Maxsine 迈信电气

Technical White Paper

Getting Started with Maxsine EP3E-PN on SIEMENS SIMATIC S7-1200/1500 Motion Control

Key words：EP3E-PN，SIMATIC S7-1200/1500

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Revise records

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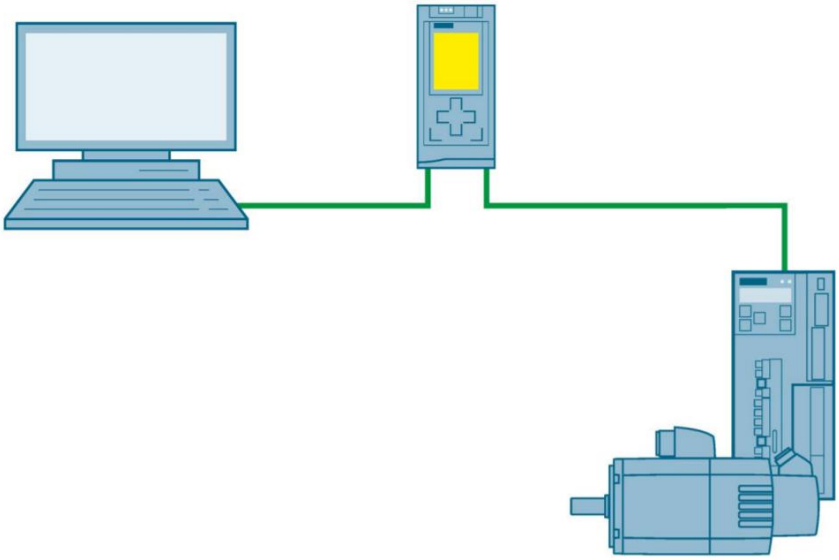
1. “Getting started” objectives

"Getting Started" provides an introduction to configuring Maxsine EP3E-PN in conjunction with a technology object Axis of a SIMATIC S7-1500/1200 in the TIA Portal Engineering System. You create a simple sample project by performing the typical optimization and configuration steps for the device, drive and axis configuring. You become acquainted with the most important tools that the TIA Portal provides for the configuring, commissioning and diagnostics of the Maxsine EP3E- PN drive.



2. Drive system overview

1) EP3E-PN could communicate with SIMATIC PLC via PROFINET, support PROFIdrive protocal. EP3E-PN could be integrated in the TIA Portal and be interconnected with S7-1200, S7-1500 via PROFINET.
2) EP3E-PN can be operated on a technology object (TO) to realize speed control (position control mode will be supported later) for the Axis type of a SIMATIC S7-1500, S7-1500 T-CPU and S7-1200
3) EP3E-PN support Standard telegram 3 and Standard telegram5, isochronous operation, and DSC mode

3. Preparing the System

- The hardware is preassembled and wired.
- The latest firmware of the EP3E-PN is available.
- PC is connected directly with the PROFINET interface of the controller

(S7-1500/1200) via the Ethernet line.

- TIA Portal (at least V14) is installed on the PC.
- The TIA Portal is open. The portal view is open on the PC screen

4. Configuration Steps

4.1 Preparing the Configuration

Hardware preparing

1) Power, Motor, encoder and motor holding brake are connected to the drive, see <Maxsine EP3E-PN network servo drive manual>

2) The ports of the PROFINET interfaces are wired in accordance with the port interconnection. Please connect SIMATIC controller(S7-1200/1500) PROFINET/IRT port to EP3E-PN's X5 port, and connect this EP3E-PN's X6 port to next EP3E-PN's X5 port (if there is second EP3E-PN drive)

3) PC is connected directly with the PROFINET interface of the controller (S7-1200/1500) via the Ethernet line.

4) TIA Portal (at least V14) is installed on the PG/PC.

Preparing Device description file (GSDML)

Download EP3E PROFINET GSDML folder from maxsine website (www.maxsine.com) and save to PC.

EP3E-PN configuration

- Setting the following parameter of EP3E-PN
- Set P304 to 1, enable PROFINET mode
- Set P302 for telegram, default is 3

4.2 Create simple project

Create New Project

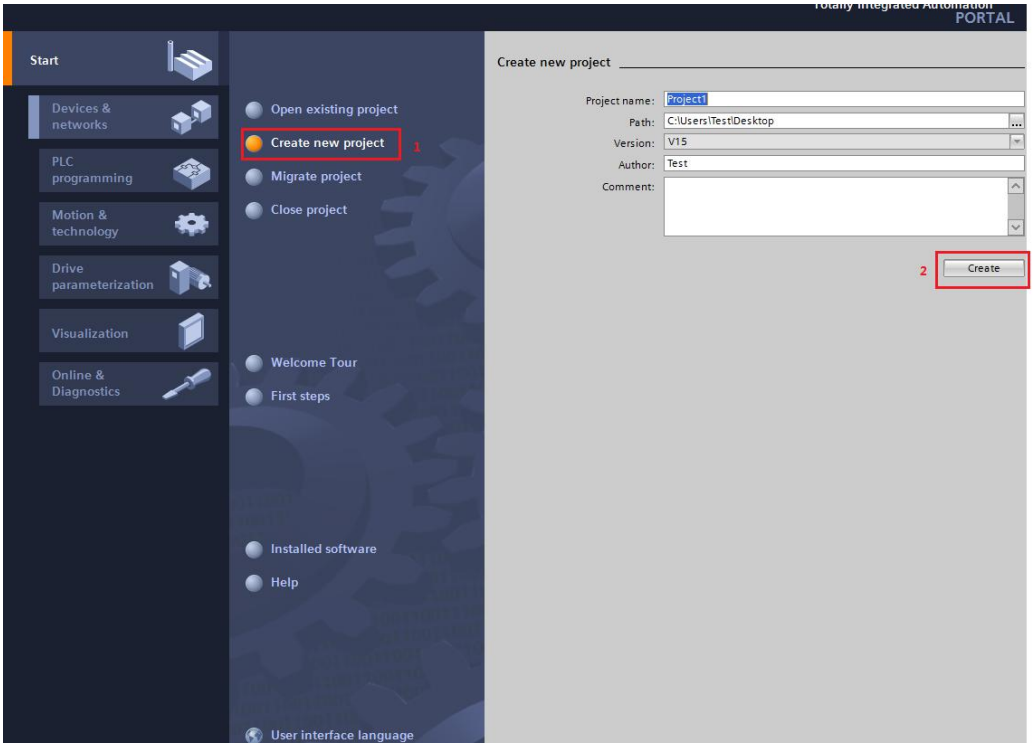
You begin a new configuring by creating a new project in the TIA Portal.

1) Select "Start" > "Create new project" in the portal view navigation. The "Create new project" dialog opens.

2) Enter the project name at "Project name", e.g. "EP3EPN Sample".

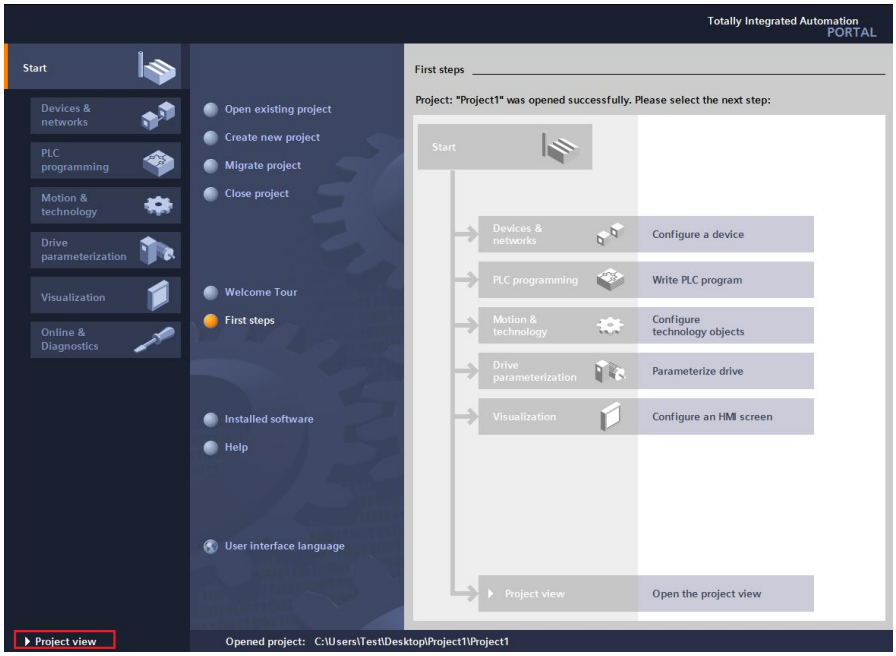
3) Enter the project location at "Path". The default path is already set.

4) Confirm with "Create".

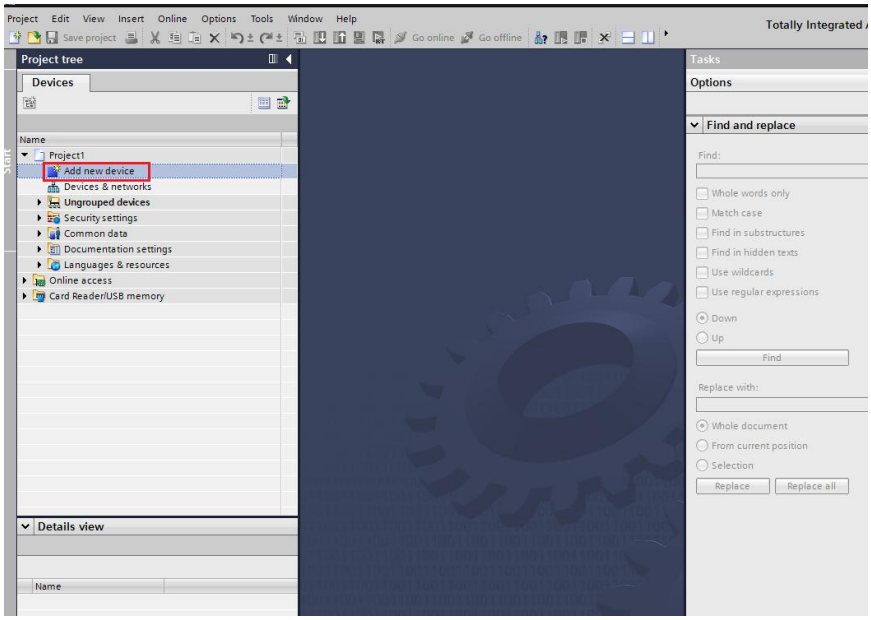


Adding and connecting device

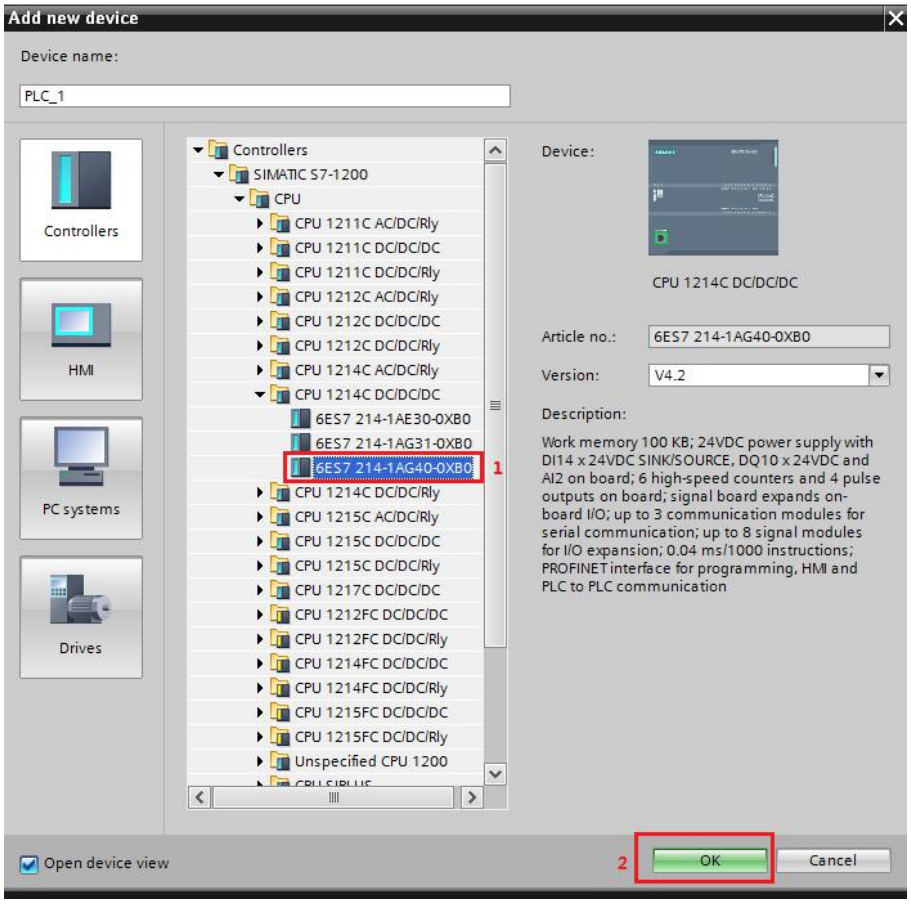
1) Open the project view of the TIA Portal by clicking the "Open project view" button and double-click "Devices and networks" in the Project Navigator.



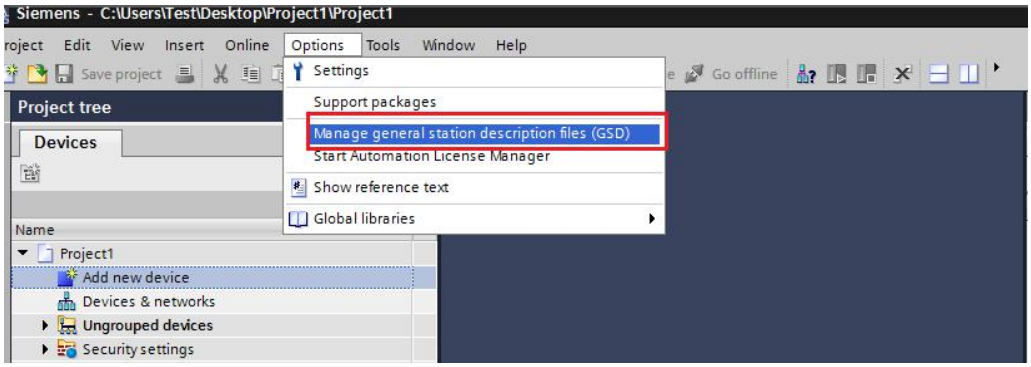
2) The network view opens. The hardware catalog appears on the right-hand side，Then you can double-click “Add new drive”.



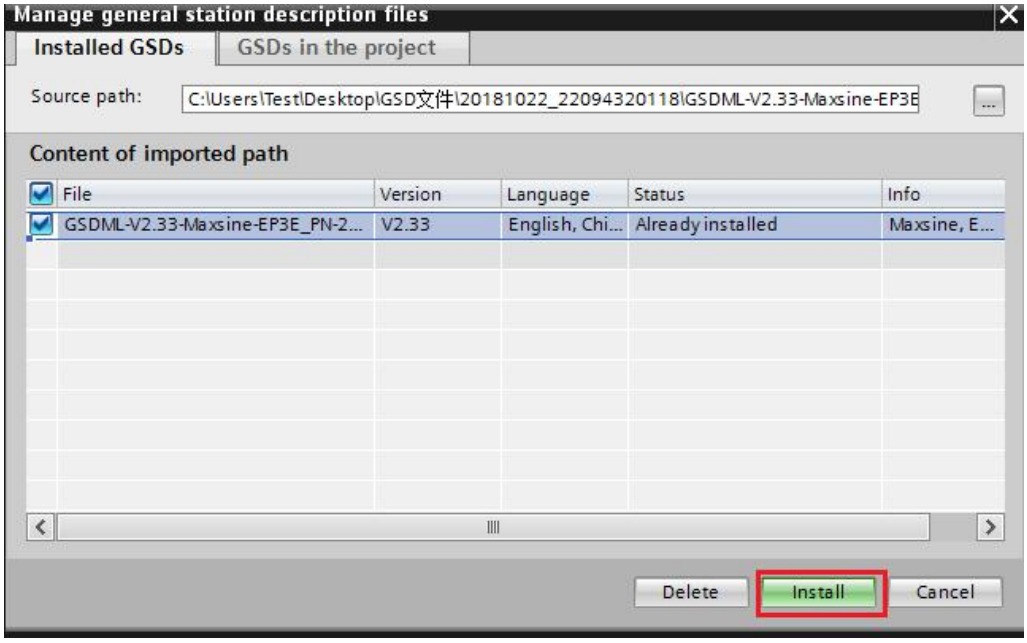
3) Select an appropriate controller (SIMATIC S7-1200/CPU 1214C DC/DC/DC/6ES7 214-1AG40-0XB0) from "Controller" > "CPU" in the hardware catalog and drag it with drag-and-drop to the network view.



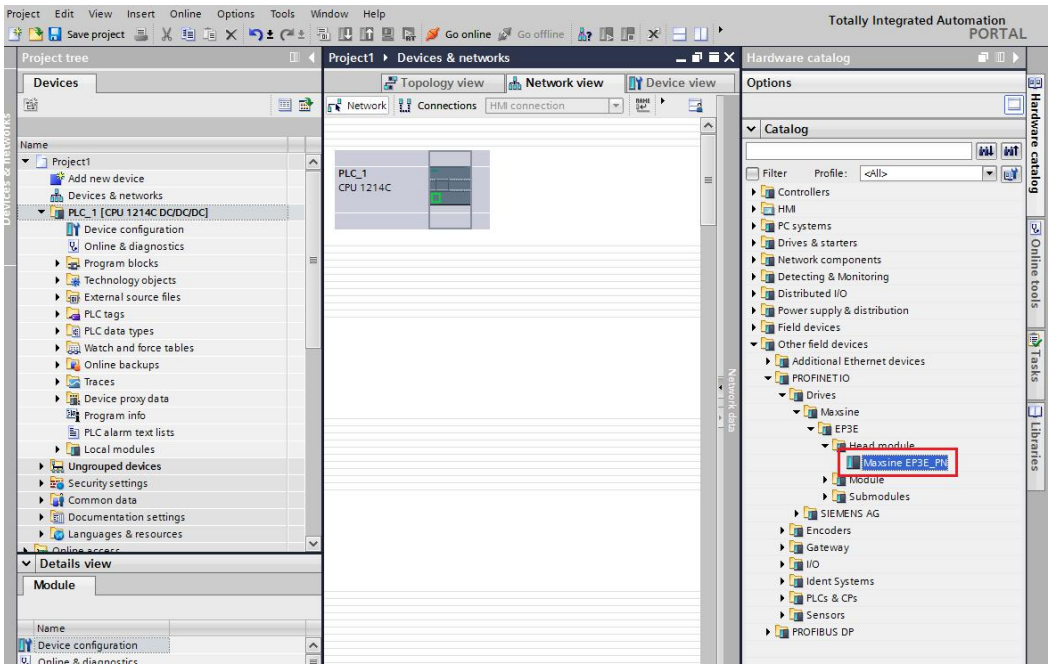
4) Click the “options”and select “Manage general station description files(GSD)”。



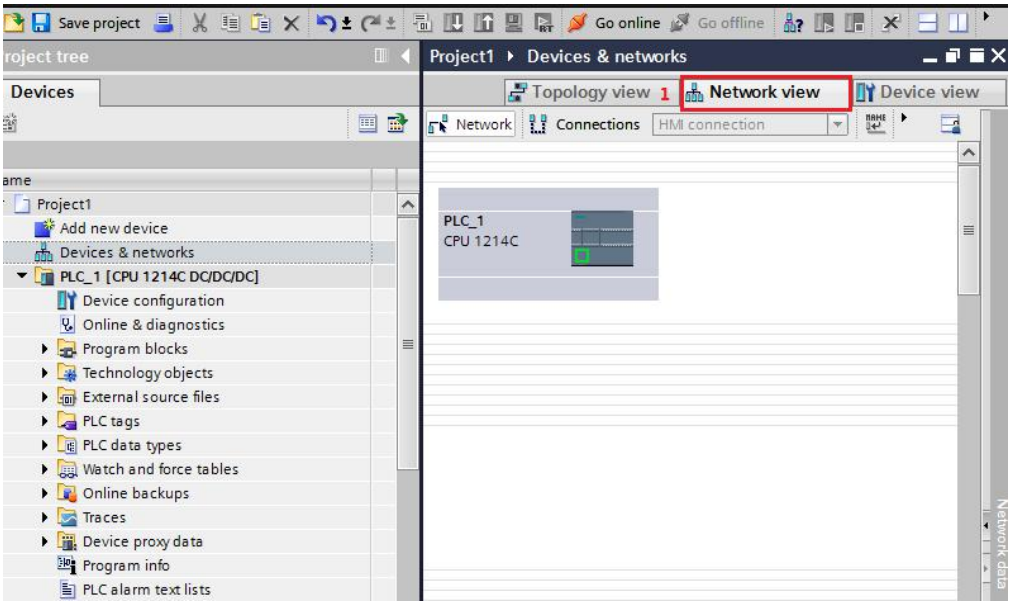
5) Find the EP3E PROFINET GSDML file and select it. Press the “install” button to install it

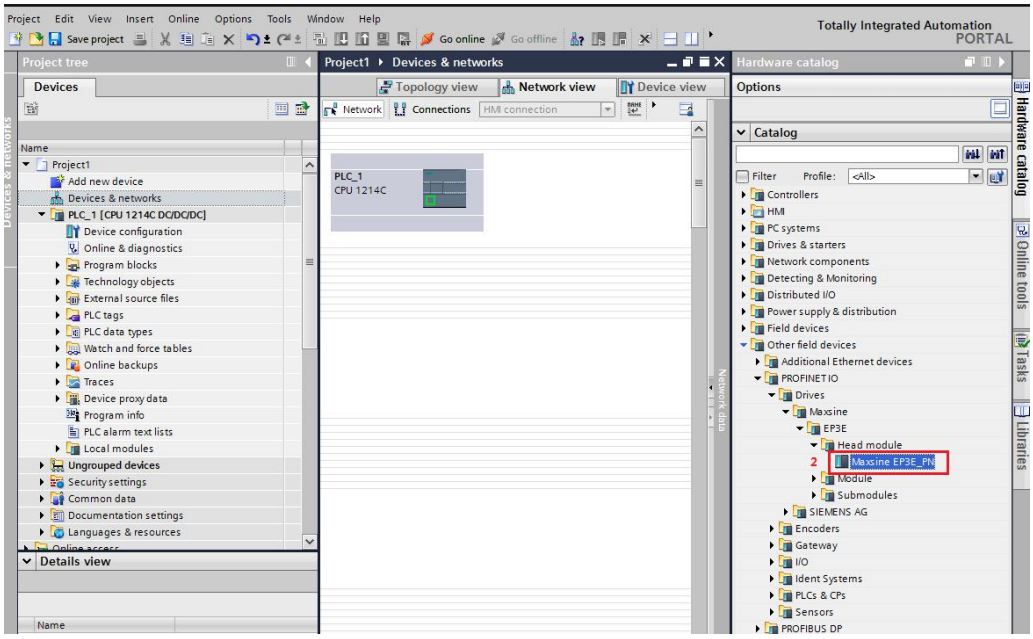


6) Unselect “filter”, click “other field device”-“PROFINET IO”—“Drives”—“Maxsine”—“EP3E”—“Head module”—“Maxsine EP3E_PN”。



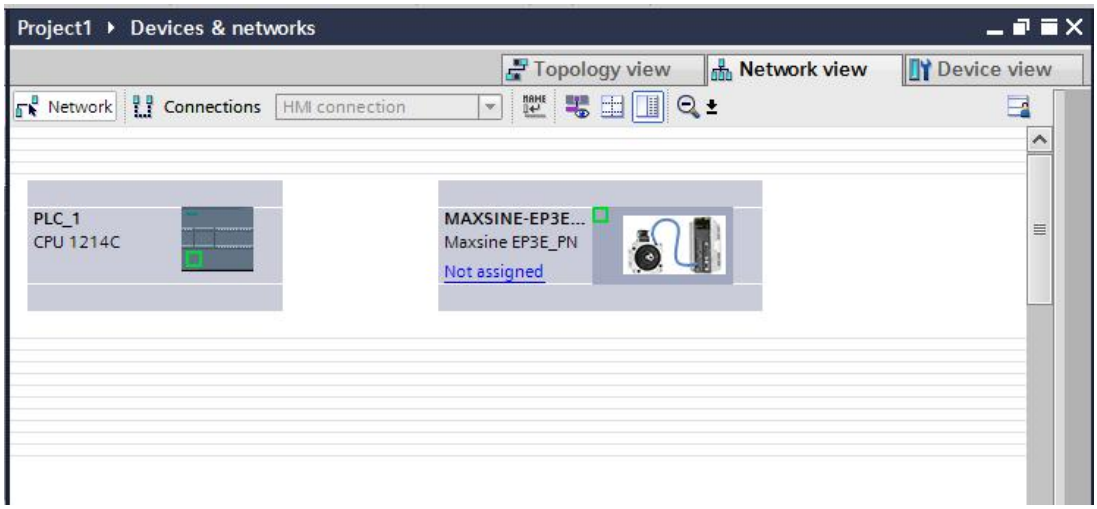
7) Select “network view”, repeat previews operation to find “Maxsine EP3E_PN”, double click or drag it with drag-and-drop to the network view

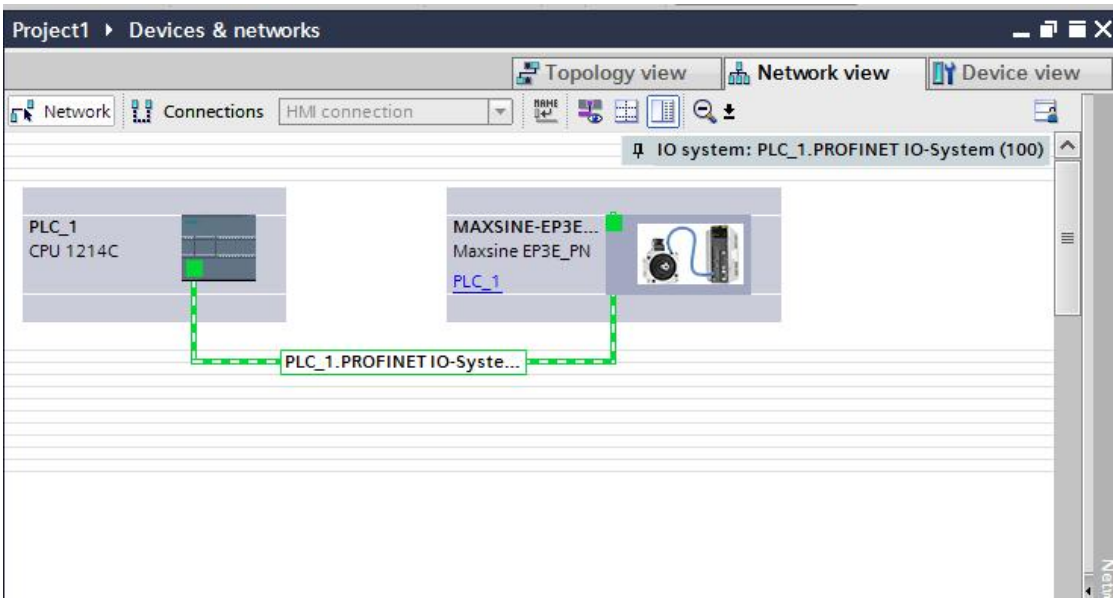




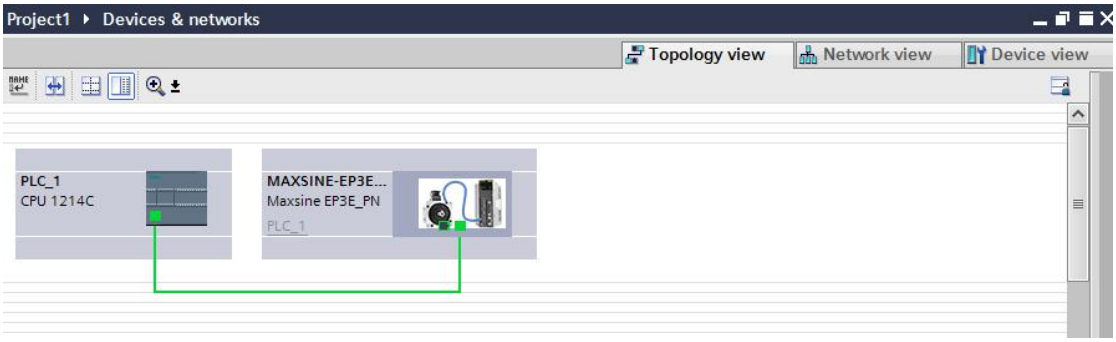
8) Connecting EP3E-PN with PLC(S7-1200/1500)

After adding the drive, it must first be assigned to an IO Controller or to a PLC. This automatically makes the assignment to an appropriate subnet. Provided no subnet has been assigned the drive, it will be displayed as "not assigned device" in the Project Navigator (PNV). The nodes of a subnet form a PROFINET IO system. Assign the drive to the controller. Click the "Not assigned" link in the network view and select an interface to which you assign the drive. After assigning the drive, a sync domain and a PROFINET IO system are created automatically.

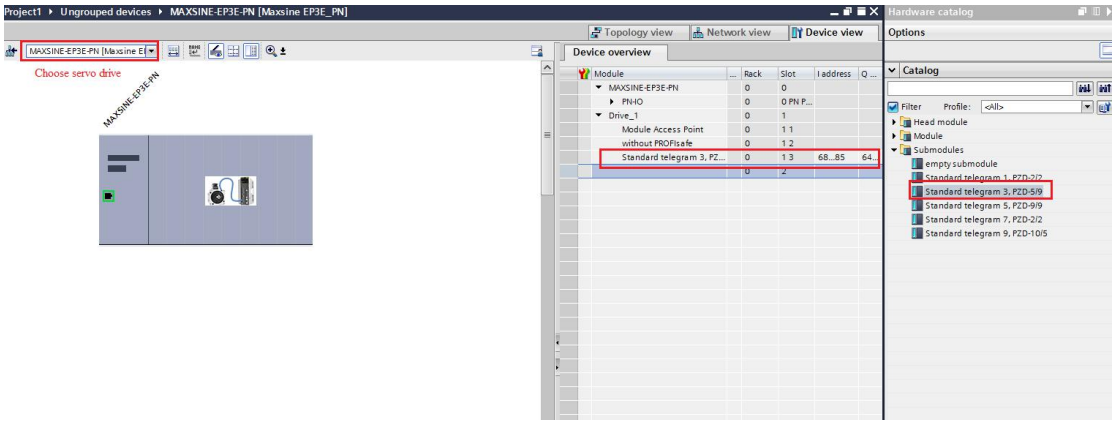




9) Select “topology view”, connect the PLC to EP3E_PN（port X5）。



10) Adding telegram. Select drive, “other field device”→“PROFINET IO” →“Drives” →“Maxsine” →“EP3E” → “submodules”→“Standard telegram 3”.



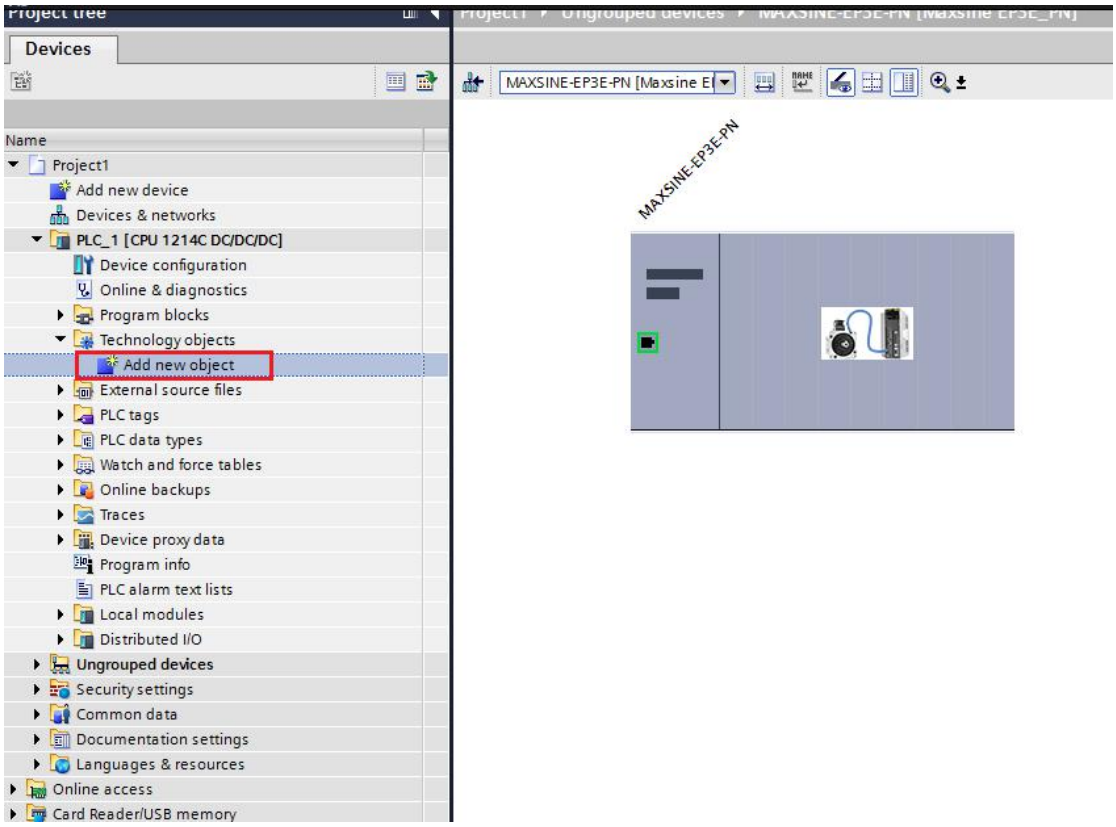
Configure the axis

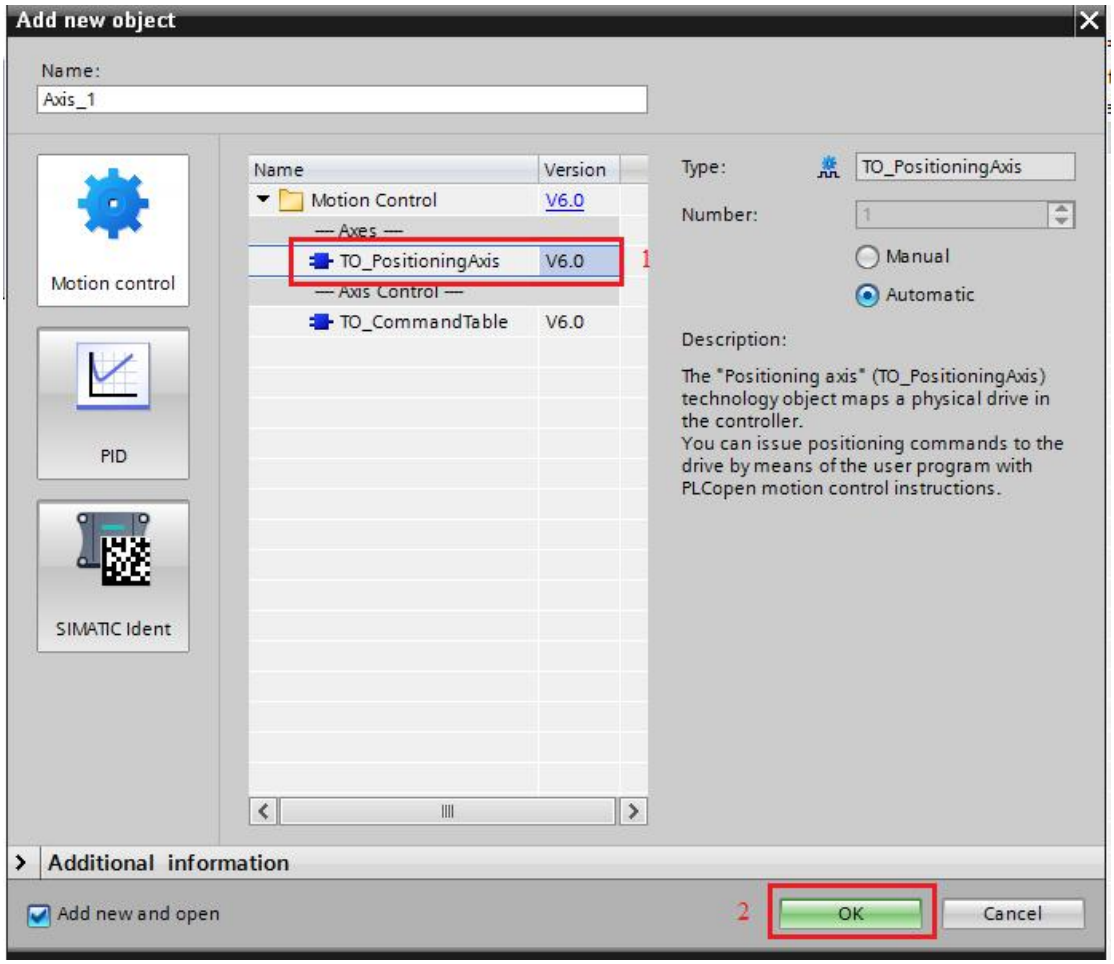
1) Open the Controller folder in the Project Navigator and select "Technology objects".

2) Double-click "Add new object". The "Add new object" dialog opens.

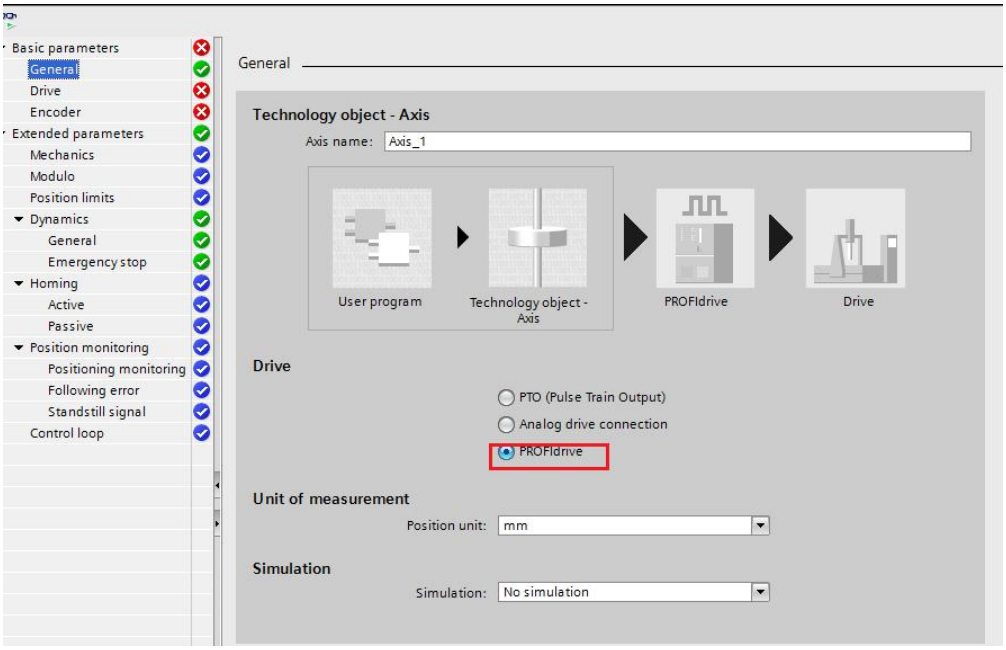
3) Select from "Motion Control" a "TO_PositioningAxis" positioning axis.

4) Enter a name for the axis. Use the designation "Axis_1" for the axis of the sample project.





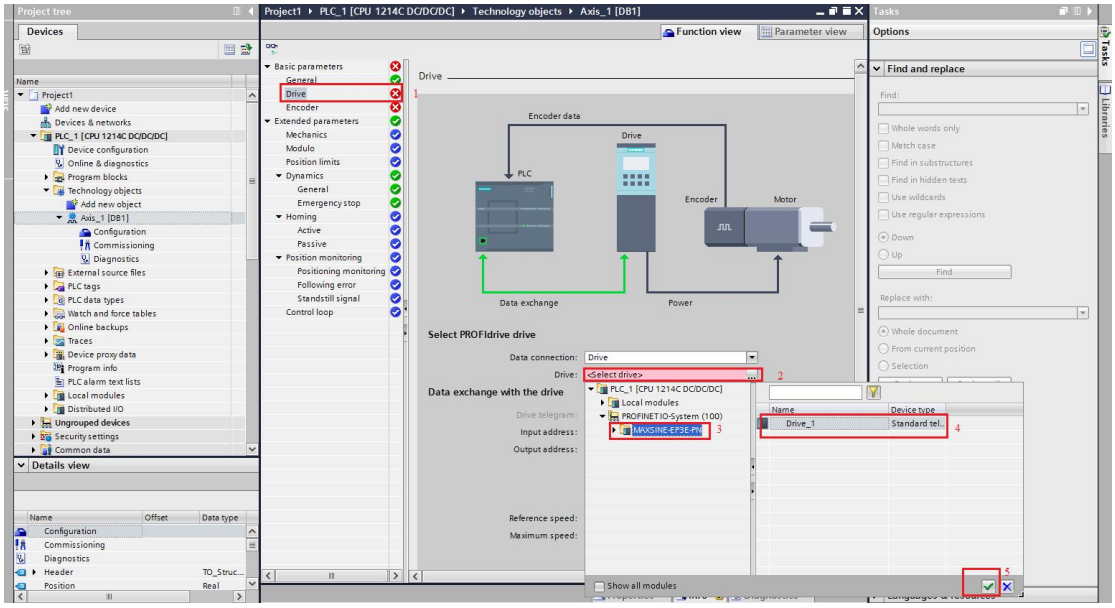
5) Axis1 configration, select “PROFIdrive”。

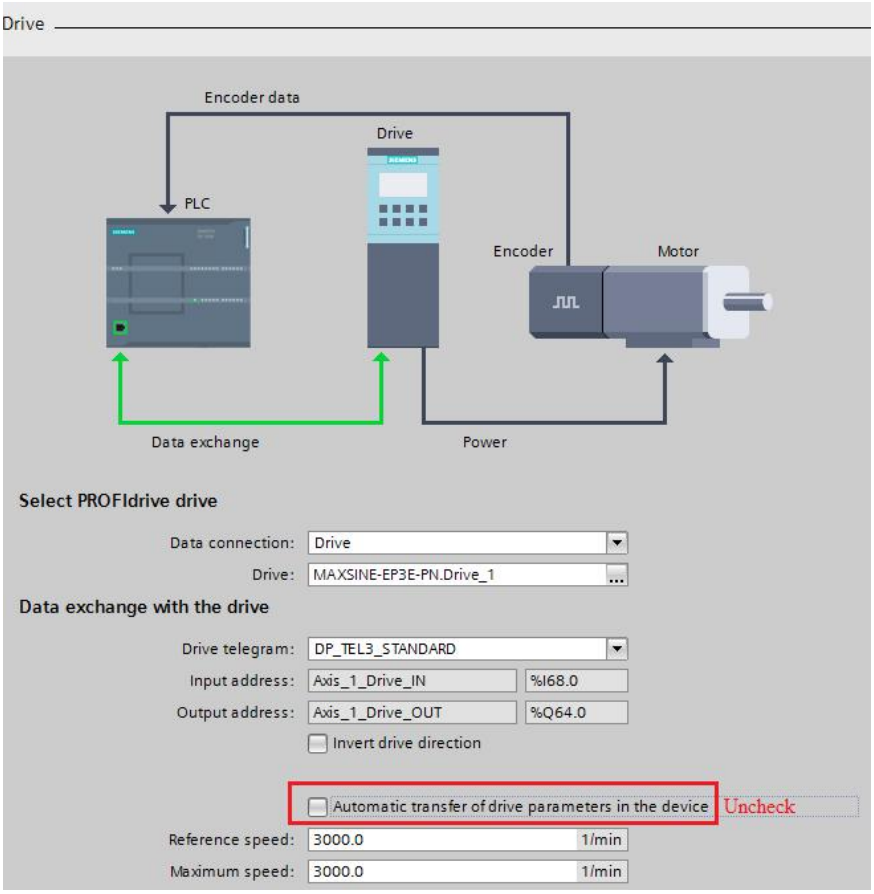


6) EP3E-PN basic parameter configuration

Drive Configuration

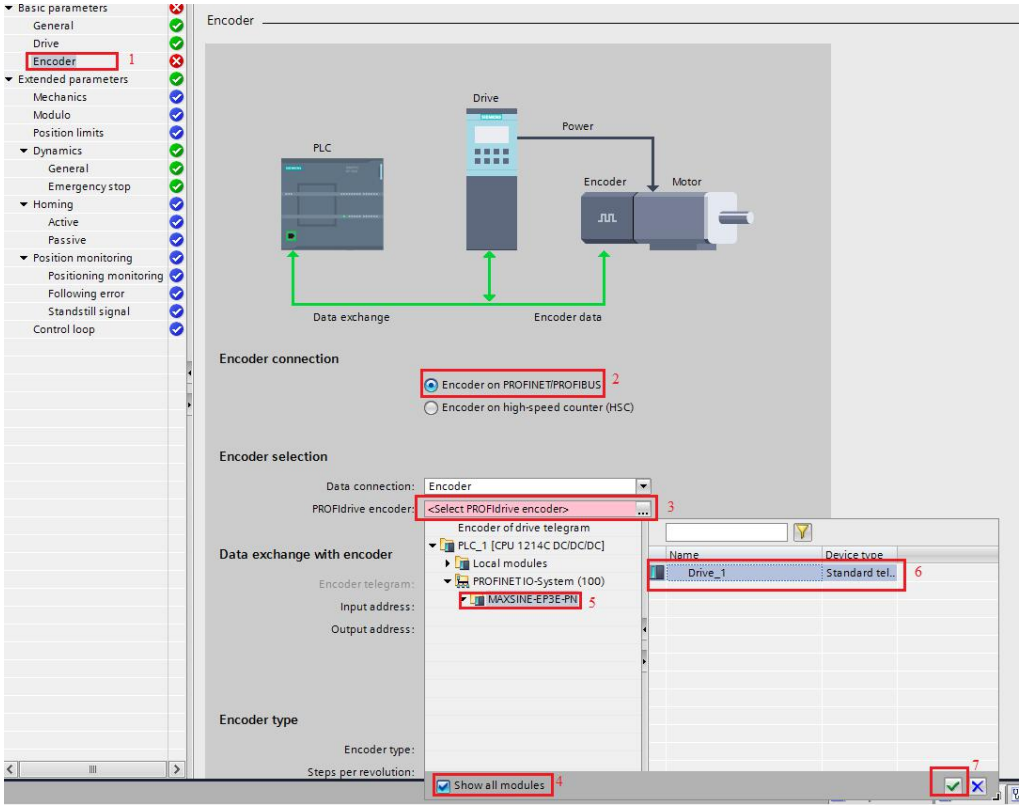
- Click Drive, “Select PROFIdrive drive”—“Drive”—“ PROFINET IO-SYSTEM(100)”—"MAXSINE-EP3E-PN”
- Select “Standard Telegram 3”
- Unselect “servo drive parameter of auto-transmiting device” option
- Confirm



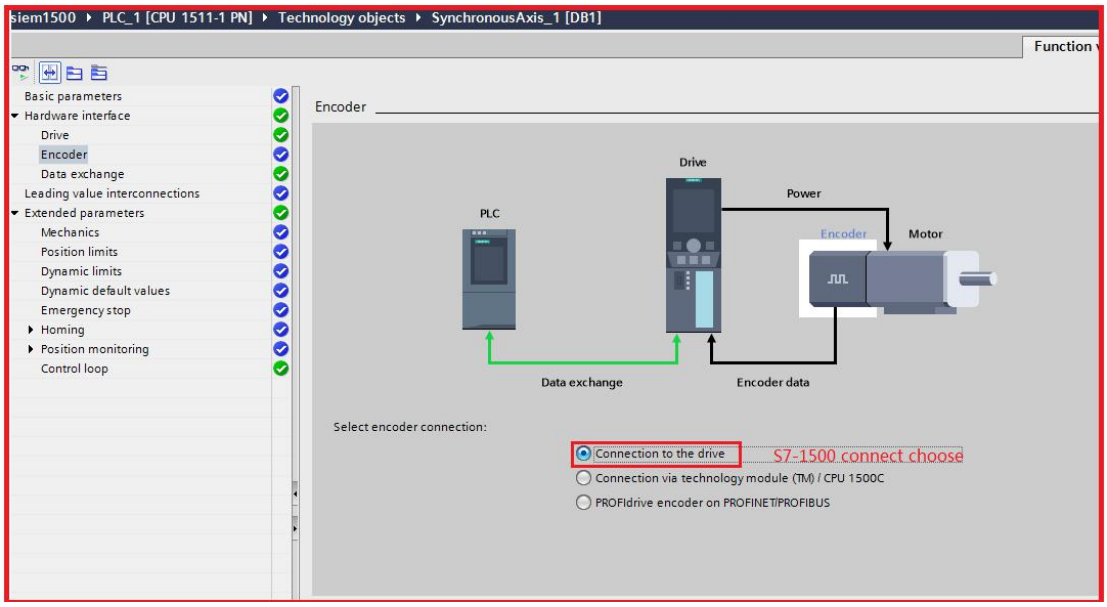


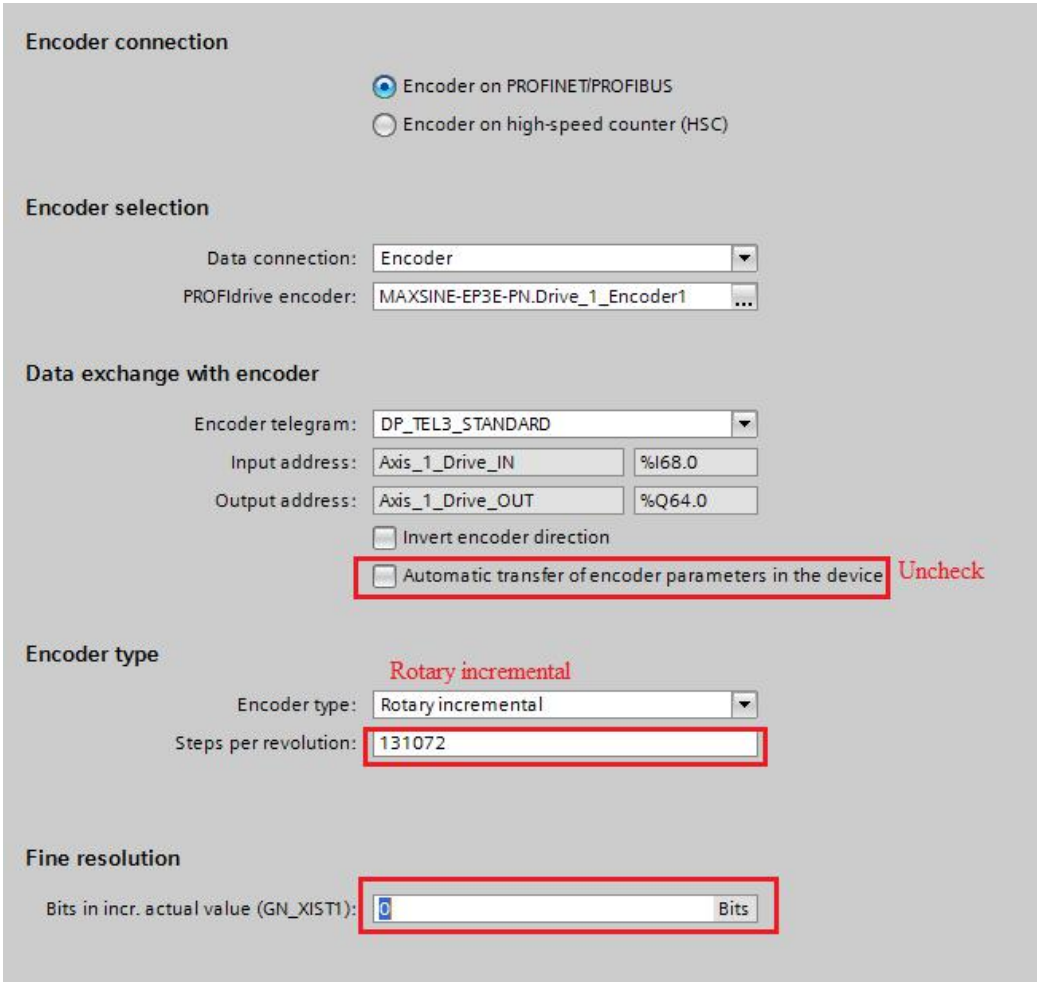
Encoder Configuration

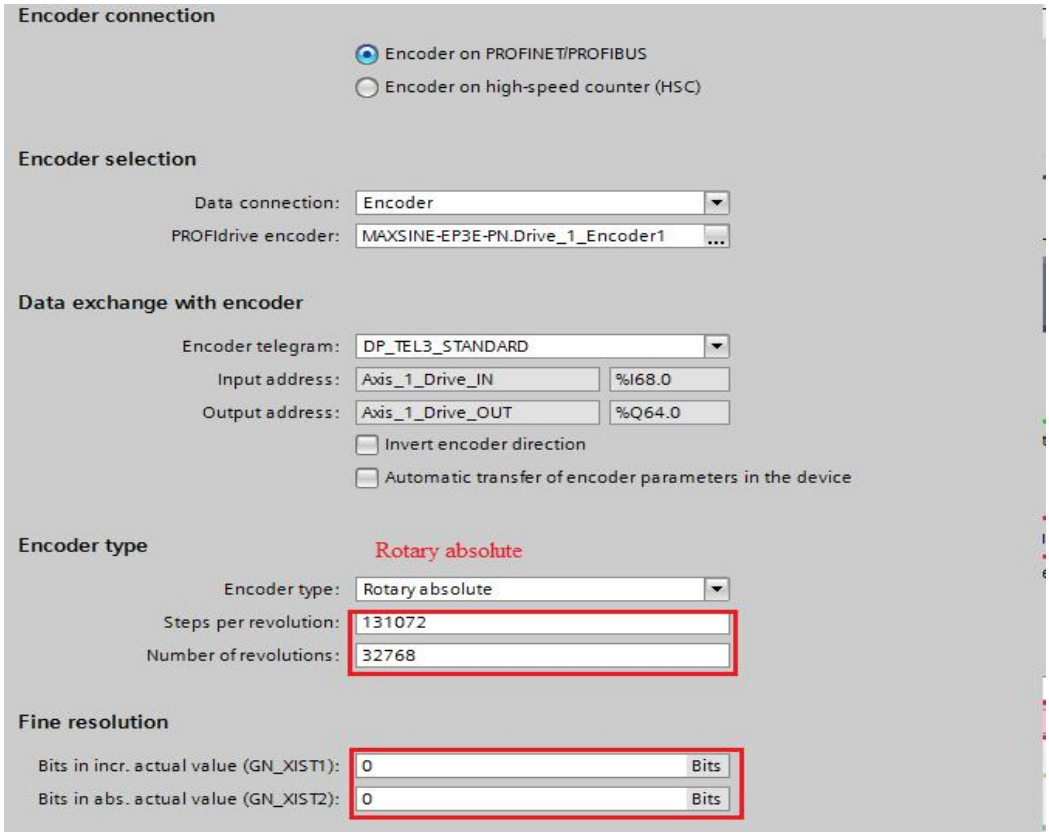
- Click encoder(Note： if you use S7-1500， choose “connect servo drive”) Select “Show all modules”
- Select “Encoder on PROFINET/PROFIBUS”
- Select “PROFIdrive Encoder”—"PROFINET IO-SYSTEM(100)”--“MAXSINE-EP3E-PN” -Standard Telegram 3
- Unselect “Automatic transfer of encoder parameters in the device” option
- For Rotary incremental encoder, set “steps per revolution” to 131072, set “Bits in incr. actual value” to 0
- For Rotary absolute encode, set “steps per revolution” to 131072, “Number of revolutions” to 32768, “Bits in incr. actual value” to 0, “Bits in abs. actual value” to 0



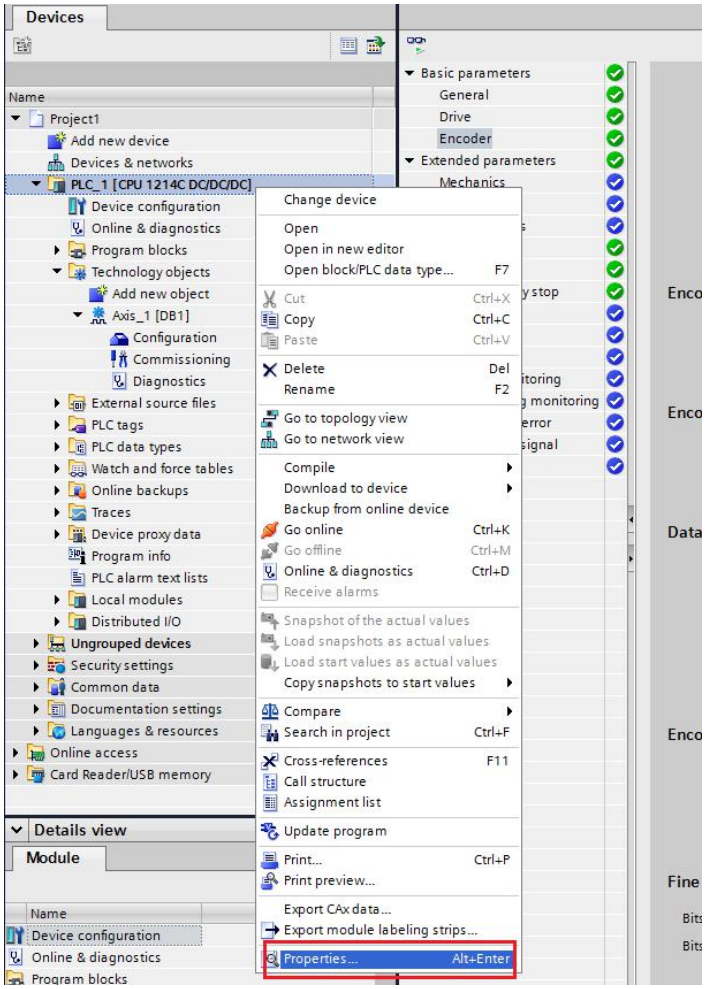
PS： Picture below is for 1500 connection, which is different from 1200.

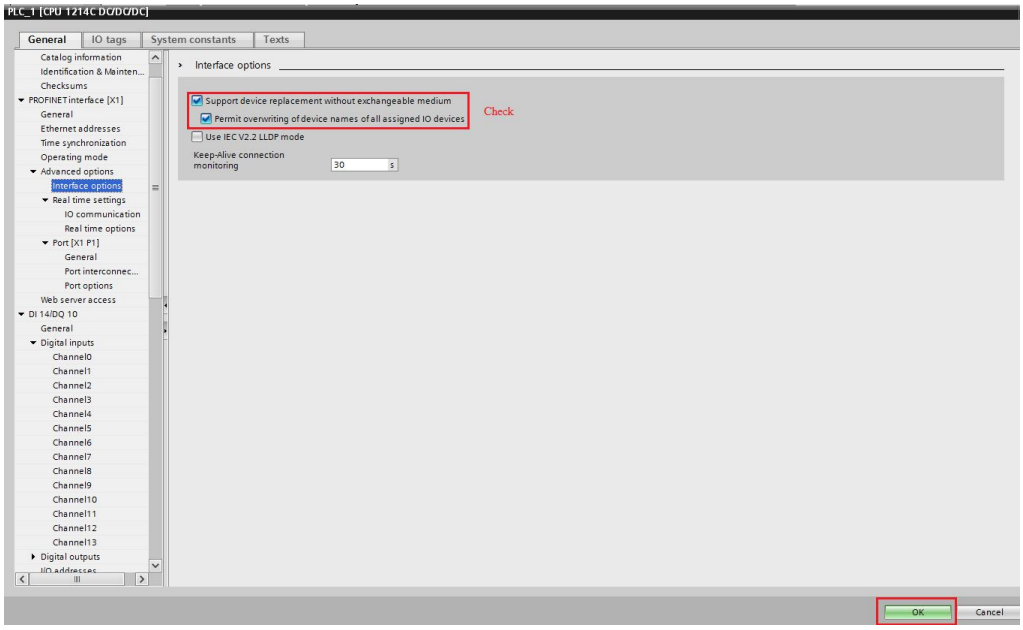



Encoder connection
Encoder on PROFINET/PROFIBUS
Encoder on high-speed counter (HSC)
Encoder selection
Data connection: Encoder
PROFIdrive encoder: MAXSINE-EP3E-PN.Drive_1_Encoder1
Data exchange with encoder
Encoder telegram: DP_TEL3_STANDARD
Input address: Axis_1_Drive_IN %I68.0
Output address: Axis_1_Drive_OUT %Q64.0
Invert encoder direction
Automatic transfer of encoder parameters in the device
Uncheck
Encoder type
Rotary incremental
Encoder type: Rotary incremental
Steps per revolution: 131072
Fine resolution
Bits in incr. actual value (GN_XIST1): 0 Bits



7) Right Click PLC_1, select Properties→PROFINET interface(X1) →Advanced Option→Interface Option. Select “Support device replacement without exchangable medium” and “Permit overwriting of device name of all assigned IO device”.


Devices
Name
Project1
Add new device
Devices & networks
PLC_1 [CPU 1214C DC/DC/DC]
Device configuration
Online & diagnostics
Program blocks
Technology objects
Add new object
Axis_1 [DB1]
Configuration
Commissioning
Diagnostics
External source files
PLC tags
PLC data types
Watch and force tables
Online backups
Traces
Device proxy data
Program info
PLC alarm text lists
Local modules
Distributed I/O
Ungrouped devices
Security settings
Common data
Documentation settings
Languages & resources
Online access
Card Reader/USB memory
Details view
Module
Name
Device configuration
Online & diagnostics
Program blocks
Basic parameters
General
Drive
Encoder
Extended parameters
Mechanics
Change device
Open
Open in new editor
Open block/PLC data type... F7
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename F2
Go to topology view
Go to network view
Compile
Download to device
Backup from online device
Go online Ctrl+K
Go offline Ctrl+M
Online & diagnostics Ctrl+D
Receive alarms
Snapshot of the actual values
Load snapshots as actual values
Load start values as actual values
Copy snapshots to start values
Compare
Search in project Ctrl+F
Cross-references F11
Call structure
Assignment list
Update program
Print... Ctrl+P
Print preview...
Export CAx data...
Export module labeling strips...
Properties... Alt+Enter


PLC_1 [CPU 1214C DC/DC/DC]
General
IO tags
System constants
Texts
Interface options
Support device replacement without exchangeable medium
Permit overwriting of device names of all assigned IO devices
Check
Use IEC V2.2 LLDP mode
Keep-Alive connection monitoring
30
OK
Cancel

Going online

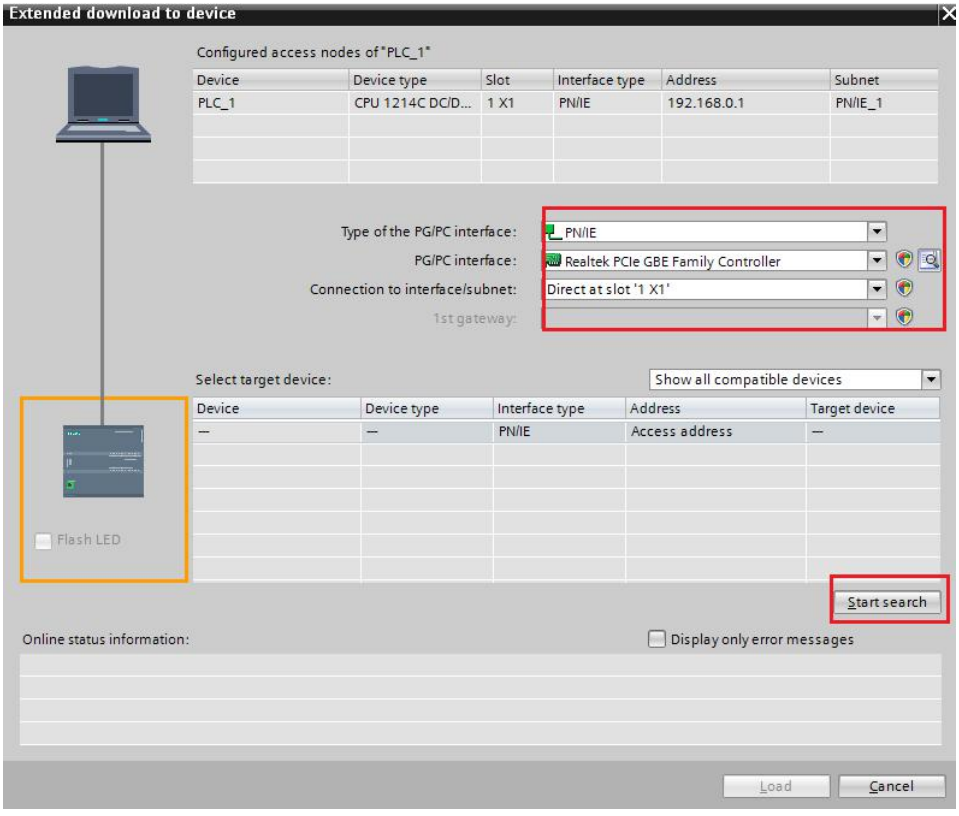
To permit an online connection, your PC and the controller must be in the same subnet. The TIA Portal supports you if your PC does not have any appropriate settings by setting them automatically.

1) Select the appropriate PC interface type and the PC interface.

2) Select the appropriate interface on the controller.

3) Search for accessible network nodes.

4) Connect with the appropriate node (appropriate S7-1500 controller).

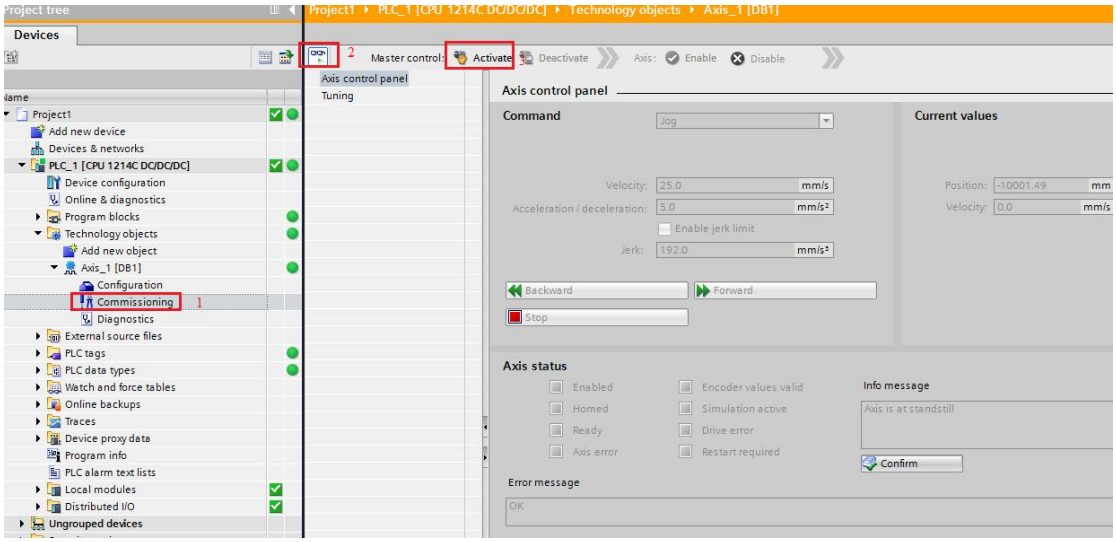


Test the axis with the axis control panel

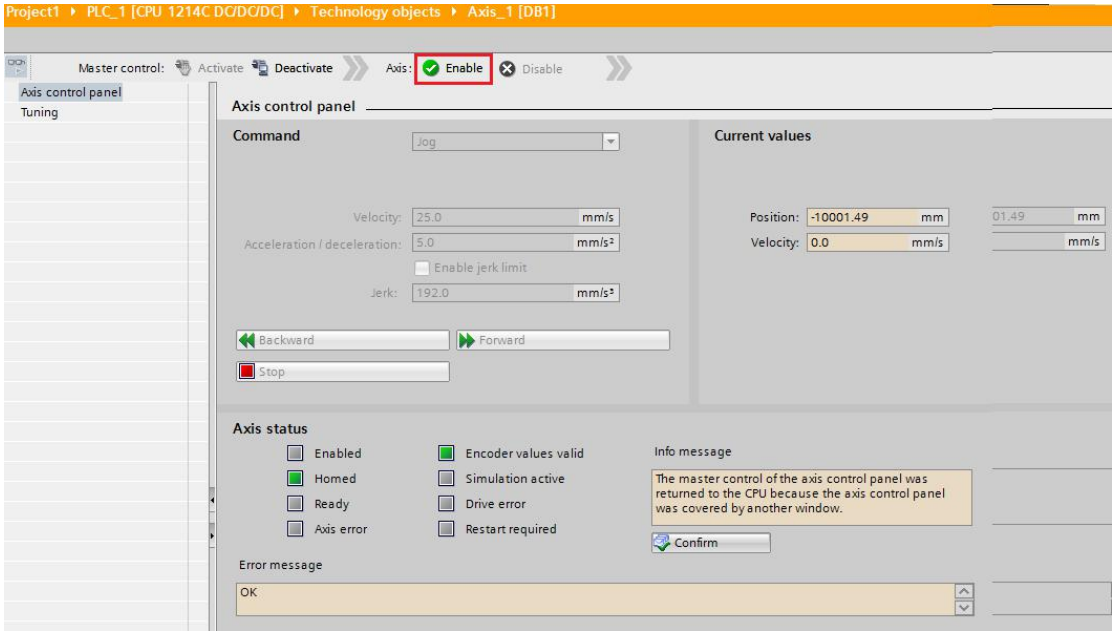
1) Open the axis control panel of the technology object Positioning axis from "Technology object > Axis_s > Commissioning" in the Project Navigator. The "Axis control panel" window opens.

2) Fetch “Master control”.

3) Click the “Activate” button.



4) Click “enable”, Click the "Forward" or "Backward" button to start a motion testing.



5. Contact us

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