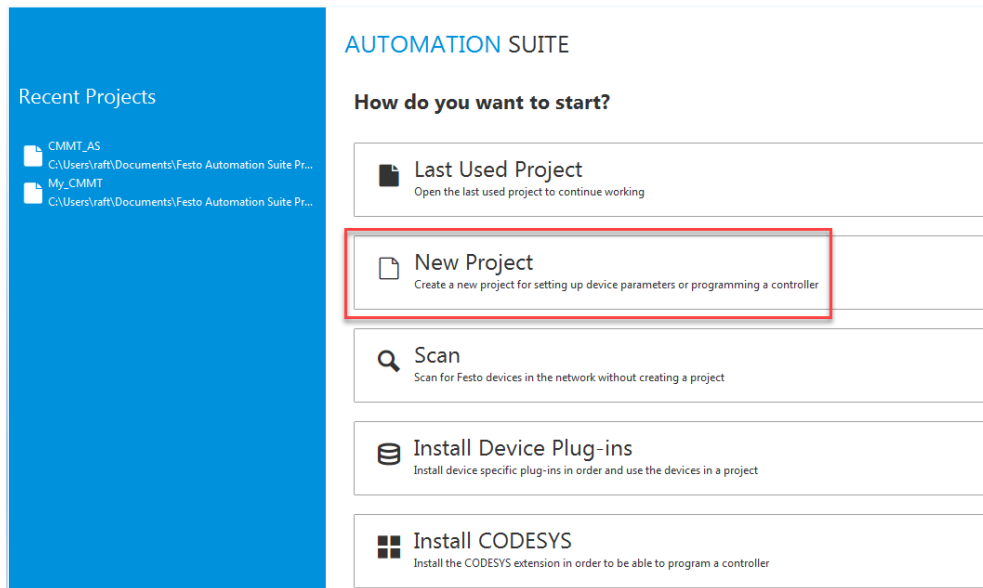
More information:

[https://www.festo.com/net/en-gb\\_gb/SupportPortal/default.aspx?q=8040446&tab=3](https://www.festo.com/net/en-gb_gb/SupportPortal/default.aspx?q=8040446&tab=3)

## 2 The first steps in Automation Suite

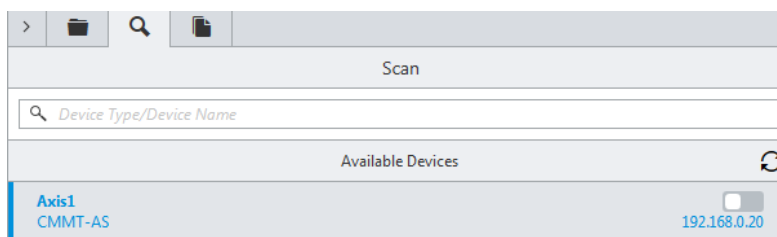
### 2.1 Creating a new project

Step 1: After starting Automation Suite you have the possibility to open your recent projects or to create a new project:



### 2.2 Step by step commissioning of CMMT-AS

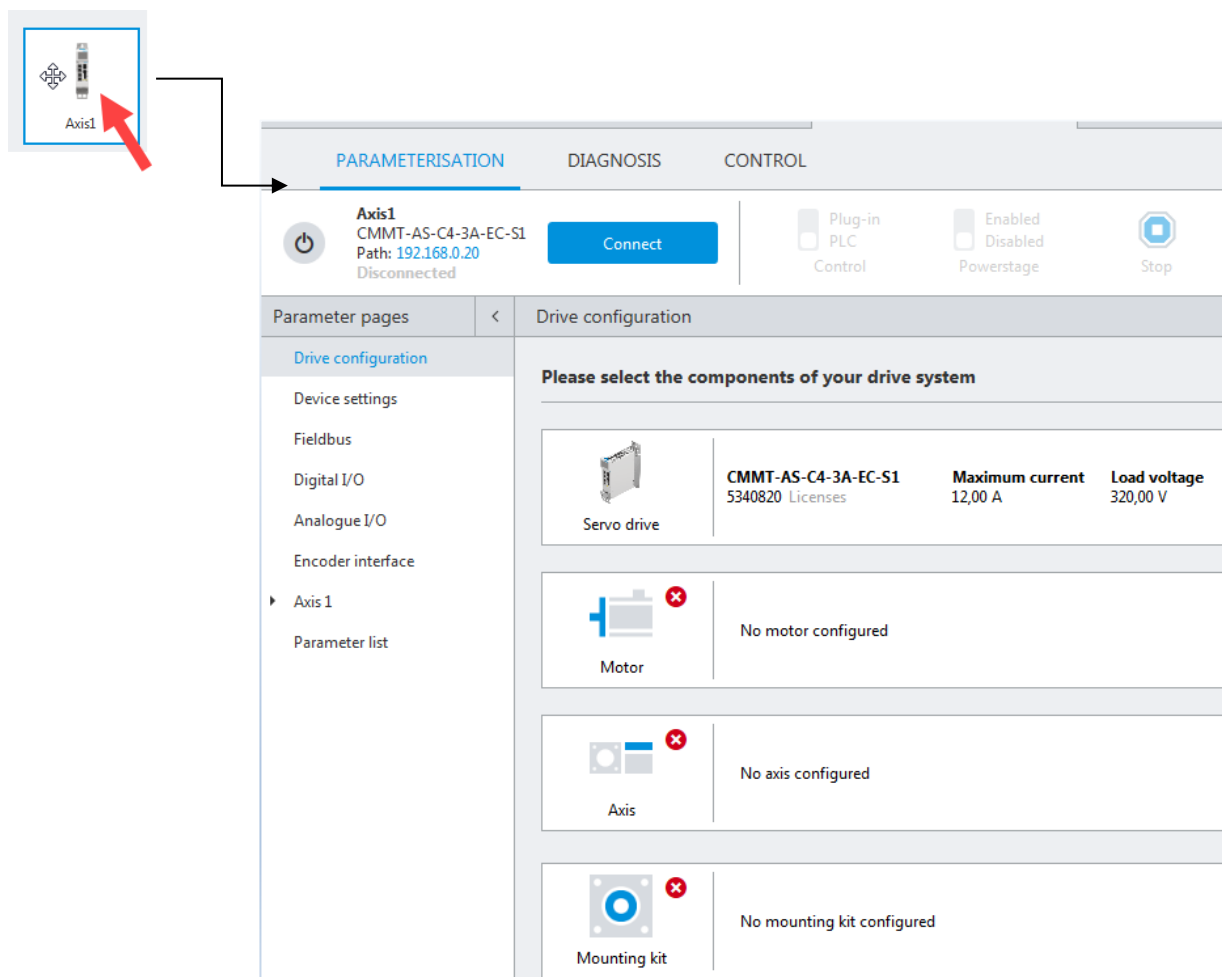
Step 2: Searching for the connected CMMT-AS via the **smaller** loupe, because then you can drag and drop the connected devices to your project



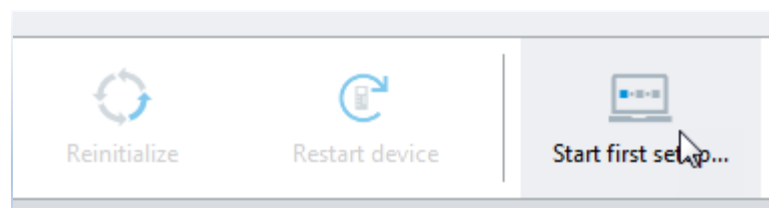
Step 3: Drag and Drop the CMMT-AS to your new project



Step 4: Open the CMMT-AS configuration view via double click on Axis1



Step 5: Use the Wizard for an easy and fast configuration





Step 6: Start the configuration step by step

- A) Choose the Servo drive (Optional step, if you didn't drag and drop the Online available device)

Drive configurati...

Please select the components of your drive system

Select servo drive

Please enter a search phrase and/or select a device from the list below.

Order code  
Part number

5340820

Search results

CMMT-AS-C4-3A-EC-S1 5340820

Have a look on the label

- B) Choose the connected motor

Select Motor

Please enter a search phrase and/or select a device from the list below.

Order code  
Part number

EMME-AS-40-S-LV-AS

Search results

Selected component

EMME-AS-40-S-LV-AS 2082428

EMME-AS-40-S-LV-ASB 2082430

- C) Define the axis (-> In this application we are working with an unlimited user defined rotative axis)

Select axis

Please enter a search phrase and/or select a device from the list below.

Order code/part number

Search results

User defined linear axis

User defined rotative axis

User defined rotative axis

Search results

Selected component

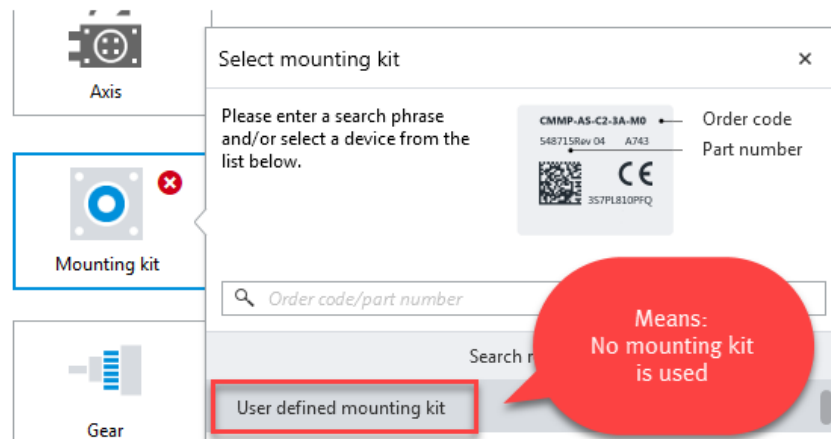
Current user unit  
Rev [rev, rpm, ...] (3)

Motion  
Rotative

Unlimited axis ☒ Active

Design axis  
Single axis (0)

D) Define the mounting kit (-> **In this application we are using no mounting kit**)



Step 7: After the basic configuration is finished the options for Application data, Hardware switches, Homing method and Software limits are available

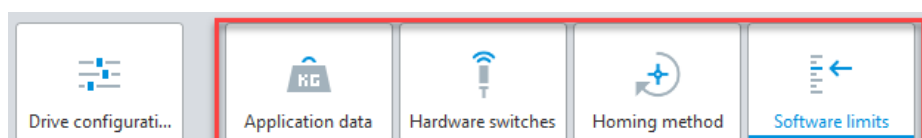
**Please select the components of your drive system**

	<b>CMMT-AS-C4-3A-EC-S1</b> 5340820 Licenses	<b>Maximum current</b> 12,00 A	<b>Load voltage</b> 320,00 V
	<b>EMME-AS-40-S-LV-AS</b> 2082428	<b>Type</b> EC motor (2)	<b>Holding brake</b> No
		<b>Encoder protocol</b> HiPerface (0)	<b>Encoder type</b> Single turn (1)
		<b>Voltage</b> 360,00 V	
	<b>User defined rotative axis</b>	<b>Position Range</b> Unlimited	
	<b>User defined mounting kit</b>	<b>Type</b> Axial kit	
	No gear configured		

You have access to this parameters via the “Next” button which appears on the lower right corner



Or per direct click in the upper menu





**Note:**

- In this application we have used following settings.

**Application data**

Axis mass moment of inertia 0,00 kgcm<sup>2</sup>

Application moment of inertia 0,00 kgcm<sup>2</sup>

Total mass moment of inertia 0,00 kgcm<sup>2</sup>

**Rotation polarity**

Please select the mounting position of the motor (viewed from top):

☐ Invert rotation polarity

**Hardware switches**

Reference switch configuration Deactivated (0)

Limit Switches Configuration Not used (1)

**Homing method**

Method Method 37: Current position (37)

Nominal current limit percentage 0,20

Move to axis zero point after homing ☒ Active

**Software limits**

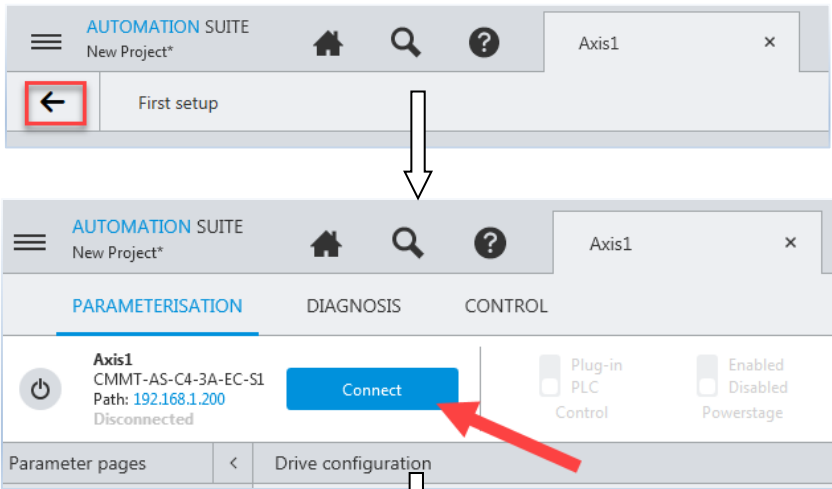
Axis zero point offset 0,00 r

Software limit positions active ☐ Active

Negative software limit position -0,03 r

Positive software limit position 0,97 r

Step 8: Close the Wizard and download everything to the motor controller



The first screenshot shows the 'Automation Suite' window with the 'First setup' button highlighted by a red box. A white arrow points from this button to the 'Connect' button in the second screenshot. The second screenshot shows the 'Automation Suite' window with the 'Connect' button highlighted by a red arrow. A white arrow points from this button to the 'Parameter synchronisation' dialog box.

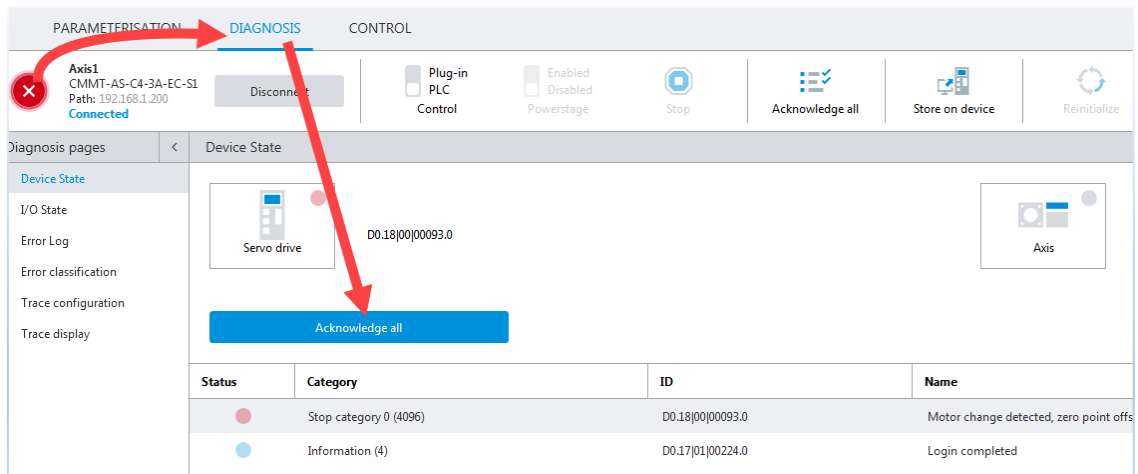
**Parameter synchronisation**

The following parameters mismatch. Please choose whether you want to transfer the parameters from the project to the device or vice versa.

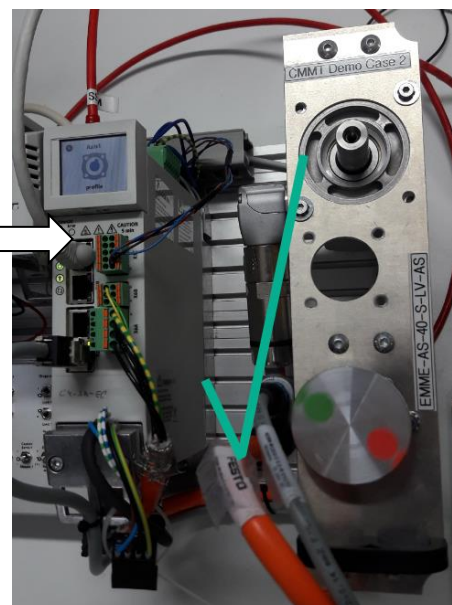
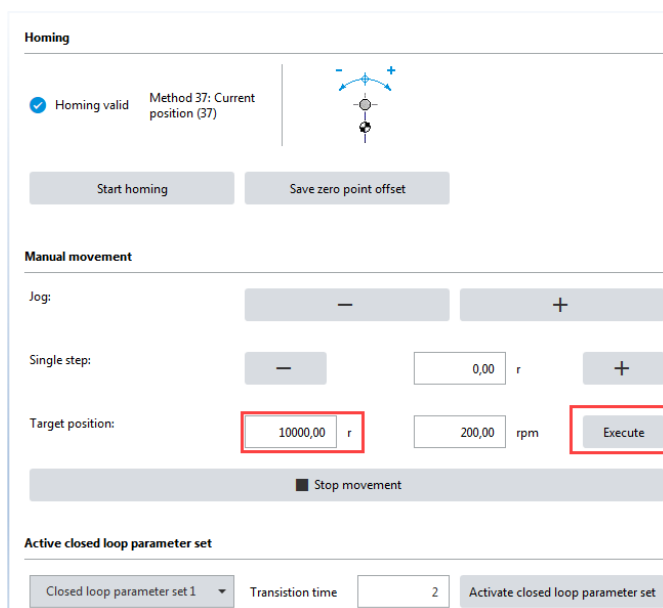
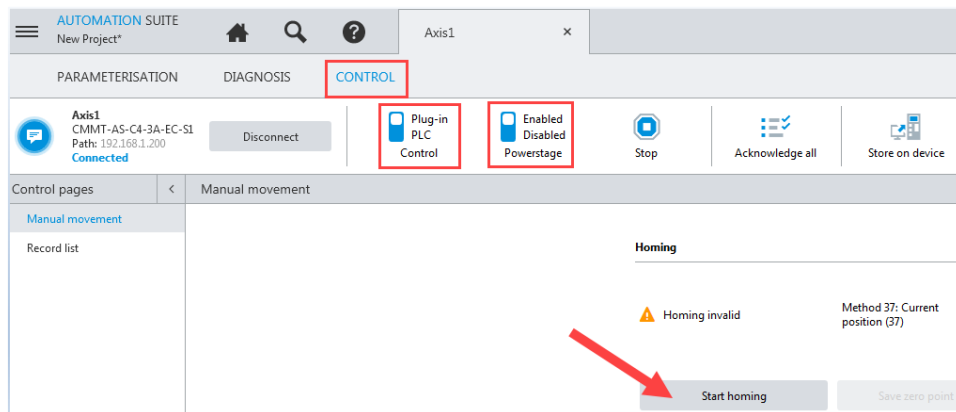
ID	Name	Value in project	Unit	Value on device	Unit
P0.494.0.0	Upper mains voltage val	530,00		265,00	
P0.3223.0.0	Zero point offset from u	0,00		-0,031795769	
P0.3226.0.0	Referencing in user cont	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
P0.3239.0.0	Serial number motor ref			SC500410F	
P0.4811.0.0	Warning thresholds DC	790,00		390,00	
P0.4812.0.0	Switch-on threshold bra	760,00		370,00	
P0.4813.0.0	Upper limit value DC lin	800,00		400,00	
P0.9311.0.0	Upper limit value servo	80,00		85,00	
P0.9314.0.0	Upper limit value warnir	80,00		85,00	
P0.9315.0.0	Upper limit value power	90,00		95,00	
P1.2227.0.0	Total inertia	0,000003		0,00	
P1.2227.0.1	Total inertia	0,000003		0,00	
P1.2227.0.2	Total inertia	0,000003		0,00	
P1.7111.0.0	Motor inertia (user-defir	0,000003		0,000003	
P1.7144.0.0	Time constant I <sup>2</sup> t (user-i	10,00		10000,00	
P1.8416.0.0	Axis zero point offset	0,00		0,00	

At the bottom of the dialog box, there are three buttons: 'Write to device', 'Read from device', and 'Stay offline'. A red arrow points to the 'Write to device' button.

Step 9: If the CMMT-AS was in use already then, a change can occur some diagnosis messages.  
You can delete them:

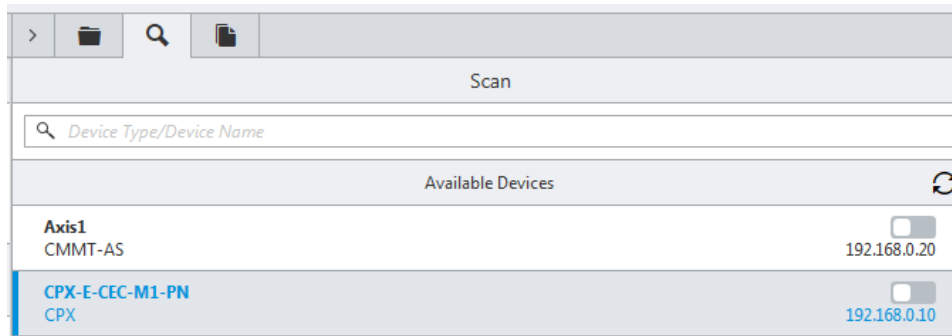


After that you can do for testing purpose a Homing and some movements

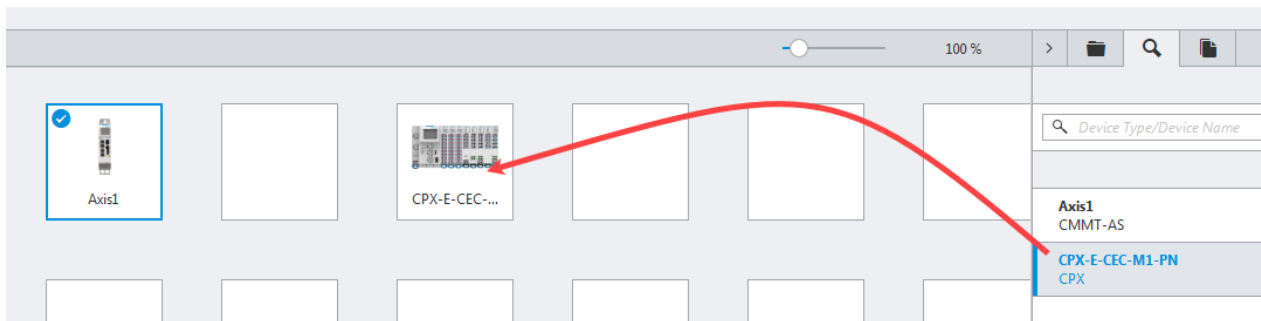


## 2.3 Step by Step commissioning of CPX-E-CEC-M1-PN

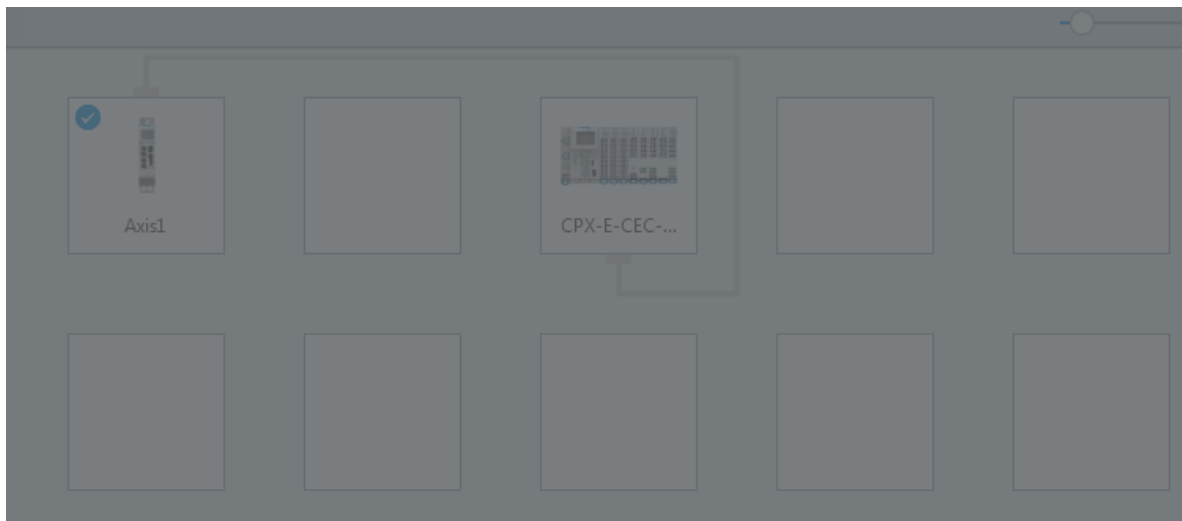
Step1: Searching for the connected CPX-E-CEC-M1-PN via the **smaller** loupe, because then you can drag and drop the connected the devices to your project



Step2: Drag and drop the CPX-E-CEC-M1-PN to your project



Step3: To establish a EtherCAT communication path you must draw a line between master and slave

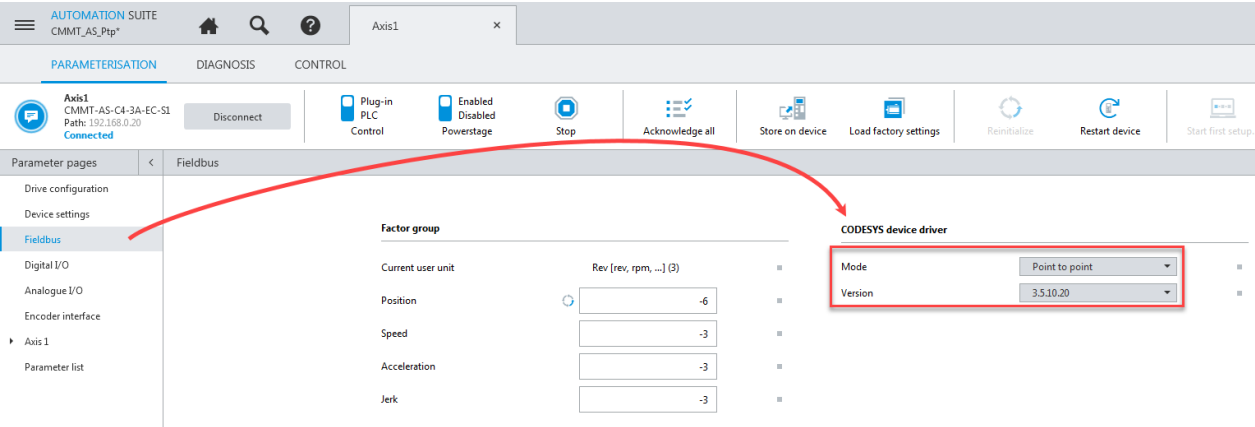


● Initializing master/slave connection...

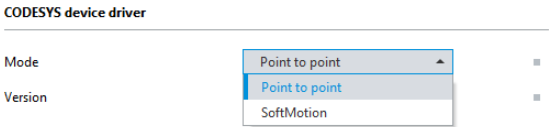
The result could look like:



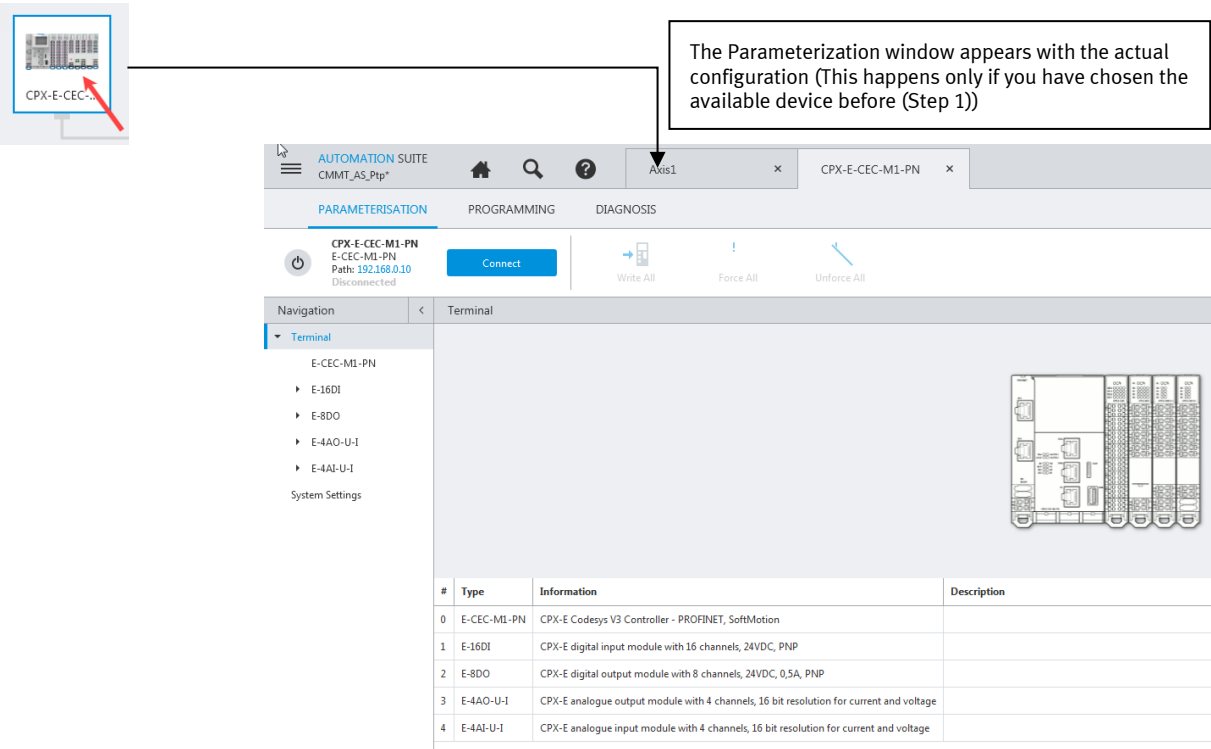
**Important:**  
After you have established an EtherCAT communication following new option appears at CMMT-AS



You can change the mode depending on your needs (In this document we are using just PtP):



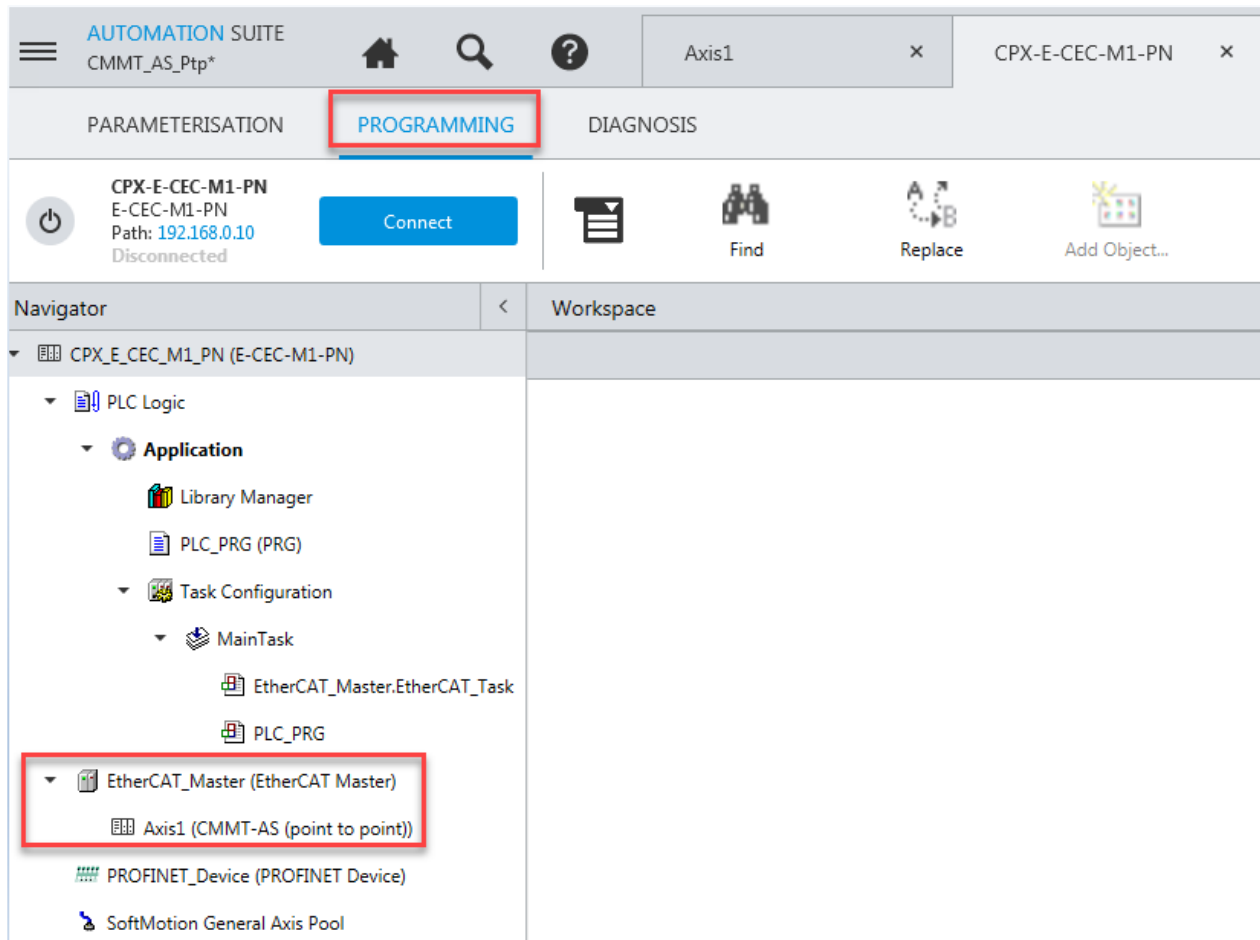
Step4: Open the CPX-E-CEC-M1-PN Codesys view via double click



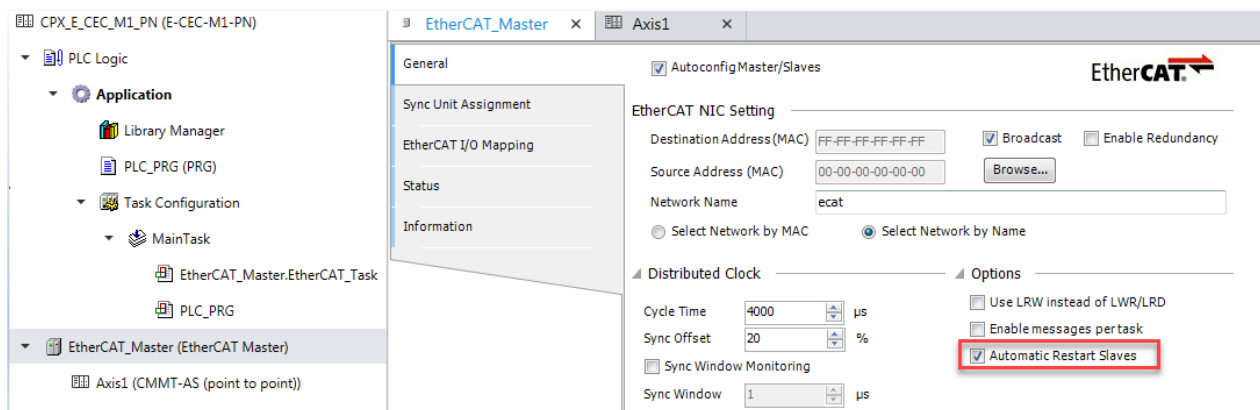
## The first steps in Automation Suite

### Step5: Open the Programming tap

If you have established the EtherCAT communication, then the system recognizes the CMMT-AS automatically



### Step6: For testing purpose and easier handling in EtherCAT activate following option

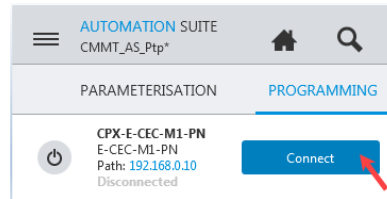


Automatic Restart Slaves means that in the event of communication breakdown the master tries to restart the slaves cyclically till everything is running again.

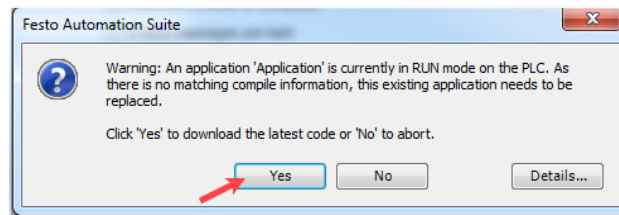


Step7: Download the project to the PLC and check if the EtherCAT communication is running

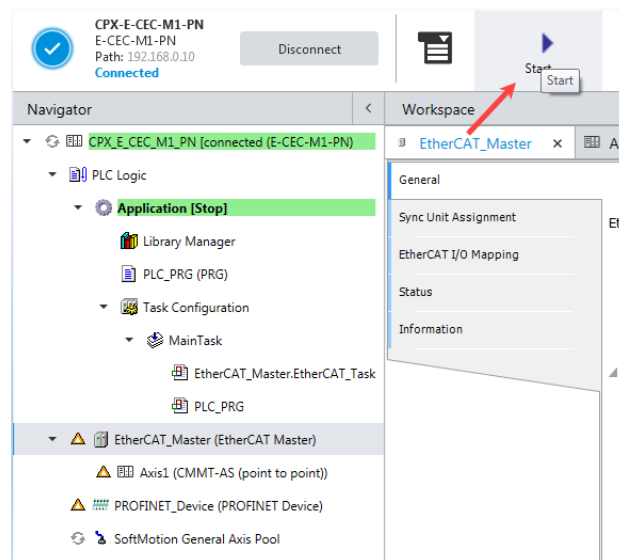
A) Connect to device to start download automatically



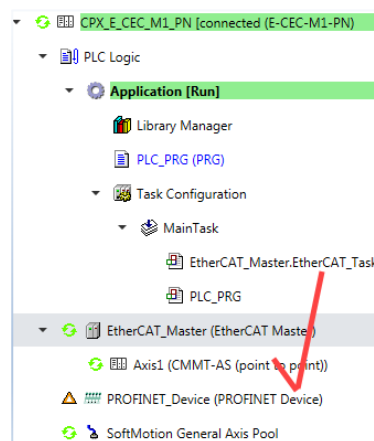
B) Accept the Warning



C) Switch PLC to Run Mode

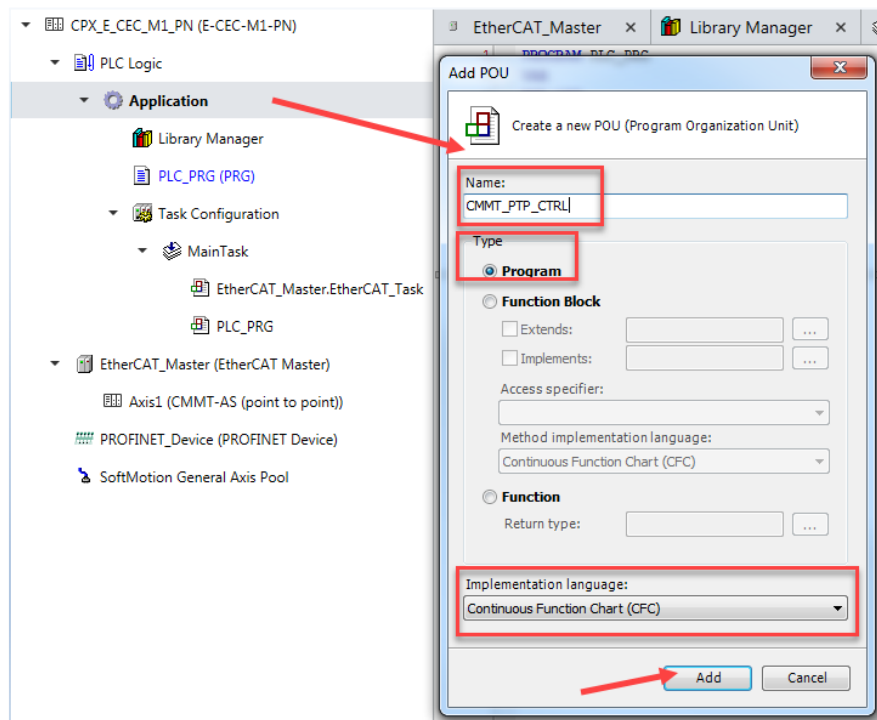


D) Check result (Green = EtherCAT is running)

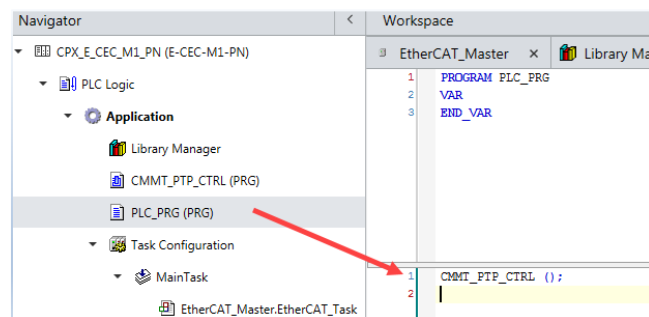


## 2.4 Using the PtP function blocks

Step1: Add e.g. a CFC program



2. Call the CFC (PRG) in the PLC\_PRG cyclically

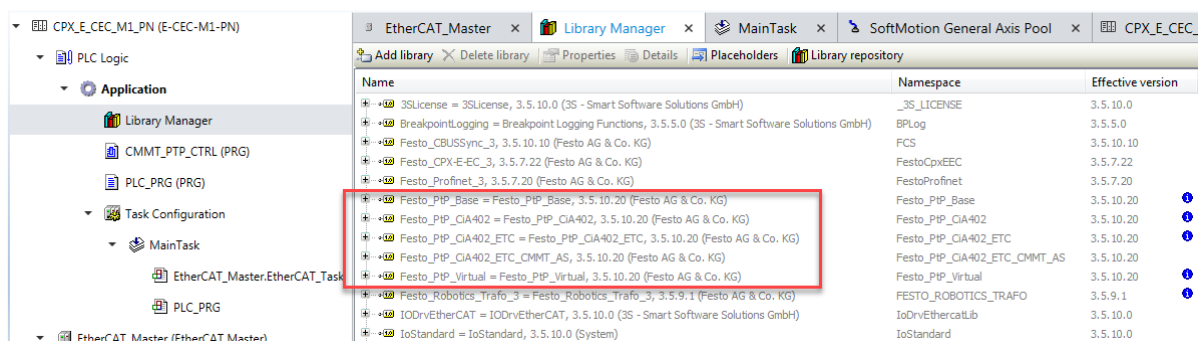


3. Integrate the Festo PtP function blocks in your CFC (PRG)

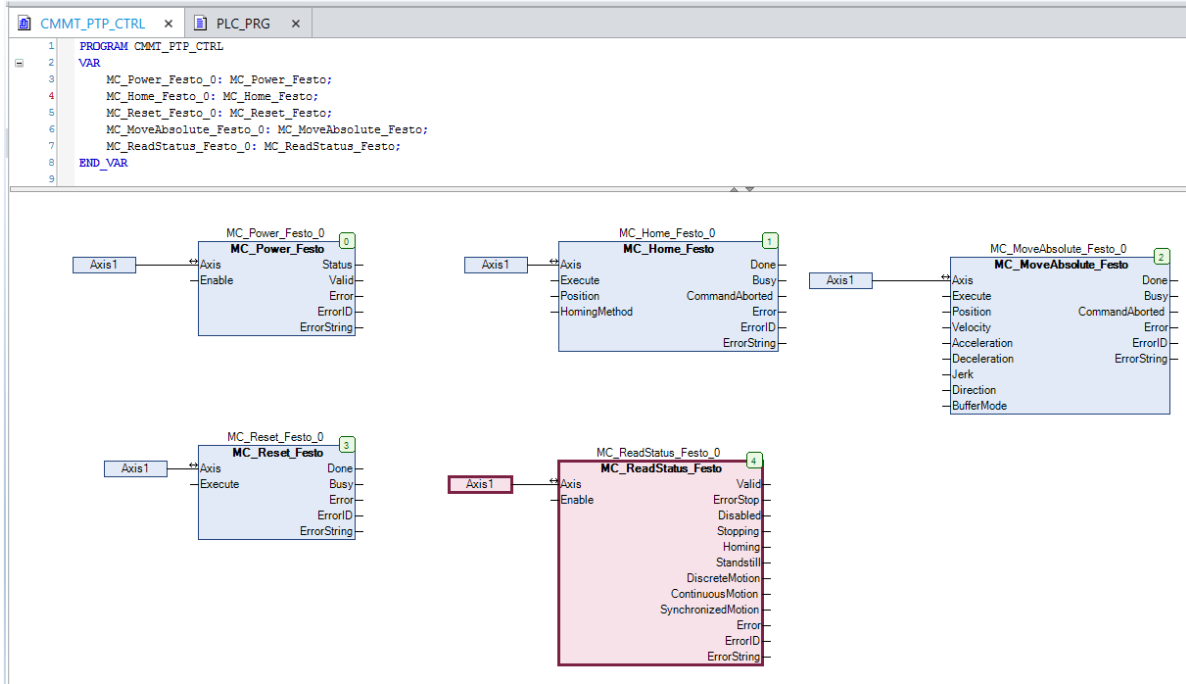


### Note:

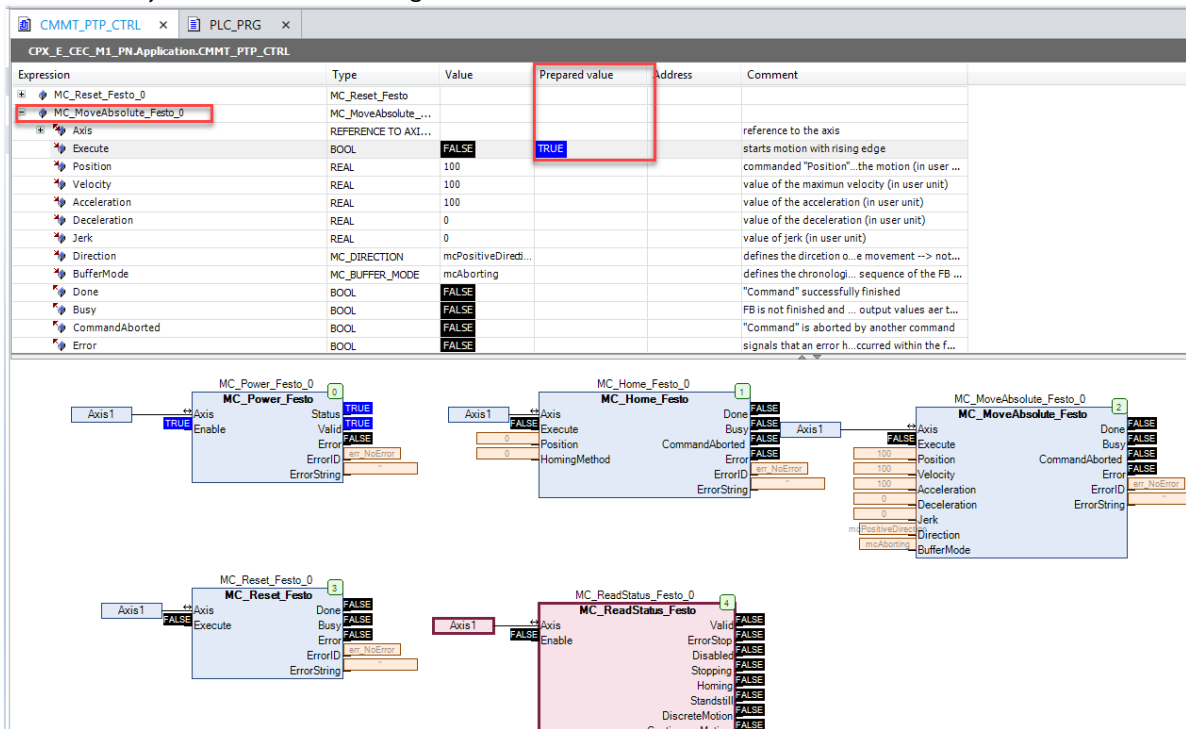
- You find all available FB's in the Library Manager. They are included in the CPX-E-CEC-M1-PN package.



A simple testing program (without variables) could look like this:



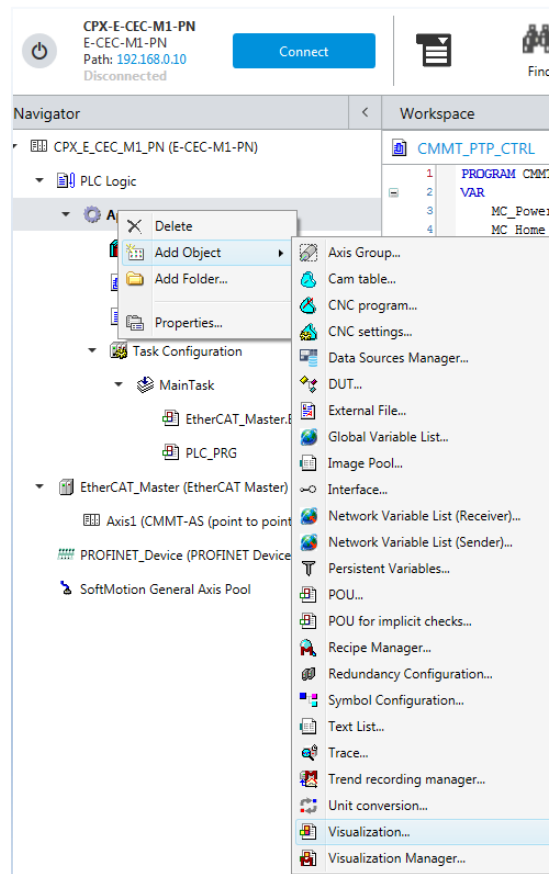
After download you could use for testing the internal FB variables in Online Mode:



### 2.4.1 Creating a visualisation

To make the testing easier you can use the available FB visualisation elements.

Step1: Add visualization

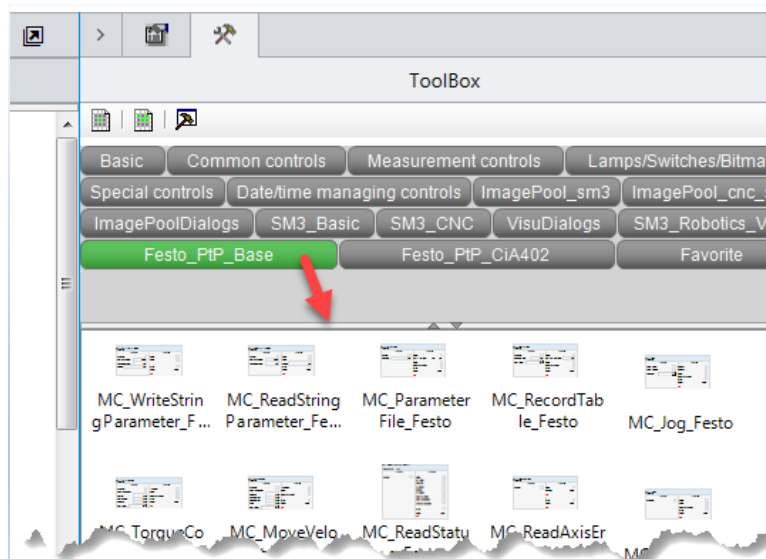


Step2: Drag and drop the Visualisation element which you want to use from the PtP library **and** link the Visu elements to the corresponding function blocks

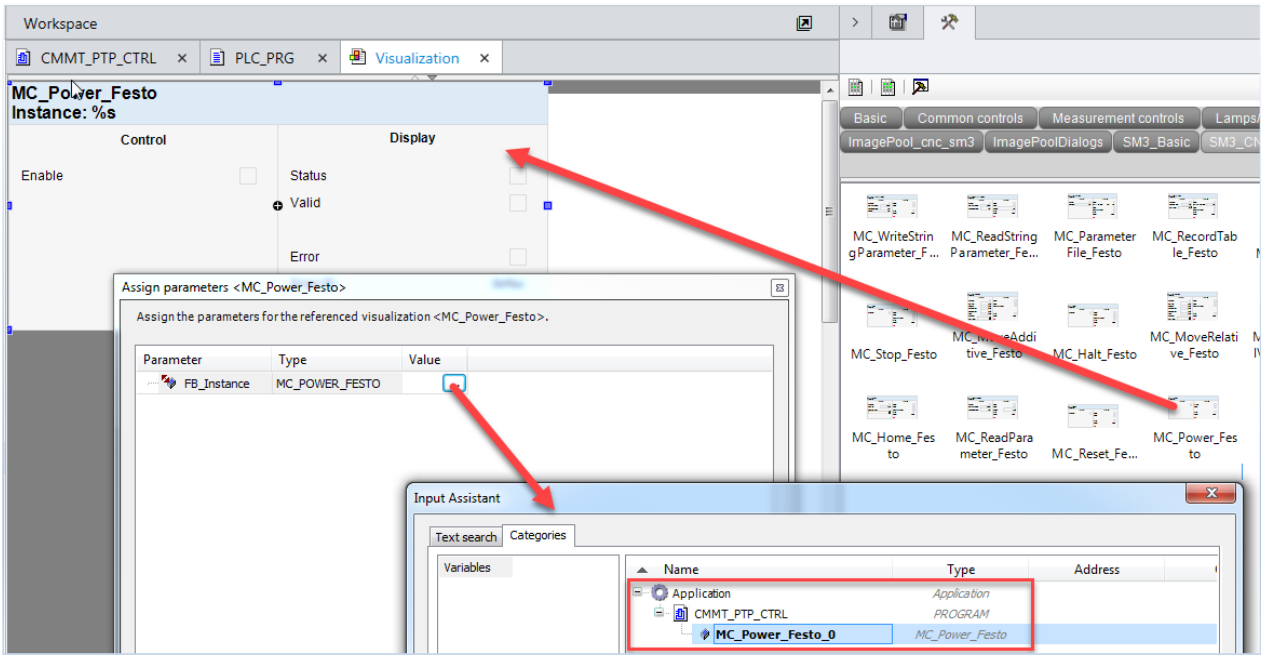


**Note:**

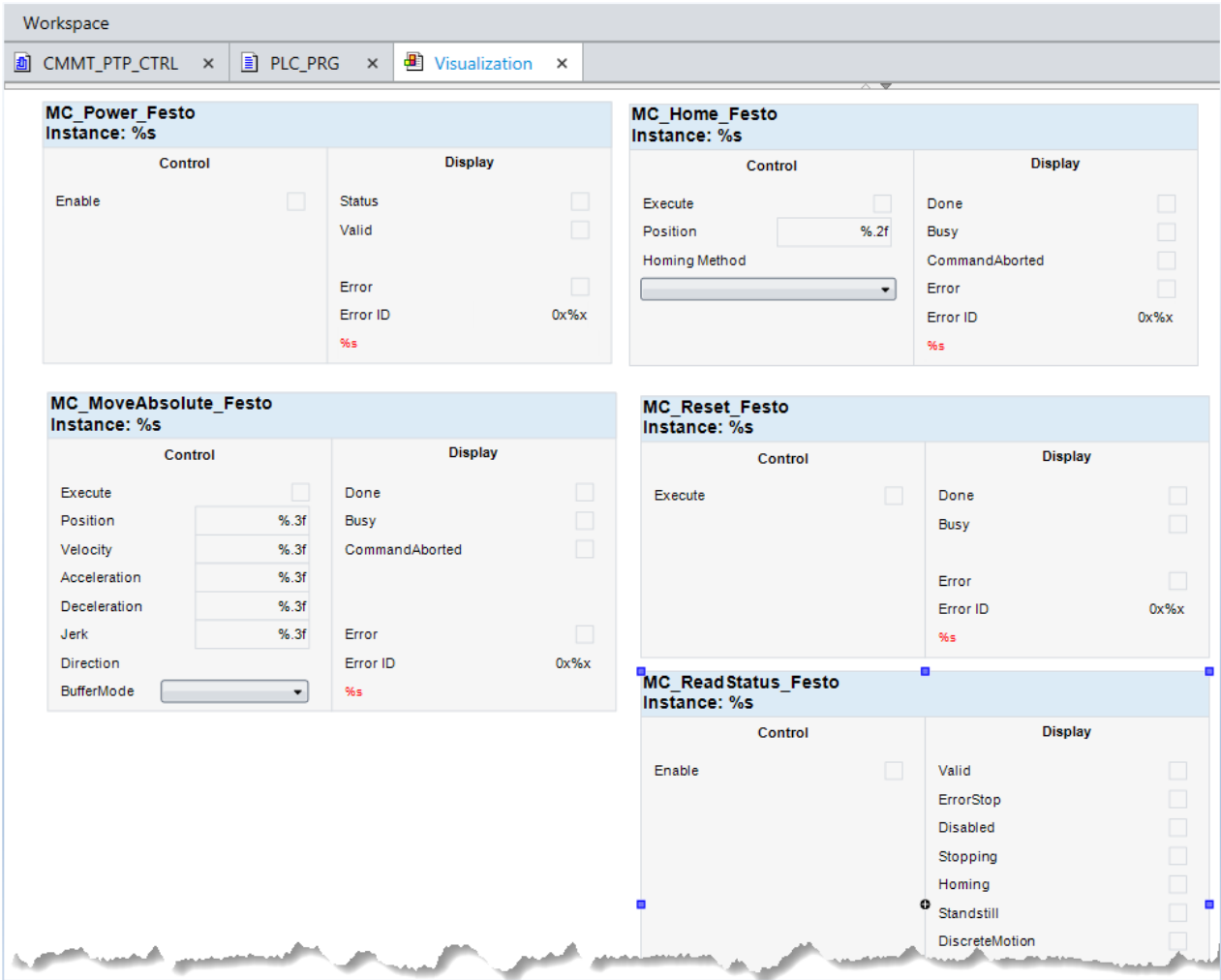
- In the Toolbox you find all Visu PtP elements.



The linking process is looking like this:



An easy visualization could look like this:



### Step 3: Test your visualization in Online Mode:

The screenshot displays the Festo Automation Suite interface in Online Mode. The top bar shows the connection status as 'Connected' for 'CPX-E-CEC-M1-PN' at 'Path: 192.168.0.10'. The main workspace is divided into a Navigator on the left and a Workspace on the right.

**Navigator:**

- PLC Logic
  - Application [Run] (highlighted)
  - VisualizationStyle
- Library Manager
  - CMMT\_PTP\_CTRL (PRG)
  - PLC\_PRG (PRG)
  - Task Configuration
    - MainTask
      - EtherCAT\_Master.EtherCAT\_Task
      - PLC\_PRG
  - Visualization Manager
  - Visualization (highlighted)
- EtherCAT\_Master (EtherCAT Master)
  - Axis1 (CMMT-AS (point to point))
  - PROFINET\_Device (PROFINET Device)
  - SoftMotion General Axis Pool

**Workspace:**

The workspace contains several motion control blocks, each with a 'Control' and 'Display' section. A large green arrow points to the 'MC\_MoveAbsolute\_Festo' block.

- MC\_Power\_Festo** (Instance: CMMT\_PTP\_CTRL.MC\_Power\_Festo\_0)
  - Control: Enable (checked)
  - Display: Status (checked), Valid (checked), Error (unchecked), Error ID (0x0)
- MC\_Home\_Festo** (Instance: CMMT\_PTP\_CTRL.MC\_Home\_Festo\_0)
  - Control: Execute (unchecked), Position (0.00), Homing Method (As parametrized in AutomationSuite)
  - Display: Done (unchecked), Busy (unchecked), CommandAborted (unchecked), Error (unchecked), Error ID (0x0)
- MC\_MoveAbsolute\_Festo** (Instance: CMMT\_PTP\_CTRL.MC\_MoveAbsolute\_Festo\_0)
  - Control: Execute (checked), Position (200.000), Velocity (800.000), Acceleration (40.000), Deceleration (0.000), Jerk (0.000), Direction (mcAborting), BufferMode (mcAborting)
  - Display: Done (unchecked), Busy (checked), CommandAborted (unchecked), Error (unchecked), Error ID (0x0)
- MC\_Reset\_Festo** (Instance: CMMT\_PTP\_CTRL.MC\_Reset\_Festo\_0)
  - Control: Execute (unchecked)
  - Display: Done (unchecked), Busy (unchecked), Error (unchecked), Error ID (0x0)
- MC\_ReadStatus\_Festo** (Instance: CMMT\_PTP\_CTRL.MC\_ReadStatus\_Festo\_0)
  - Control: Enable (checked)
  - Display: Valid (checked), ErrorStop (unchecked), Disabled (unchecked), Stopping (unchecked), Homing (unchecked), Standstill (unchecked)