



Commissioning of CPX-FB40 with Automation Studio

The application node contains a step by step explanation how to configure a CPX-FB40 Ethernet POWERLINK valve terminal via B&R Automation Studio Software.

CPX-FB40

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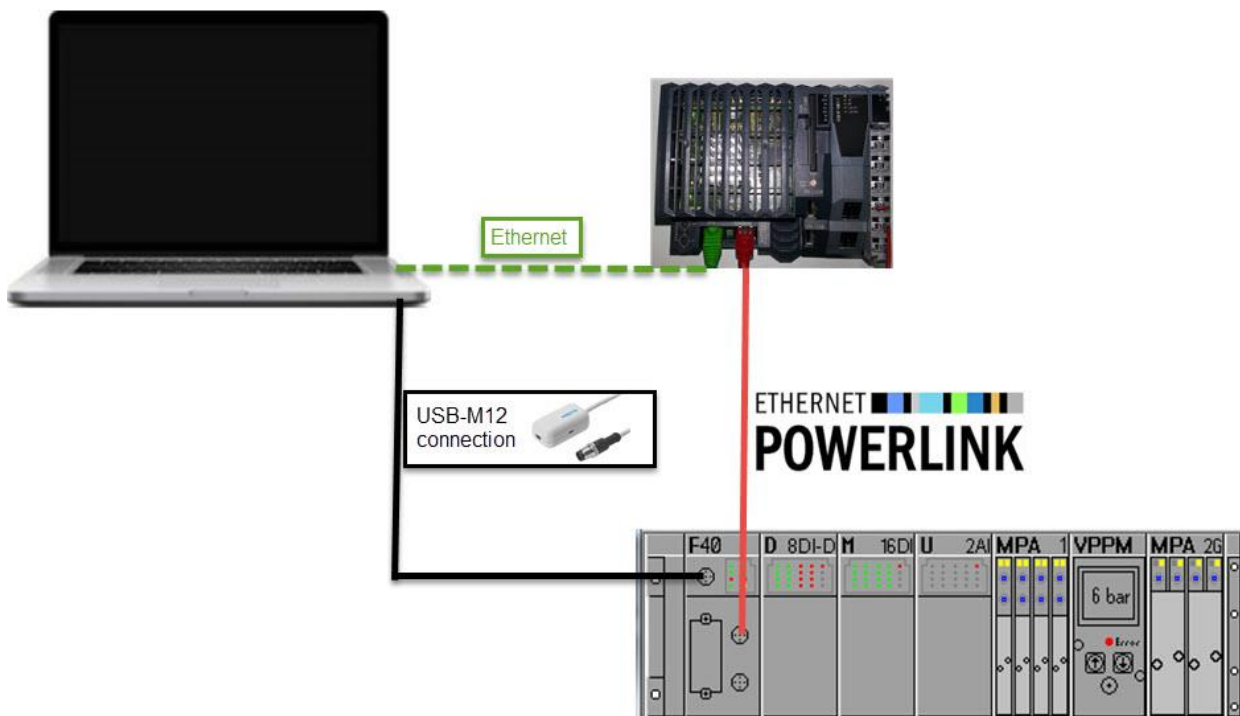
1 Components/Software/ IP address used

Type/Name	Version Software/Firmware	Powerlink slave address
CPX-FB40	REV 5	1
FMT Software	4.21.203	--
X20 CP 1585	D4.24	--
Automation Studio	V4.2.4.149	--

Table 1.1: 1 Components/Software used

1.1 Topology

The CPX-FB40 is connected via M12-RJ45 Ethernet cable to the B&R PLC IF3 POWERLINK port:



Note:

As soon as the POWERLINK mode of CPX-FB40 is activated it is not possible to get access via IP address. To have access permanently to the CPX-FB40 it is recommended to use our FMT software and our NEFC-M12G5-0.3-U1G5 (pn: 547432) USB adapter. The FMT software you find in the Support Portal:

https://www.festo.com/net/en-gb_gb/SupportPortal/default.aspx?q=FMT&tab=4&type=76#result

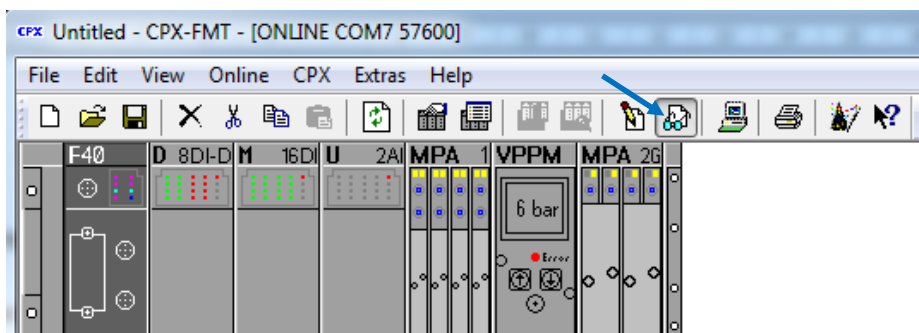
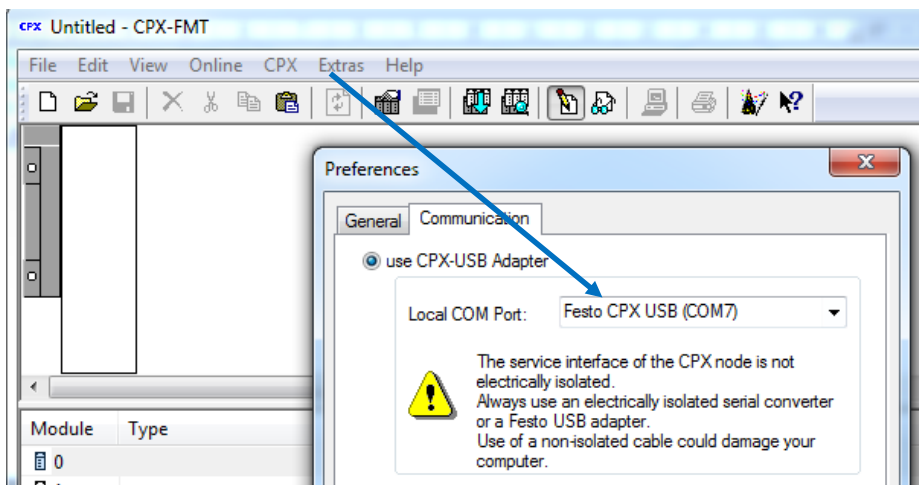
2 Create a Powerlink .XDC file

2.1 Background information

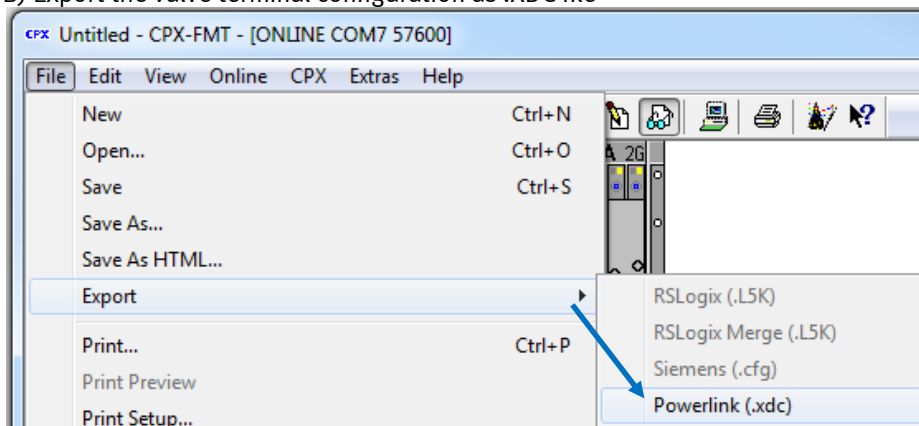
The CPX-FB40 supports the **DS401** Device-Profile for “Generic I/O Modules” (XDC) which allows us to see the valve terminal as modular device. It is recommended to use this device profile instead of the generic DS301 profile, because the parameterization, handling and commissioning is much easier.

2.2 Create a .XDC file with FMT

A) Go online with FMT via the USB adapter (--> As reference See chapter 1)



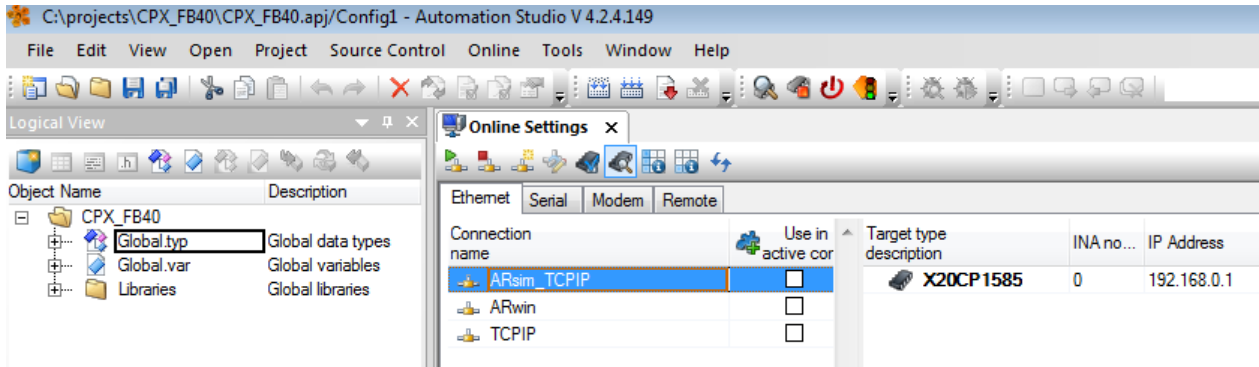
B) Export the valve terminal configuration as .XDC file



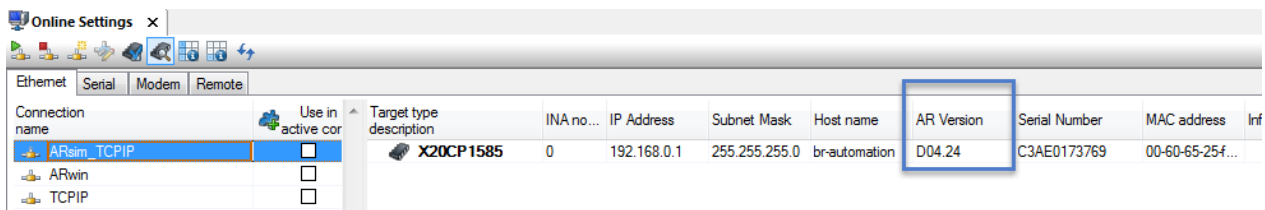
3 Commissioning in Automation Studio

3.1 Key requirement

A) You have create a new project in Automation Studio and you have Online access to the PLC



B) The PLC contains the latest Automation Runtime version too

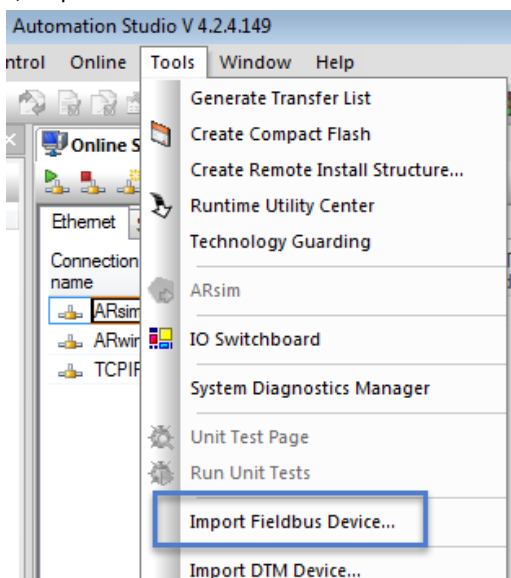


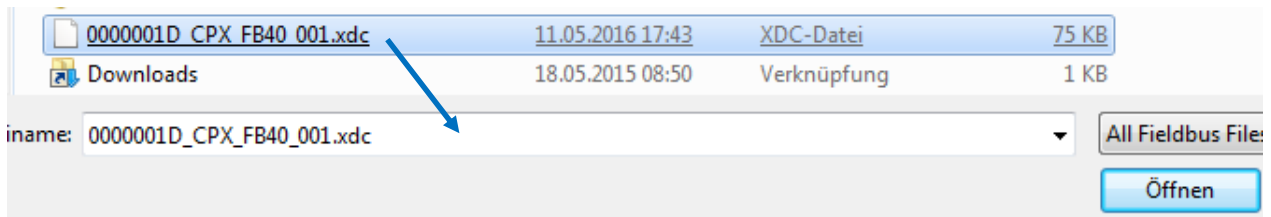
Note:

It is recommended to use always the latest Automation Studio version and Runtime version. If your PLC has an older runtime like e.g. D 3.09 or lower then please update it. Therefore contact the B&R support.

3.2 Import the created .XDC file

A) Import device





Note:

The FMT Tool create the file name automatically and the description “...._001.XDC” belongs to the Powerlink address settings on the node

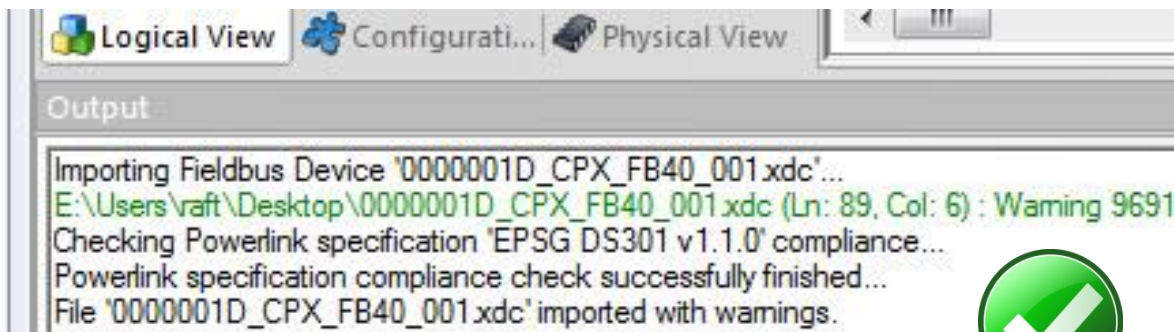
2.4.7 Setting the station number

The station number is set binary coded using the DIL switch elements 3.1 to 3.8.

Station number	Setting DIL switch 3		
Permissible station numbers: 1 ... 239	<input type="checkbox"/>	3.8:	2 ⁷ 128
	<input type="checkbox"/>	3.7:	2 ⁶ 64
	<input type="checkbox"/>	3.6:	2 ⁵ 32
	<input type="checkbox"/>	3.5:	2 ⁴ 16
	<input type="checkbox"/>	3.4:	2 ³ 8
	<input type="checkbox"/>	3.3:	2 ² 4
	<input type="checkbox"/>	3.2:	2 ¹ 2
Factory setting: 1	<input type="checkbox"/>	3.1:	2 ⁰ 1

Tab. 2.5

(Screenshot from CPX-FB40 manual, which you find in the Festo Support Portal)

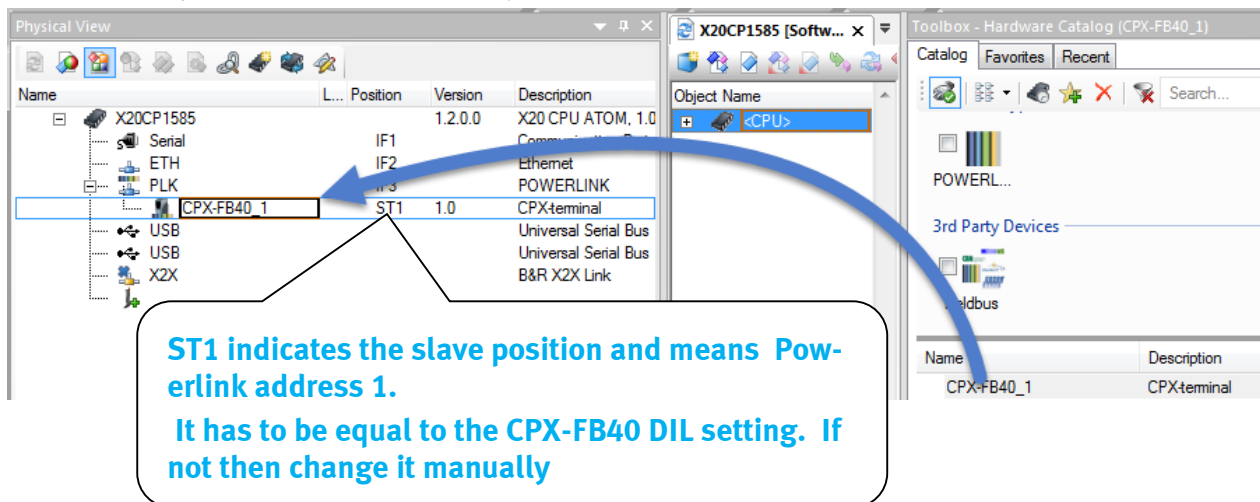


Note:

The warning is not critical and you can ignore it

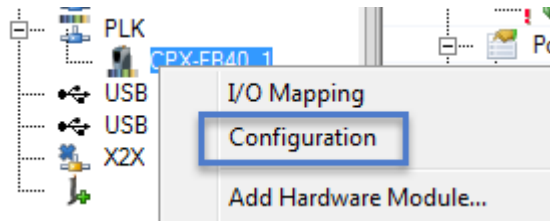
3.3 Create a Powerlink network

A) Drag and Drop the installed CPX-FB40 entry



3.4 Configure the CPX-FB40

A) Open Configuration window



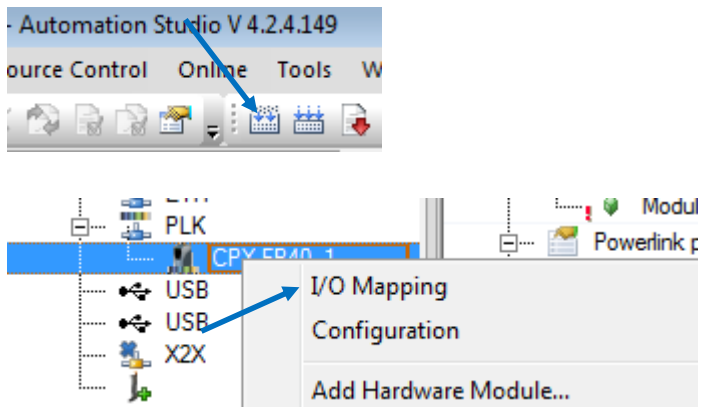
B) It is recommended to deactivate “Module supervised” during **commissioning / testing phase**

Name	Value	Description
CPX-FB40_1		
General		
Module supervised	off	Service mode if there is no hardware module

C) Activate the cyclic transmission **on each module manually**

Channels	Objects for cyclic transmission
slot 1 - 8DI-D - Input module...	
DigitalInput_I2001_S01	
Cyclic transmission	Read
Datatype	OCTET[1]
	Inputs: 8 x 1 Bit
slot 2 - 16DI - Input module...	
DigitalInput_I2002_S01	
Cyclic transmission	Read
Datatype	OCTET[2]
	Inputs: 16 x 1 Bit
slot 3 - 2AI - Analogue input...	
AnalogueInput_I2003_...	
Cyclic transmission	Read
Datatype	OCTET[4]
	Inputs: 2 x 16 Bit
slot 4 - MPA1S - Pneumatic ...	
DigitalOutput_I2004_S...	
Cyclic transmission	Write
Datatype	OCTET[1]
Init value	
	Outputs: 8 x 1 Bit
	Set at bootup (clear to preserve value on device)
slot 5 - VPPM Display - Prop...	
AnalogueInput_I2005_...	
Cyclic transmission	Read
Datatype	OCTET[2]
	Inputs: 1 x 16 Bit
AnalogueOutput_I200...	
Cyclic transmission	Write
Datatype	OCTET[2]
Init value	
	Outputs: 1 x 16 Bit
	Set at bootup (clear to preserve value on device)
slot 6 - MPA2G - Pneumatic ...	
DigitalOutput_I2006_S...	
Cyclic transmission	Write
Datatype	OCTET[1]
Init value	
	Outputs: 4 x 1 Bit
	Set at bootup (clear to preserve value on device)
Device specific parameters	Transmitted to the device at startup
Simulation	
Simulation device	Assigned simulation device

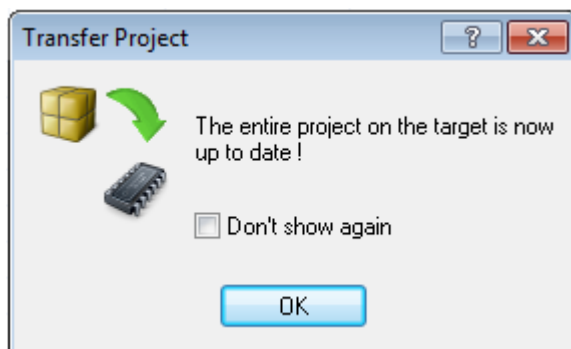
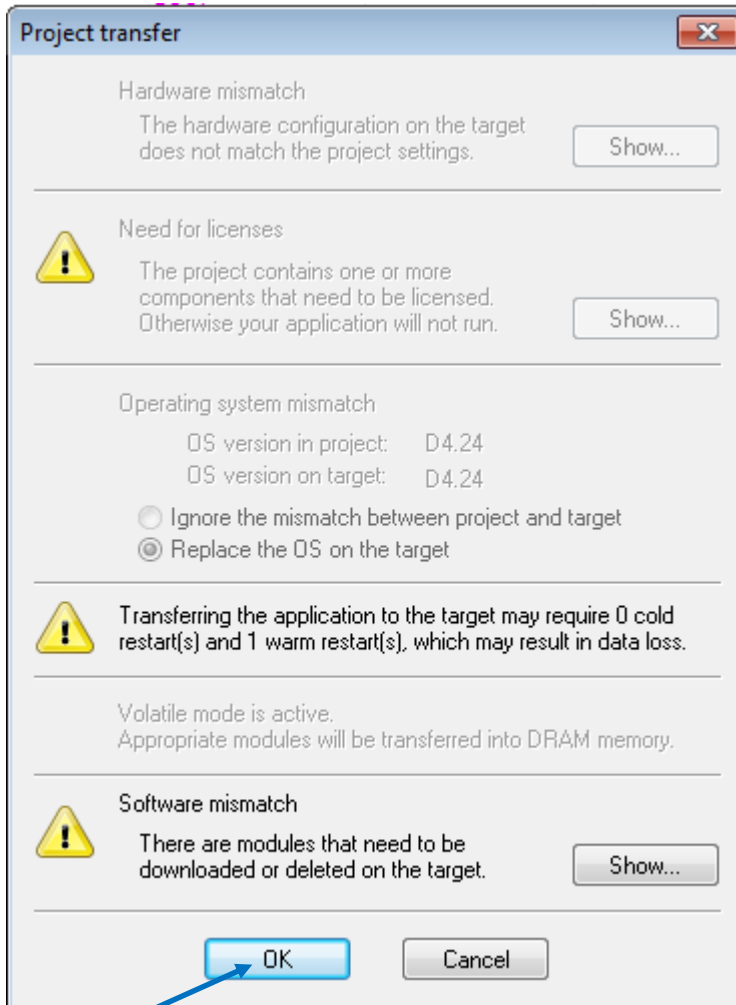
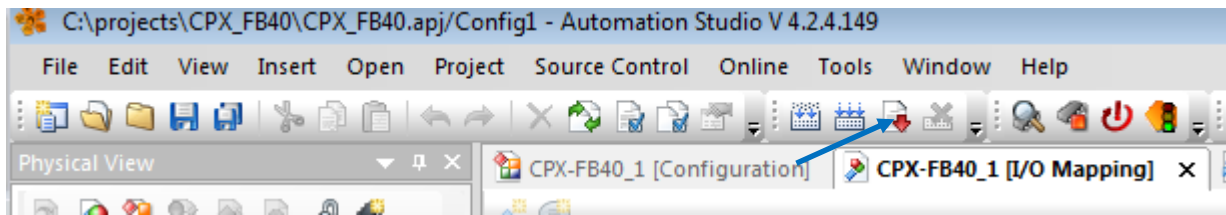
D) Build the project and check the I/O configuration



Channel Name	Process Variable	Data Type	Task Class
ModuleOk		BOOL	
slot_1_DigitalInput_CH0		BOOL	
slot_1_DigitalInput_CH1		BOOL	
slot_1_DigitalInput_CH2		BOOL	
slot_1_DigitalInput_CH3		BOOL	
slot_1_DigitalInput_CH4		BOOL	
slot_1_DigitalInput_CH5		BOOL	
slot_1_DigitalInput_CH6		BOOL	
slot_1_DigitalInput_CH7		BOOL	
slot_2_DigitalInput_CH0		BOOL	
slot_2_DigitalInput_CH1		BOOL	
slot_2_DigitalInput_CH2		BOOL	
slot_2_DigitalInput_CH3		BOOL	
slot_2_DigitalInput_CH4		BOOL	
slot_2_DigitalInput_CH5		BOOL	
slot_2_DigitalInput_CH6		BOOL	
slot_2_DigitalInput_CH7		BOOL	
slot_2_DigitalInput_CH8		BOOL	
slot_2_DigitalInput_CH9		BOOL	
slot_2_DigitalInput_CH10		BOOL	
slot_2_DigitalInput_CH11		BOOL	
slot_2_DigitalInput_CH12		BOOL	
slot_2_DigitalInput_CH13		BOOL	
slot_2_DigitalInput_CH14		BOOL	
slot_2_DigitalInput_CH15		BOOL	
slot_3_AnalogueInput_CH0		UINT	
slot_3_AnalogueInput_CH1		UINT	
slot_4_DigitalOutput_CH0		BOOL	
slot_4_DigitalOutput_CH1		BOOL	
slot_4_DigitalOutput_CH2		BOOL	
slot_4_DigitalOutput_CH3		BOOL	
slot_4_DigitalOutput_CH4		BOOL	
slot_4_DigitalOutput_CH5		BOOL	
slot_4_DigitalOutput_CH6		BOOL	
slot_4_DigitalOutput_CH7		BOOL	
slot_5_AnalogueInput_CH		UINT	
slot_5_AnalogueOutput_CH		UINT	
slot_6_DigitalOutput_CH0		BOOL	
slot_6_DigitalOutput_CH1		BOOL	
slot_6_DigitalOutput_CH2		BOOL	
slot_6_DigitalOutput_CH3		BOOL	

If you see all module variables then continue

3.5 Download the project

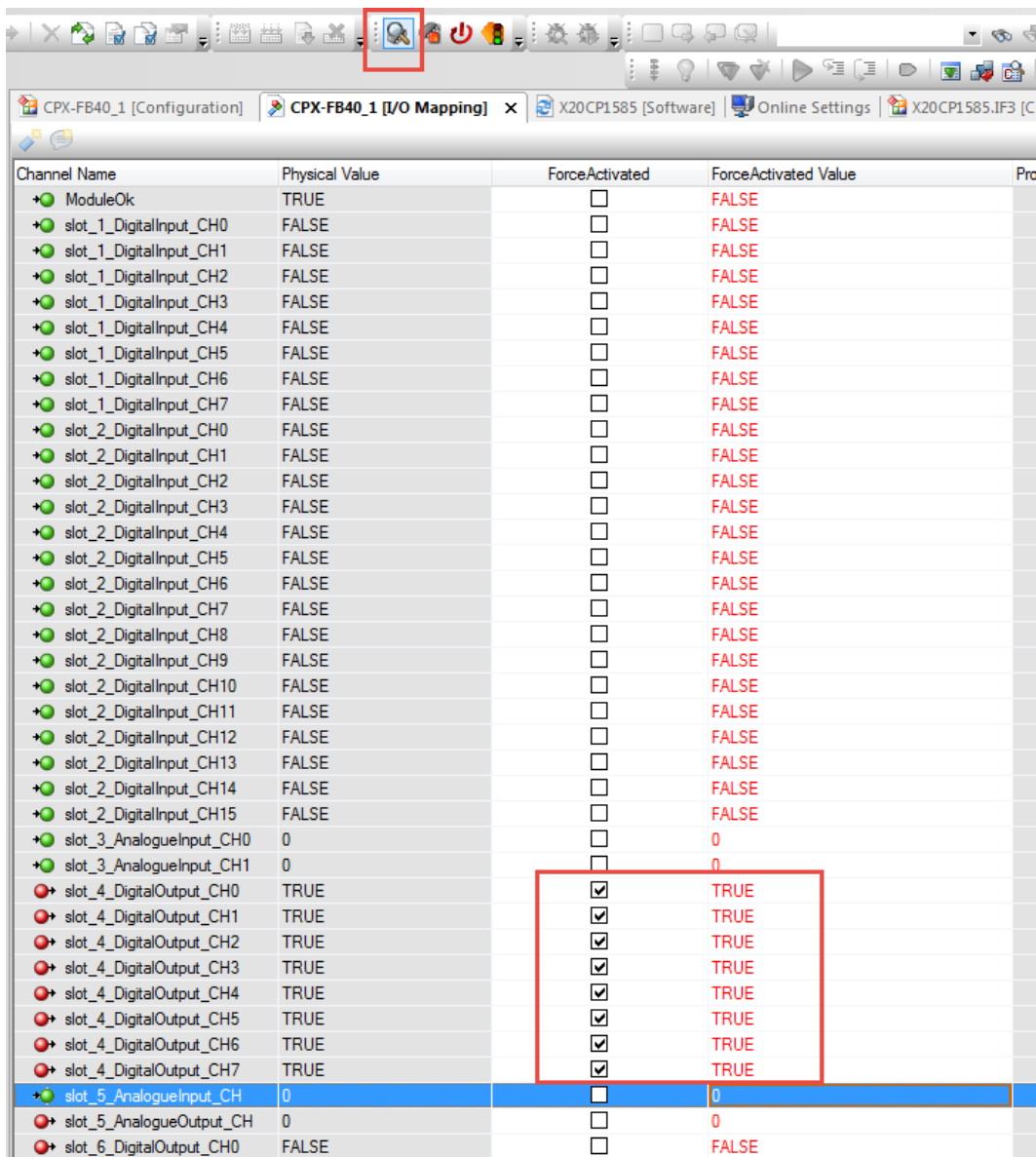


3.6 Activate Monitoring to check the I/O mapping module status

The screenshot shows the Studio V 4.2.4.149 interface. The top menu bar includes 'Online', 'Tools', 'Window', and 'Help'. The toolbar contains various icons, with a blue arrow pointing to the 'I/O Mapping' icon. The main window displays the 'CPX-FB40_1 [I/O Mapping]' configuration. A table lists channel names and their physical values. A callout box points to the 'ModuleOk' row, which has a 'Physical Value' of 'TRUE'. The callout text reads: 'Only if this value is true the communication is established!'.

Channel Name	Physical Value	Force Activated	Force Activated Value
ModuleOk	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_1_DigitalInput_CH0	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH1	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH2	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH3	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH4	FALSE	<input type="checkbox"/>	FALSE

3.7 Test e.g. valves via forcing function in Automation Studio



Channel Name	Physical Value	ForceActivated	ForceActivated Value
ModuleOk	TRUE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH0	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH1	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH2	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH3	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH4	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH5	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH6	FALSE	<input type="checkbox"/>	FALSE
slot_1_DigitalInput_CH7	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH0	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH1	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH2	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH3	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH4	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH5	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH6	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH7	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH8	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH9	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH10	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH11	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH12	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH13	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH14	FALSE	<input type="checkbox"/>	FALSE
slot_2_DigitalInput_CH15	FALSE	<input type="checkbox"/>	FALSE
slot_3_AnalogueInput_CH0	0	<input type="checkbox"/>	0
slot_3_AnalogueInput_CH1	0	<input type="checkbox"/>	0
slot_4_DigitalOutput_CH0	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_4_DigitalOutput_CH1	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_4_DigitalOutput_CH2	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_4_DigitalOutput_CH3	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_4_DigitalOutput_CH4	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_4_DigitalOutput_CH5	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_4_DigitalOutput_CH6	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_4_DigitalOutput_CH7	TRUE	<input checked="" type="checkbox"/>	TRUE
slot_5_AnalogueInput_CH	0	<input type="checkbox"/>	0
slot_5_AnalogueOutput_CH	0	<input type="checkbox"/>	0
slot_6_DigitalOutput_CH0	FALSE	<input type="checkbox"/>	FALSE

