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Position Control with SIMATIC S7-1200 and SINAMICS V90 PN (S mode)

SINAMICS V90 PROFINET Version

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1 Task

1.1 Overview

Introduction

In this manual the basic application “Position control with a S7-1200 and SINAMICS V90 PN” will be described in detail.

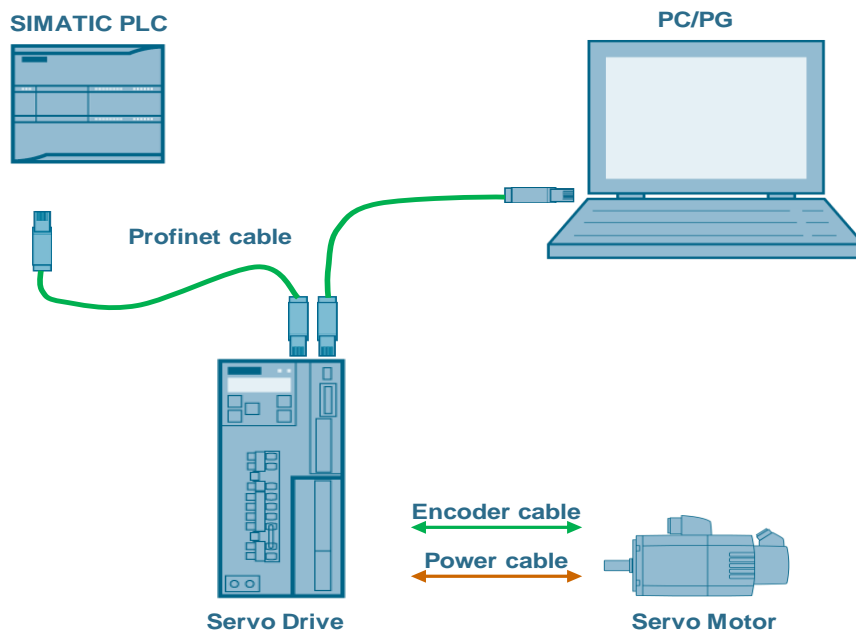
The SINAMICS V90 PN works in this application in speed control mode (S mode) and the communication will use PROFINET RT.

The described solution in this document contains the variations which have some detailed technical issues to look at it.

Overview of the automation task

The figure below provides an overview of the automation task.

Figure 1-1



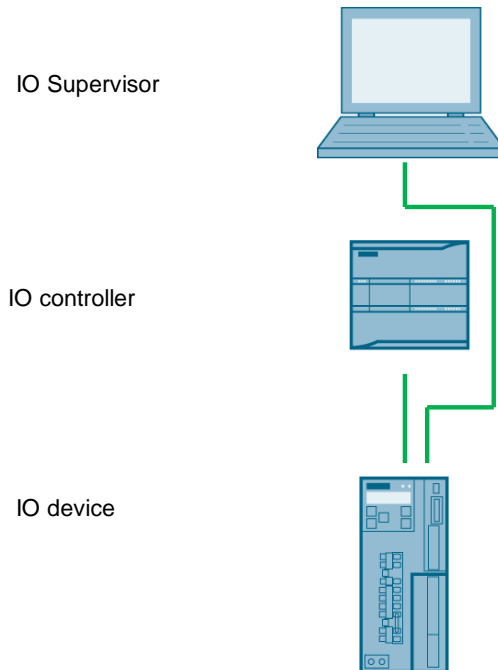
2 Solution

2.1 Solution overview

Schema Display

The following figure displays the most important components of the solution:

Figure 2-1



Delimitation

This application does not include a description of

- Profinet communication
- SINAMICS V90 PN version
- BOP operation of SINAMICS V90

Basic knowledge of these topics is assumed.

Required knowledge

Basic knowledge on TIA Portal is assumed.

2.2 Hardware and Software Components

2.2.1 Validity

This application example is valid for

- TIA Portal V15
- S7-1200 CPU with PN interface
- SINAMICS V90 PN FW V10001.0 or newer
- SIMOTICS S-1FL6 Li motor

2.2.2 Used Components

The application was generated with the following components:

Hardware components

Table 2-1

Component	No.	Article number	Note
SIMATIC S7-1200 1217C DC/DC/DC	1	6ES7217-1AG40-0XB0	V4.1
SINAMICS V90 PN 200V	1	6SL3210-5FB10-4UF0	400W
SIMOTICS S-1FL6 Li motor	1	1FL6034-2AF21-1AG1	400W

Standard software components

Table 2-2

Component	No.	Article number	Note
TIA Portal	1		V15
SINAMICS V-ASSISTANT	1		V1.04.00

Sample files and projects

The following list includes all files and projects that are used in this example.

Table 2-3

Component	Note
109743917_CPU1217C + V90 PN for Position Control_PROJ_V15.zip	Project file
109743917_Standard Application_V90pn_S7_1x00_PositionControl_DOC_en_V1.1.pdf	Reference document

3 Basics

3.1 Basics regarding SINAMICS V90 PN version

When SINAMICS V90 PN works in the speed control mode (S mode), the following telegrams are supported:

- Standard telegram 1
- Standard telegram 2
- Standard telegram 3
- Standard telegram 5
- Siemens telegram 102
- Siemens telegram 105

NOTE

Siemens telegram 105 is only available with TIA Portal V14, the Hardware Support Package for V90PN for TIA Portal and in combination with S7-1500 / 1500T.

The standard telegram 1 can be used only for RT mode. The standard telegram 2, the standard telegram 3 and the standard telegram 102 can be used either for RT mode or IRT mode depending on the IO controller. The standard telegram 5 and the standard telegram 105 can only support IRT mode and be used with TIA Portal V14 or higher.

The telegrams 1, 2 and 102 are used for speed control axis while telegrams 3, 5 and 105 are used for positioning axis because these telegrams contain the actual position of the encoder (Gn_XIST1).

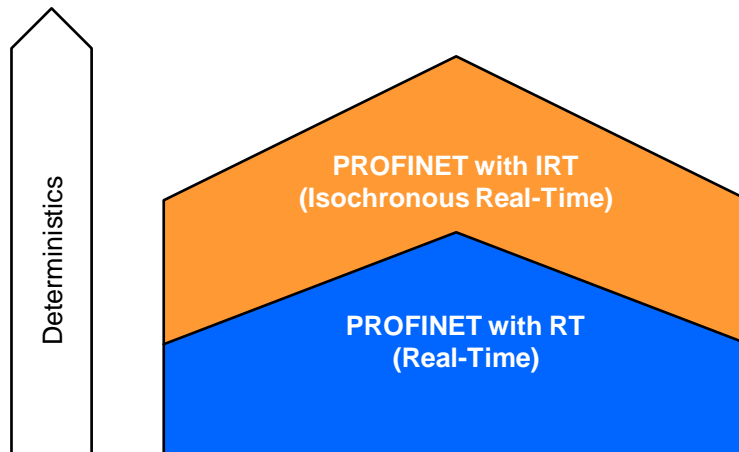
If SIMATIC S7-1200 is used for positioning control then the TO (Technology Object) Positioning axis has to be used. The TO Positioning axis only supports the standard telegrams 1, 2 and 3.

Thus, the standard telegram 3 will be used in this basic application.

3.2 Basic information about using NON-isochronous communication between PLC and drive

PROFINET IO is a scalable real-time communication system based on the Layer 2 protocol for Fast Ethernet. With the RT transmission method, two real-time-support performance levels are available for time-critical process data and IRT for high accuracy and also isochronous processes.

Figure 3-1



Real-time Communication (RT)

PROFINET IO with real-time communication (RT) is the ideal solution for integrating IO systems. This is a solution that also uses standard Ethernet in the devices and commercially available industrial switches as infrastructure components. A special hardware support is not required.

PROFINET IO frames have priority over standard frames in accordance with IEEE802.1Q. This ensures the required determinism in the automation technology. The data is transferred via prioritized Ethernet frames.

With RT, you can achieve update times $\geq 250 \mu\text{s}$ with RT.

NOTE SIMATIC S7-1200 works only with RT communication.

Isochronous Real-time Communication (IRT)

IRT is a synchronized communication protocol for cyclic exchange of IRT data between PROFINET devices. A reserved bandwidth is available in the send cycle for IRT data. The reserved bandwidth ensures that the IRT data can be transferred at reserved synchronized intervals, without being influenced by higher other network loads (such as TCP/IP communication, or additional real-time communication).

Topology configuration is a prerequisite for IRT.

In addition to the reserved bandwidth, the telegrams from defined transmission paths are exchanged for the further optimization of data transfers. For this, the topological information from the configuration is used for planning the communication. Thus, transmission and reception points of every individual data telegram at every communication node are guaranteed. This allows you to achieve

optimal usage of the bandwidth and reach the best possible performance in the PROFINET IO system.

Use of IRT allows you to achieve update times with highest deterministic $\geq 250 \mu\text{s}$ and a jitter accuracy of the send clock $< 1 \mu\text{s}$. Isochronous applications are possible with IRT.

Fields of application

Table 3-1 Fields of application for RT and IRT

RT	IRT
<ul style="list-style-type: none"> • Time-critical applications in factory automation • The implementation of large quantity structures in line process plants 	<ul style="list-style-type: none"> • Considerable deterministic with large quantity structures concerning the I/O user data communication (productive data) • Considerable performance also with many devices concerning the I/O user data communication (productive data) • Parallel transfer of productive and TCP/IP data via a cable, even with considerable data • traffic whilst ensuring the forwarding of productive data by reserving the transmission bandwidth

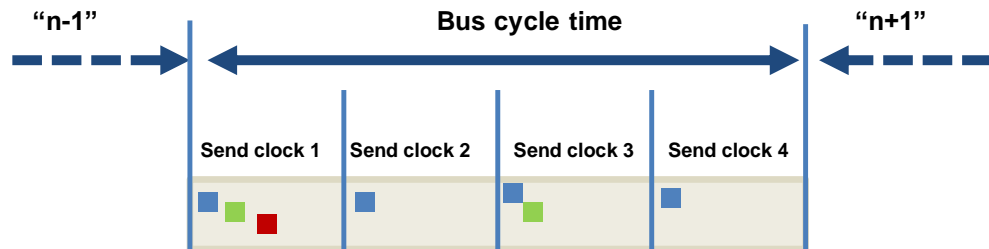
The major differences between RT and IRT

Table 3-2 Comparison between RT and IRT

Property	RT	IRT
Transmission method	Prioritizing the RT frames through Ethernet priority (VLAN tag)	Path-based switching on the basis of a communication path plan; no transmission of TCP/IP frames in the time range with IRT communication.
Determinism	Variance of the duration of transmission by the shared use of the transmission bandwidth with other protocols (e.g., TCP/IP)	Exact, planned transmission, transmission and reception times are guaranteed for all topologies.
Hardware support through special Ethernet controllers is required	Not required	Required
Isochronous application		Yes (only for the integrated PROFINET IO interface of the CPU)
Starting time of the isochronous application		The point in time for the reception of the data is planned exactly. Application can be started synchronized to the cycle.

3.3 Improvements for a better system behavior

Figure 3-2 Communication cycle



Send clock

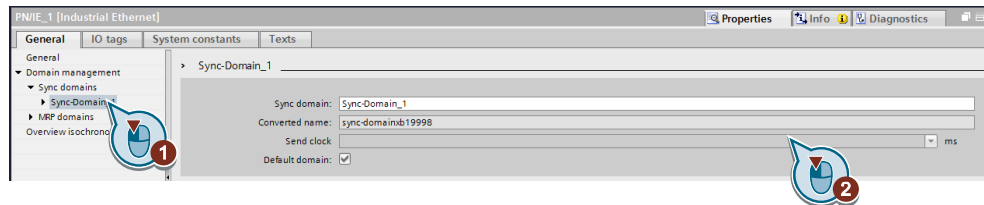
Send clock is the shortest possible time interval in data exchange.

The calculation of send clock should follow the formula below:

$$\text{Send clock} = 31.25 \mu\text{s} * \text{Send Clock Factor}$$

The send clock factor is $2n$ (n is an integral value from 0 to 9), while $31.25 \mu\text{s}$ is the basic time unit.

Figure 3-3 Send clock in TIA Portal (follow step 1 to 2 to do the change of send clock)



NOTE The send clock is unable to be changed for RT communication.

Update time (Bus cycle time)

The update time is a time interval. IO controller and IO device/I-device exchange IO data cyclically in the IO system within this time interval. The update time can be configured separately for each IO device and determines the interval at which output data is sent from the IO controller to the IO device (output module/submodule) as well as input data from the IO device to the IO controller (input module/submodule).

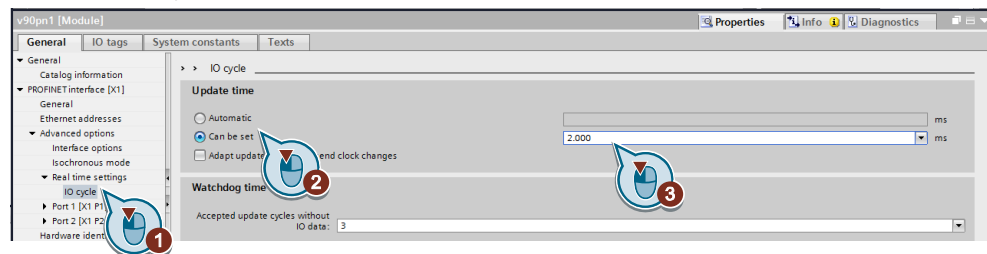
STEP 7 calculates the update time automatically in the default setting for each IO device of the PROFINET IO system, taking into account the volume of data to be exchanged as well as the set send clock.

The calculation of update time should follow the formula below:

$$Update\ time = 31.25\ \mu s * Send\ Clock\ Factor * 2^n = Send\ clock * 2^n$$

2^n : reduction (an integral value ≤ 16), n : reduction ratio

Figure 3-4 update time (bus cycle time) in TIA Portal (follow step 1 to 3 to change the bus cycle time)

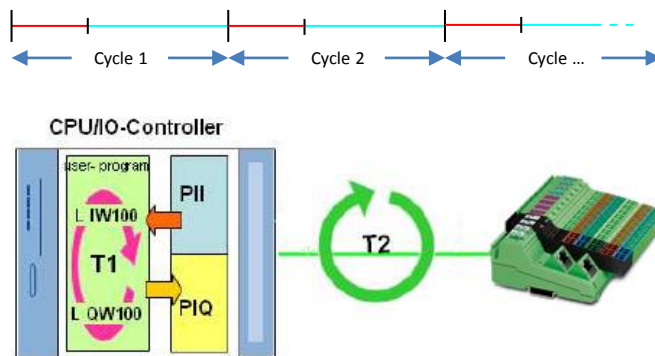


Cycle time for PLC program

Cycle time of PLC program is also calculated automatically within STEP 7. It can be changed according to actual application.

The relationship between cycle time for PLC program and bus cycle time as well as send clock (cycle n) is shown as follows:

Figure 3-5 Cycle communication



T1: cycle time for PLC program **T2:** Bus cycle time

3.4 Recommendation of time setting with SIMATIC S7-1200

NOTICE	Mechanical disturbance caused by unfavorable cycle times! Unexpected mechanical disturbances can be caused by current and torque disturbances.
---------------	--

NOTE	When SINAMICS V90 PN works in RT communication, the minimum cycle time is unchangeable and fixed to be 4 ms.
-------------	--

When SIMATIC S7-1200 is connected to SINAMICS V90 PN for positioning control, OB91 (MC-Servo) must be used. The cycle time for OB91 can be changed according to actual application requirements.

Usually, the following rules during the configuration of OB91 cycle time and bus cycle time must be observed:

- The ratio between OB91 cycle time and Bus cycle time or vice versa must be an even integral value
- The CPU capability must be considered

Following selections of bus cycle time are recommended according to our test:

Table 3-3 Recommended Bus cycle time (in ms) for SIMATIC S7-1200

OB91 cycle time	Bus cycle time (IO cycle)	Min. cycle time in V90 PN
2	1	4
4	1	4
8	1	4
12	1	4
16	1	4
2	2	4
4	2	4
8	2	4
12	2	4
16	2	4
2	4	4
4	4	4
8	4	4
16	4	4

3 Basics

Figure 3-6 Example 1 of torque/speed (OB91 cycle time = 8 ms; bus cycle time = 4 ms)

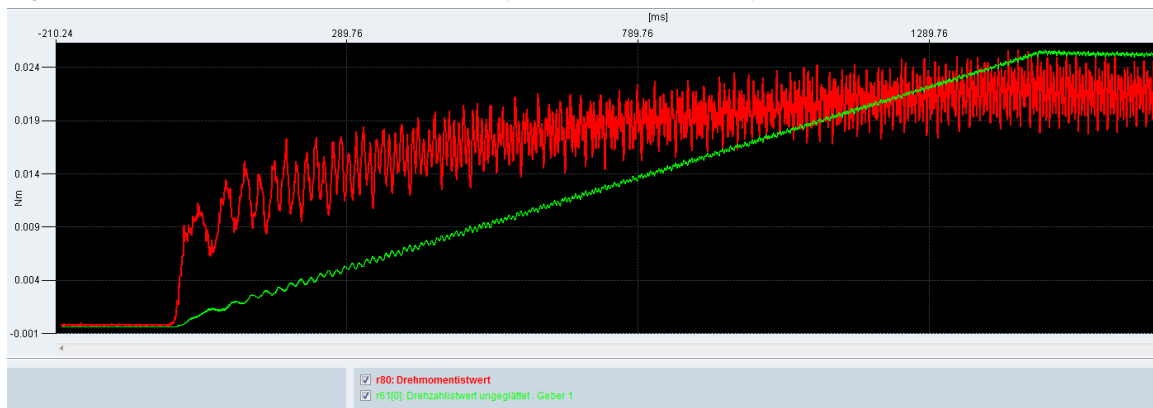


Figure 3-7 Example 2 of torque/speed (OB91 cycle time = 10 ms; bus cycle time = 4 ms)



3.5 Recommendation of time setting SIMATIC S7-1500

When SIMATIC S7-1500 is connected to SINAMICS V90 PN for positioning control, you can select between RT communication and IRT communication.

NOTE In standard applications with S7-1500(T) and V90 PN the IRT communication is recommended. If there is a necessary case to setup PROFINET RT then the following description can be used.

When the RT communication has been selected, the cycle time for OB91 is changeable and can be adjusted according to actual application.

NOTICE **Mechanical disturbance caused by unfavorable cycle times!**
Unexpected mechanical disturbances can be caused by current and torque disturbances.

Usually, the following rules during the configuration of OB91 cycle time and bus cycle time must be observed:

- The ratio between OB91 cycle time and Bus cycle time or vice versa must be an even integral value
- The CPU capability must be considered

Following selections of time configurations are recommended according to our test:

Table 3-4 Recommended time configurations (in ms) for SIMATIC S7-1500

OB91 cycle time	Bus cycle time (IO cycle)	Min. cycle time in V90 PN
2	1	4
4	1	4
8	1	4
12	1	4
16	1	4
2	2	4
4	2	4
8	2	4
12	2	4
16	2	4
2	4	4
4	4	4
8	4	4
12	4	4
16	4	4
2	8	4
4	8	4
8	8	4
16	8	4

3 Basics

Figure 3-8 Example 1 of torque/speed (OB91 cycle time = 4 ms; bus cycle time = 2 ms)

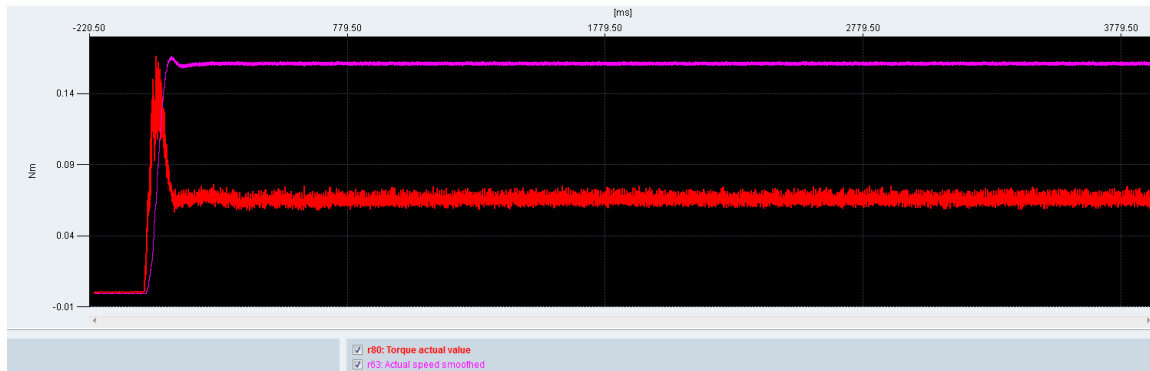
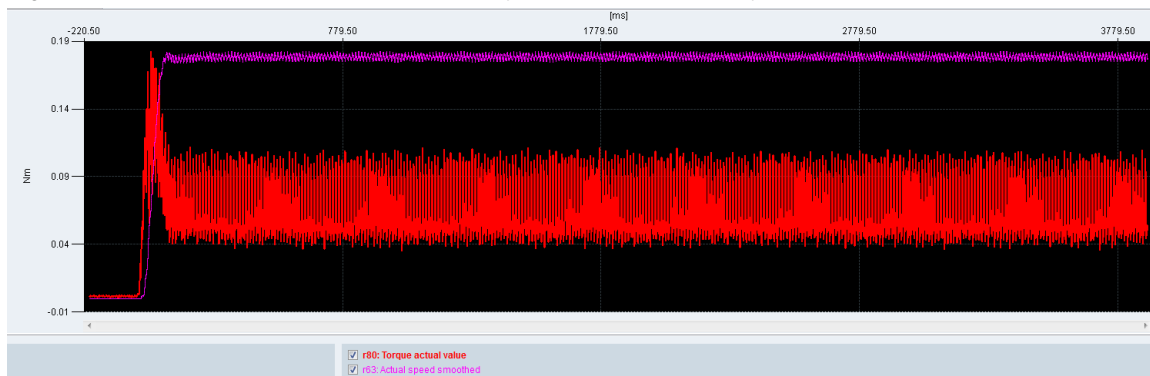


Figure 3-9 Example 2 of torque/speed (OB91 cycle time = 4 ms; bus cycle time = 3 ms)



NOTICE

Mechanical disturbance caused by unfavorable cycle times!

Unexpected mechanical disturbances can be caused by current and torque disturbances.

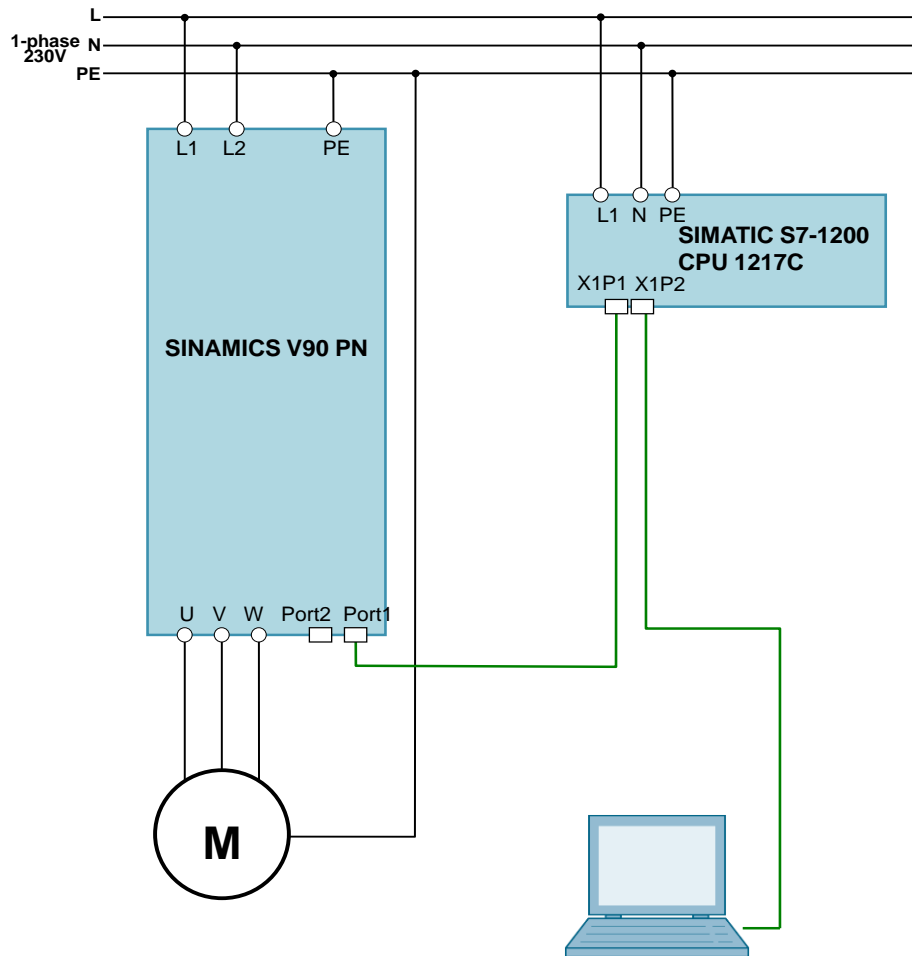
3.6 Installation and startup

3.6.1 Hardware installation

The figure below shows the hardware configuration of the application:

CAUTION	Wrong wiring can damage the drive! In this application, the one phase 230V power supply is used. It is a must for you to check the supply voltage; otherwise, the drive can be damaged!
----------------	---

Figure 3-1



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3.6.2 Startup (JOG from drive side)

Table 3-1

Nr.	Action	Remarks
1.	Set drive parameter p29108 to be 1.	JOG function is enabled when p29108=1
2.	Switch to JOG menu with drive BOP operation.	
3.	Press ▲ or ▼ button to run the motor.	
4.		

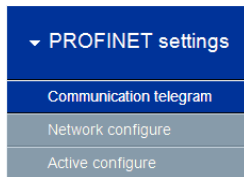
4 Configuration

In this chapter the configurations for position control with RT mode will be described in detail. The used standard telegram is “3”.

4.1 Basic parameter configuration regarding SINAMICS V90 PN

4.1.1 Configure PROFINET settings via SINAMICS V-ASSISTANT

The following parameters can be configured with the SINAMICS V-ASSISTANT from the PROFINET settings menu field:



In this menu filed, you can configure:

- **Communication telegram:** in this tab you can also check the PZD structure and values:

Speed control mode

Telegram selection

The current telegram: 3 : Standard telegram 3, PZD-5/9

The PZD fields structure of current telegram and values of PZD fields are shown in below tables .

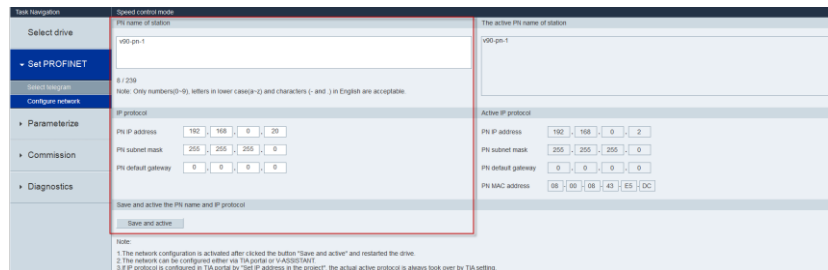
PZD structure and values

Receptive direction (PZD count=5): STW1 (PZD1)

Transmit direction (PZD count=9): ZSW1 (PZD1)

Telegram	Description	Value	Telegram	Description	Value
STW1	Control word 1	400H	ZSW1	Status word 1	60224
bit0	rising edge = ON (pulses can be enabled)...	0	bit0	1 = Ready for switching on	0
bit1	1 = No OFF2 (enable is possible); 0 = OF...	0	bit1	1 = Ready for operation	0
bit2	1 = No OFF3 (enable possible); 0 = OFF3 ...	0	bit2	1 = Operation enabled	0
bit3	1 = Enable operation (pulses can be enabl...	0	bit3	1 = Fault present	0
bit4	1 = Operating condition (the ramp-function...	0	bit4	1 = No coast down active (OFF2 inactive)	0
bit5	1 = Continue ramp-function generator; 0 =...	0	bit5	1 = No fast stop active (OFF3 inactive)	0
bit6	1 = Enable setpoint; 0 = Inhibit setpoint (s...	0	bit6	1 = Switching on inhibited active	1
bit7	rising edge= 1. Acknowledge faults	0	bit7	1 = Alarm present	0
bit8	Reserved	0	bit8	1 = Speed setpoint - actual value deviatio...	1
bit9	Reserved	0	bit9	1 = Control requested	1
bit10	1 = Control via PLC	1	bit10	1 = f or n comparison value reached/exce...	0
bit11	1 = Setpoint inversion	0	bit11	1 = I, M, or P limit reached	1
bit12	1 = Unconditionally open the holding brake	0	bit12	1 = Open the holding brake	0
bit13	1 = Motorized potentiometer setpoint raise	0	bit13	1 = No motor overtemperature alarm	1
bit14	1 = Motorized potentiometer setpoint lower	0	bit14	1 = Motor rotates forwards (n_act >= 0); 0 ...	1
bit15	Reserved	0	bit15	1 = No alarm, thermal overload, power unit	1

- **Network:**



Note: the configurations must be saved for activation.

- **Active configure:** The active PROFINET settings can be checked from the tab.

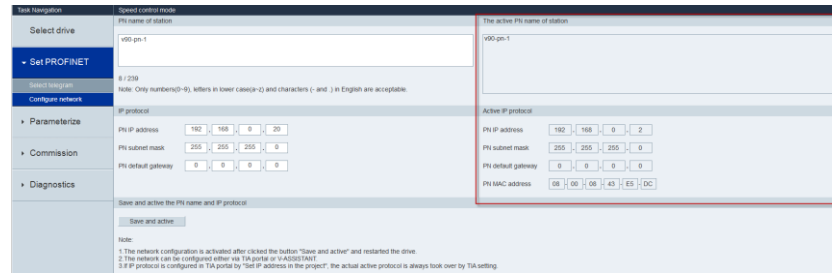


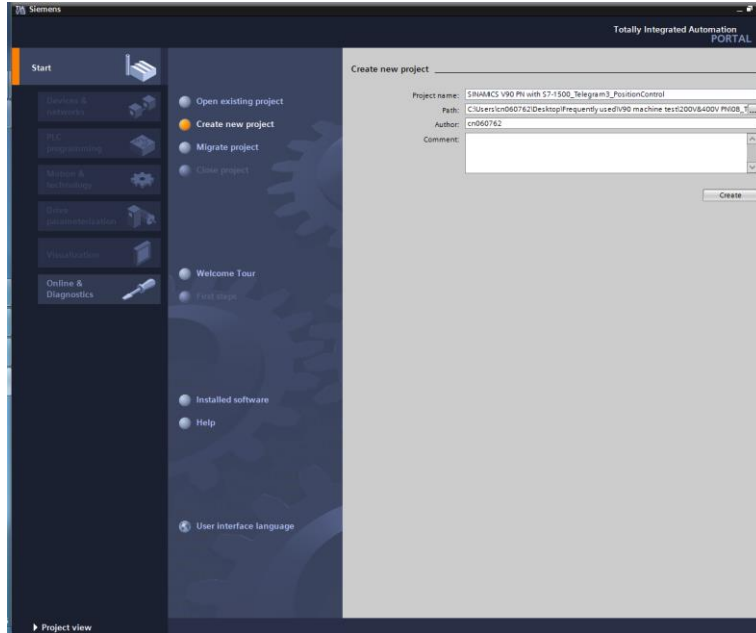
Table 3-1: PROFINET relevant parameters

Par. No.	Description	Set value
P922	Telegram selection	3
P8921	PN IP address. There are four indexes. Each index maps to a segment of the IP address. Note: after successful configuration, the values will be changed to 0 automatically.	Example IP address: 192.168.0.2 P8921[0]=192 P8921[1]=168 P8921[2]=0 P8921[3]=2
P8923	PN Subnet Mask of Station. There are four indexes. Each index maps to a segment of the subnet mask. Note: after successful configuration, the values will be changed to 0 automatically.	Example Subnet mask: 255.255.255.0 P8923[0]=255 P8923[1]=255 P8923[2]=255 P8923[3]=0
P8925	PN interface configuration Note: after successful configuration, the values will be changed to 0 automatically.	2 Note: after setting p8921 and p8923, p8925 should be set to be 2 for activating the PN communication.
r8931	PN IP address of station active	
r8932	PN default gateway of station active	
r8933	PN MAC address of station	

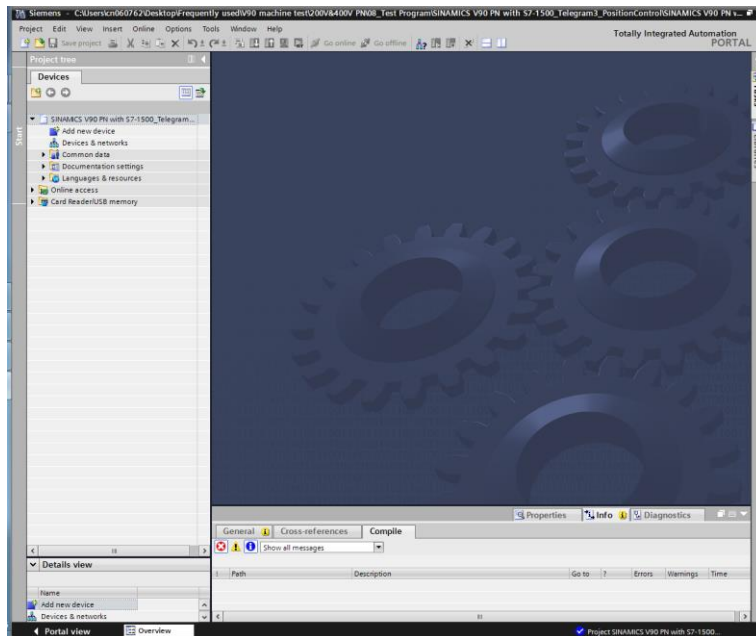
4.1.2 Configure PROFINET settings via the TIA Portal

4.1.2.1 Create a new project

1. Open the TIA Portal and create a new project:



2. Switch to "Project view":

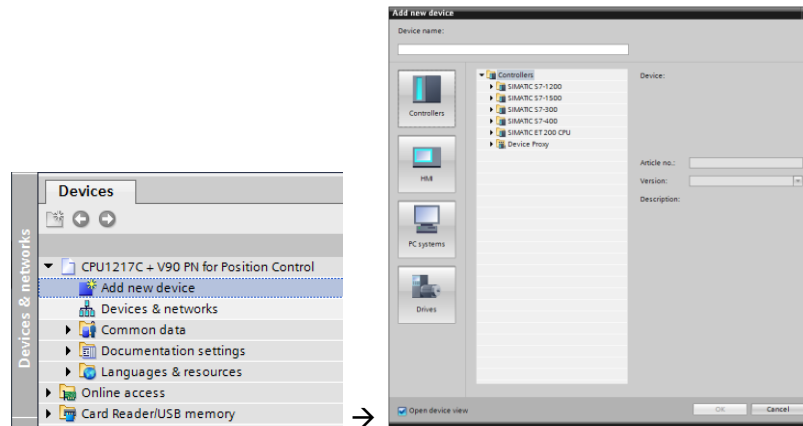


4 Configuration

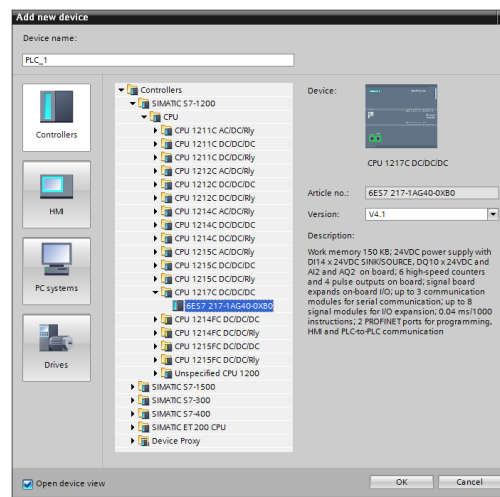
4.1.2.2 Add S7-1200 CPU into the project

Add S7-1200 CPU into the project as follows:

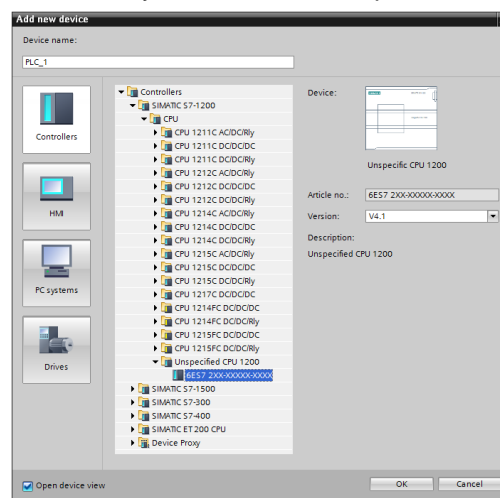
1. Double-click the node **"Add new device"** from the Device tree:



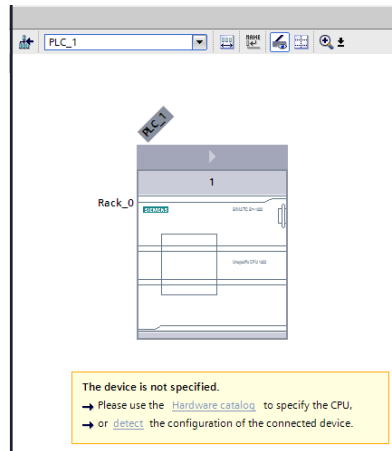
2. Here, if you know the detailed information about the S7-1200 modules, you can directly find the type and add it into the project



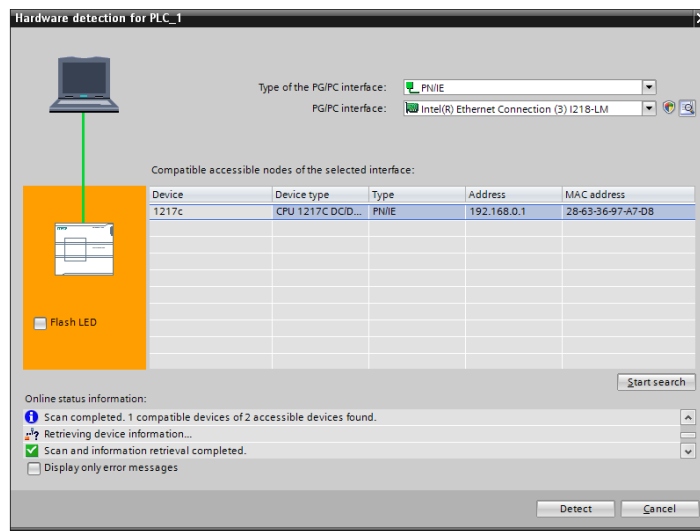
Otherwise, you can add an unspecified CPU 1200 into the project:



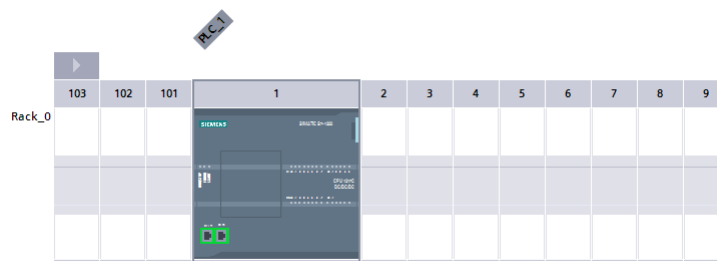
- If an unspecified 1200 CPU has been added into the project, you can detect the connected CPU by clicking the **“Detect”** and search it with online access:



Start the search by clicking the **“Start search”** button, and the connected S7-1200 CPU will be found if the PROFINET network communication works properly:



- Press **“Detect”** button to detect the connected CPU:



4 Configuration

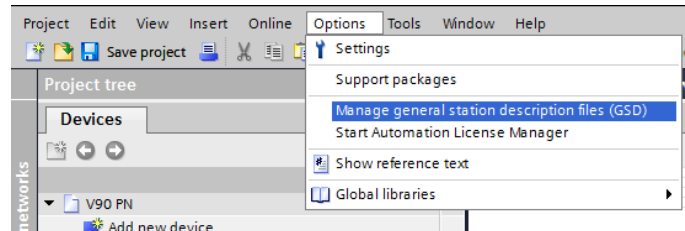
4.1.2.3 Add SINAMICS V90 PN into the project

Add SINAMICS V90 PN into the project in the TIA Portal as follows:

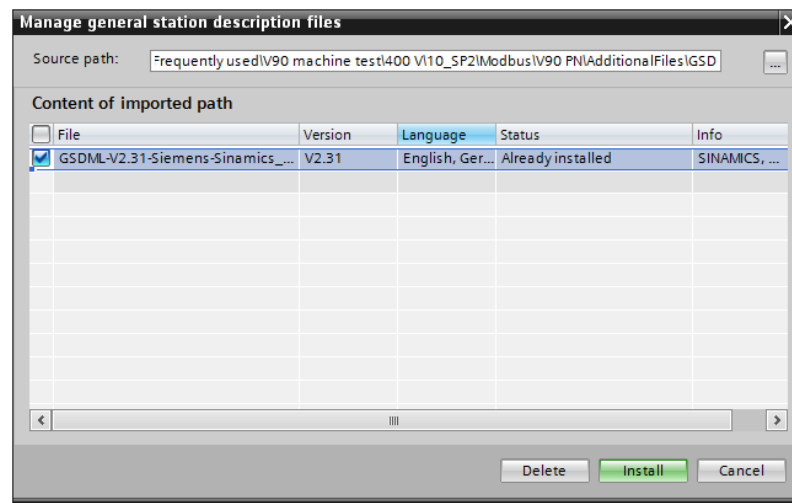
1. Input the V90 PN GSD file.

NOTE For the GSD file, you can download from following internet site:

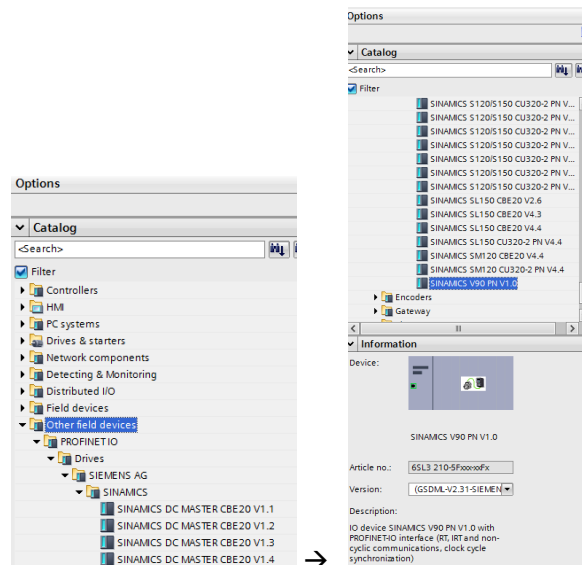
<https://support.industry.siemens.com/cs/ww/en/view/109737269>



2. Find the GSD file and select it. Press the "Install" button to install it.



3. In the network view, select V90 PN from the "other filed drives" of catalog tree on the right side.



4. Double-click the V90 PN node or drag it to the network view:

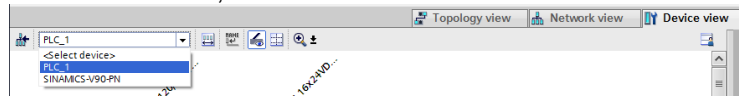


4 Configuration

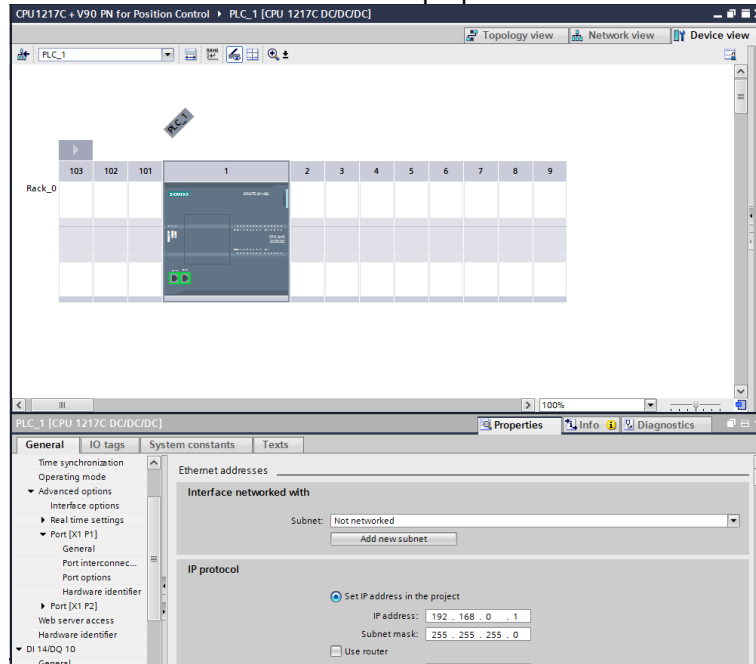
4.1.2.4 Device configuration for S7-1200 CPU

Make device configurations for S7-1200 CPU as follows:

1. In the device view, select the PLC:



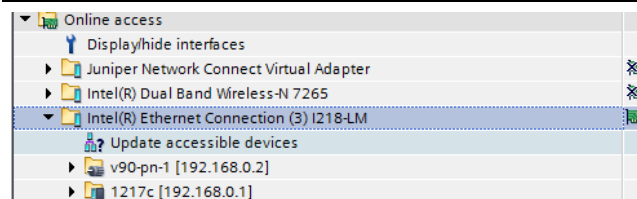
2. Double-click the PLC CPU to enter properties of the CPU:



Here, you can configure information about the device name, Ethernet address...

You can also use the “**Online access**” to find the accessible device and make sure the information is consistent:

NOTE Important!
The Profinet name is very important. You must double-check such information in the SINAMICS V90 PN configuration.

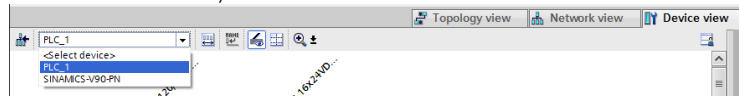


4 Configuration

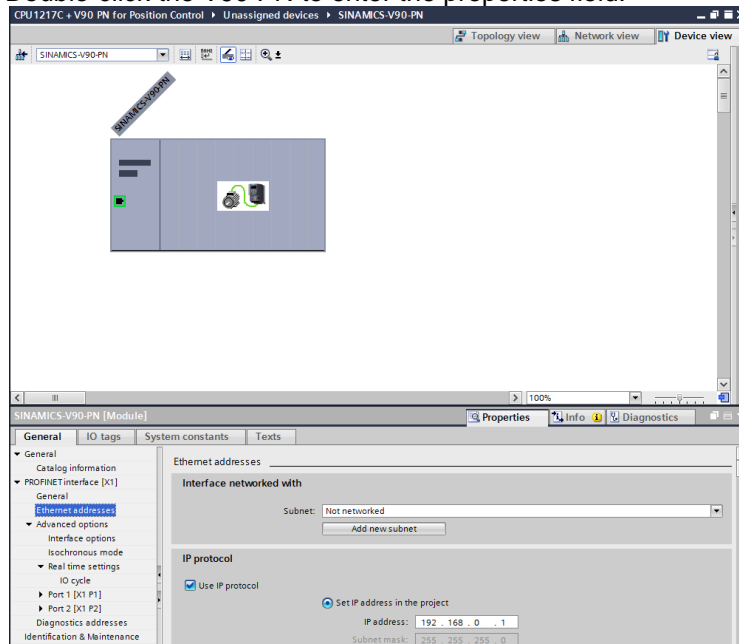
4.1.2.5 Device configuration for SINAMICS V90 PN

Make device configurations for SINAMICS V90 PN as follows:

1. In the device view, select the SINAMICS V90 PN:



2. Double-click the V90 PN to enter the properties field:

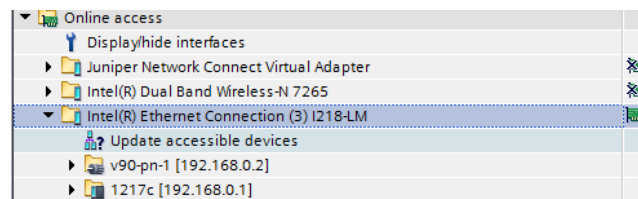


Here, you can configure information about the device name, Ethernet address...

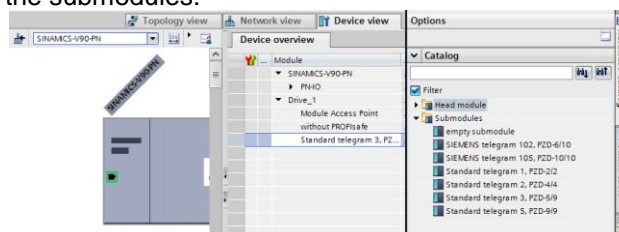
You can also use the “**Online access**” to find the accessible device and make sure the information is consistent:

NOTE Important!

The Profinet name is very important. You must double-check such information in the SINAMICS V90 PN configuration.



3. In the device view of SINAMICS V90 PN, select the standard telegram 3 from the submodules:

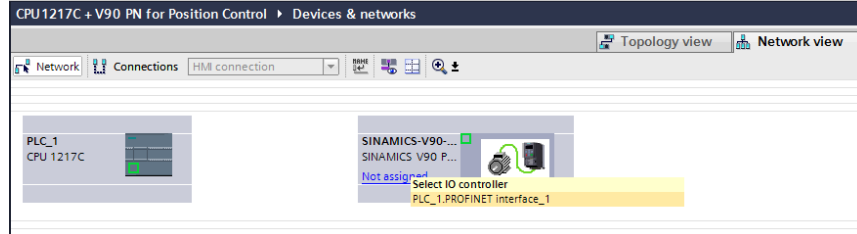


4 Configuration

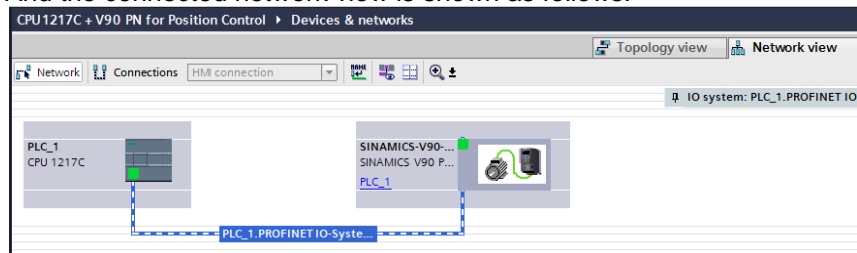
4.1.2.6 Connect SINAMICS V90 PN with S7-1200 CPU

After the configurations of both SINAMICS V90 PN and S7-1200 CPU, you need to connect SINAMICS V90 PN to S7-1200 CPU:

1. In the network view, click the **“Not assign”** and select **“PLC_1.PROFINET Interface_1”**:



2. And the connected network view is shown as follows:

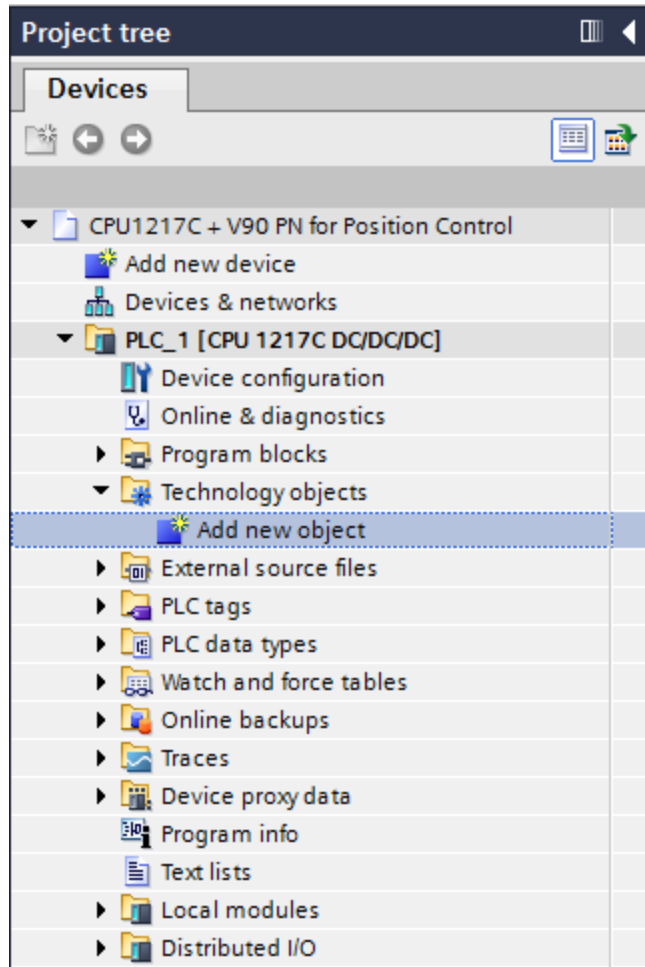


5 Operation of the application

In the following paragraph, we will use TO (Technology Object) of positioning axis for programming and run the motor:

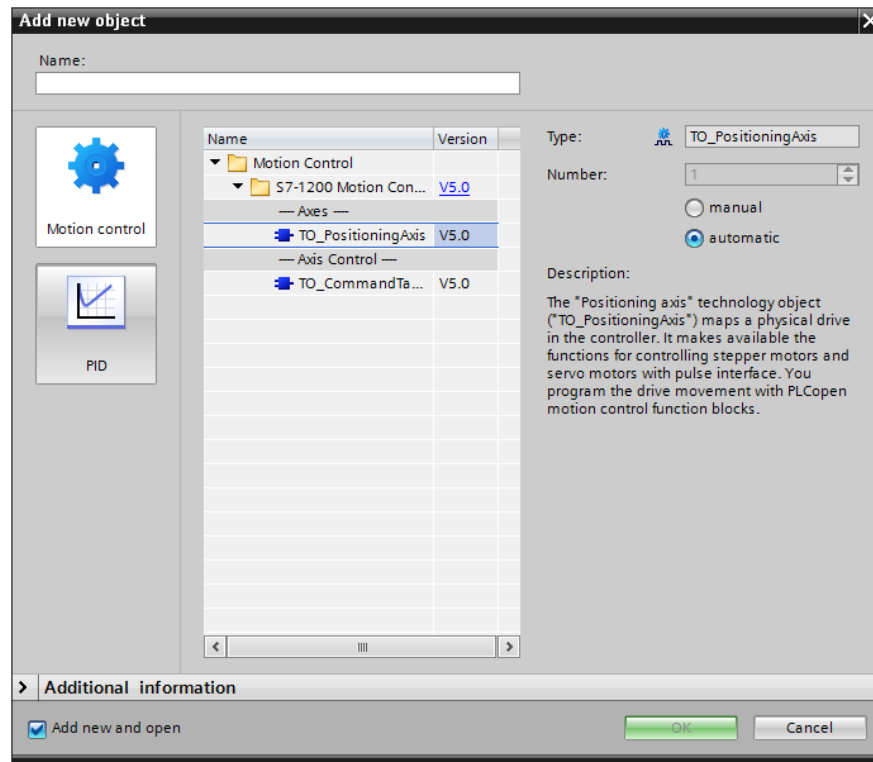
1. Add a new object by double-click “Add new object” from the project tree:

Figure 5-1



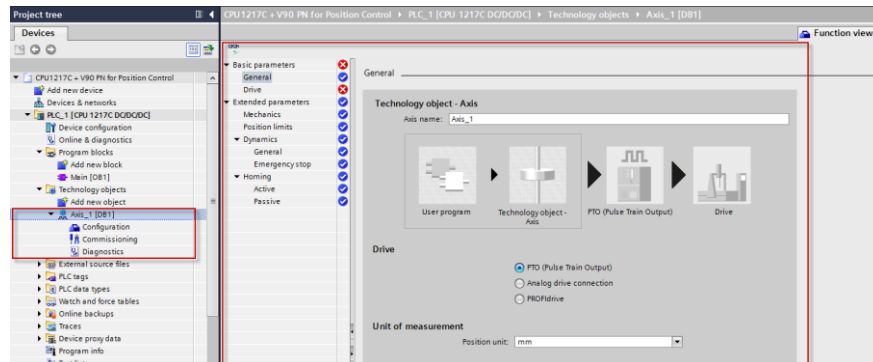
2. Select the "TO_PositioningAxis" from the "Motion Control" list:

Figure 5-2



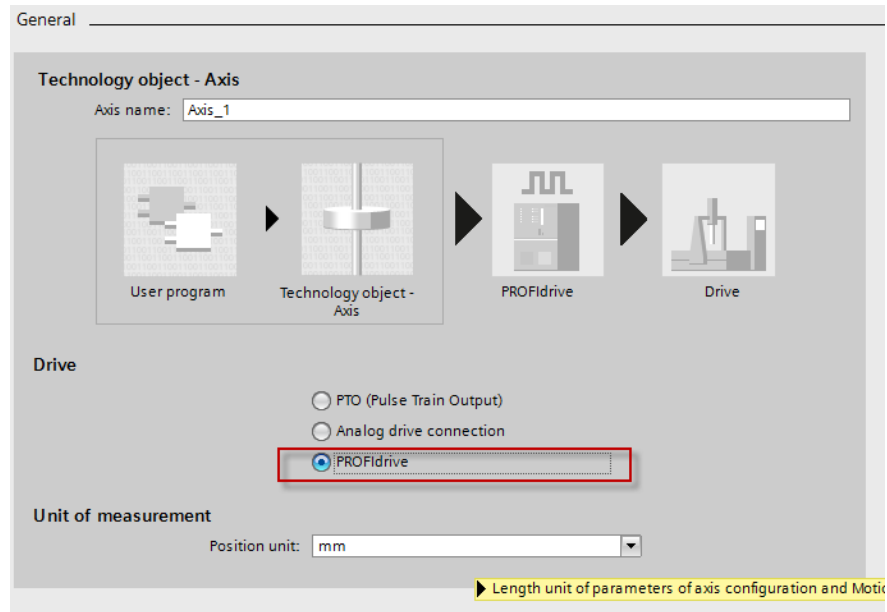
3. When a new object has been added successfully, the object node is added into the device tree and the configuration panel for this newly added axis is opened:

Figure 5-3



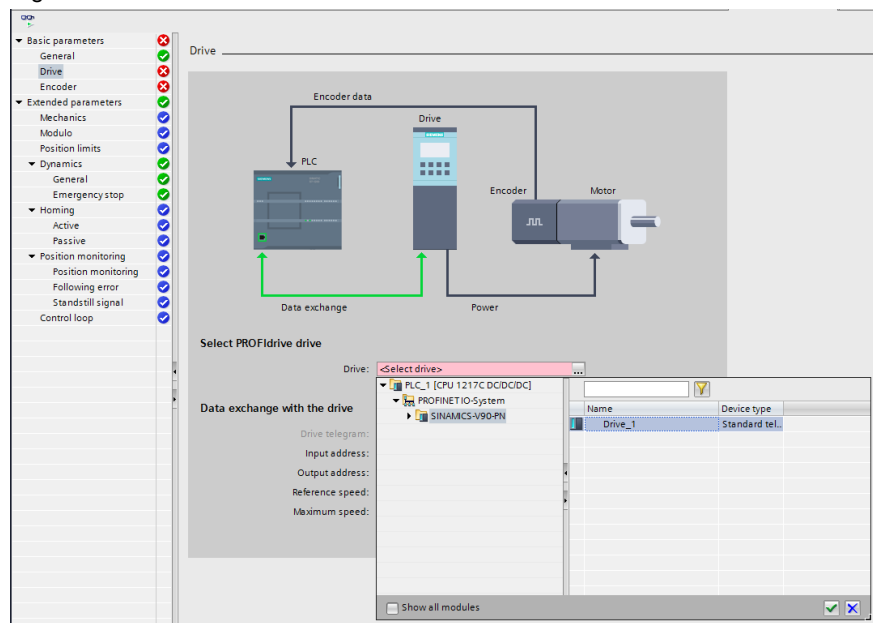
4. Make configurations step by step.
In this example, we firstly need to configure the type of drive to be **“PROFdrive”** under general information of basic parameters:

Figure 5-4



5. After configuring the type of drive, we need to select a PROFdrive in the drive information of basic parameters:

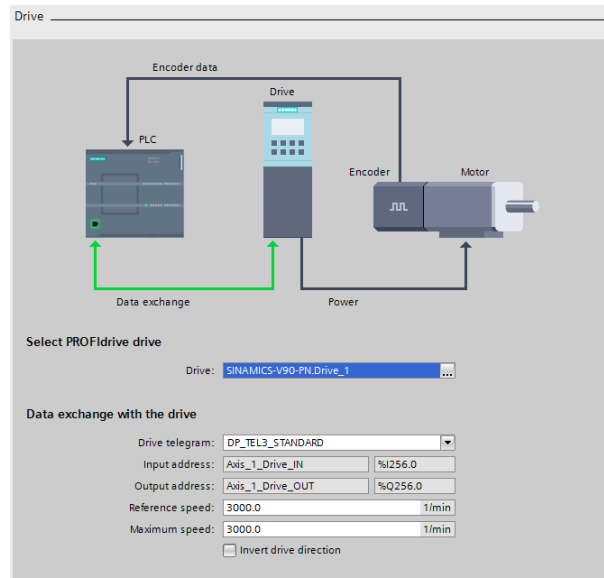
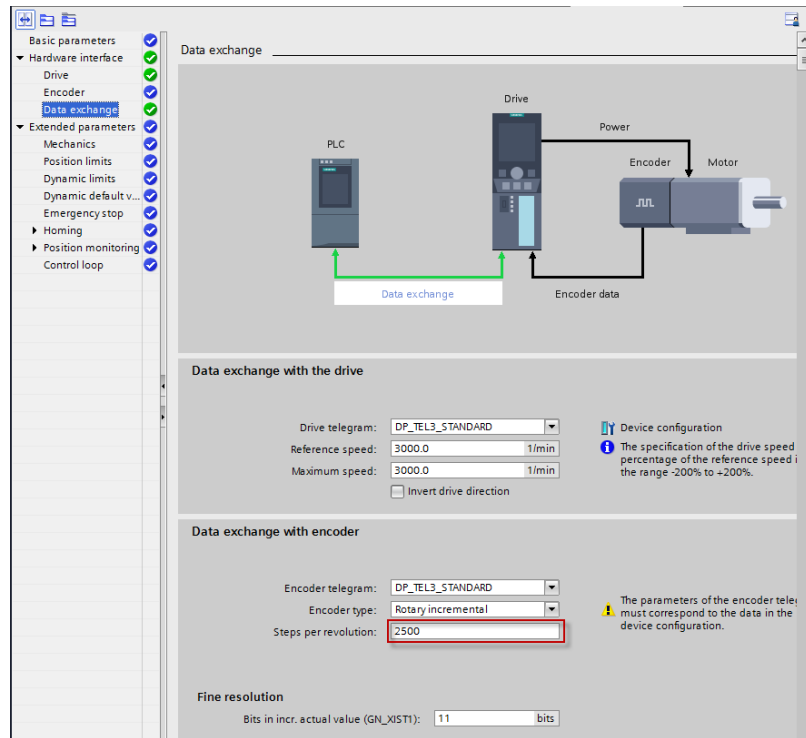
Figure 5-5



5 Operation of the application

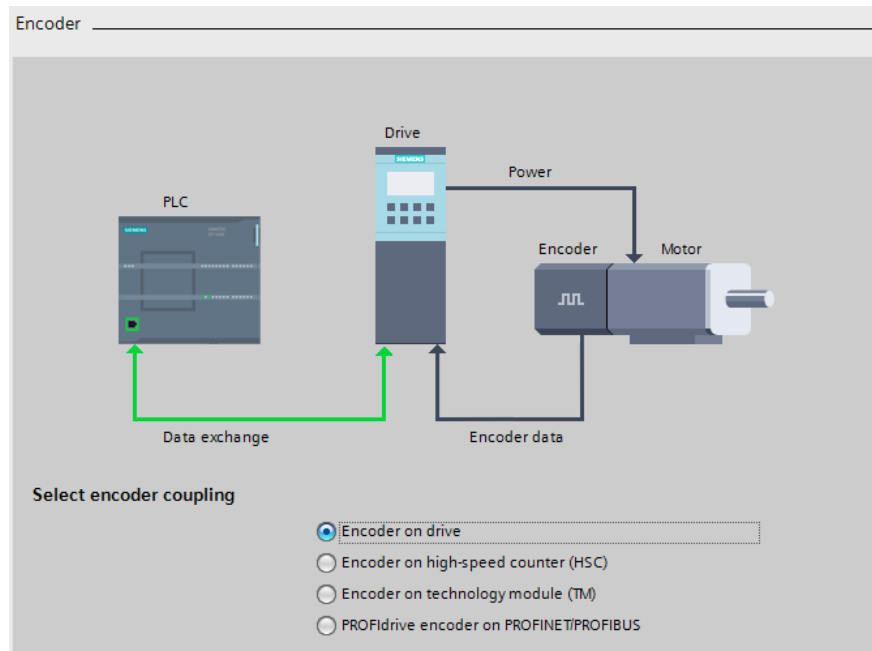
- After that, change the steps per revolution to 2500 because an incremental encoder with the resolution of 2500 ppr is used in our example:

Figure 5-6



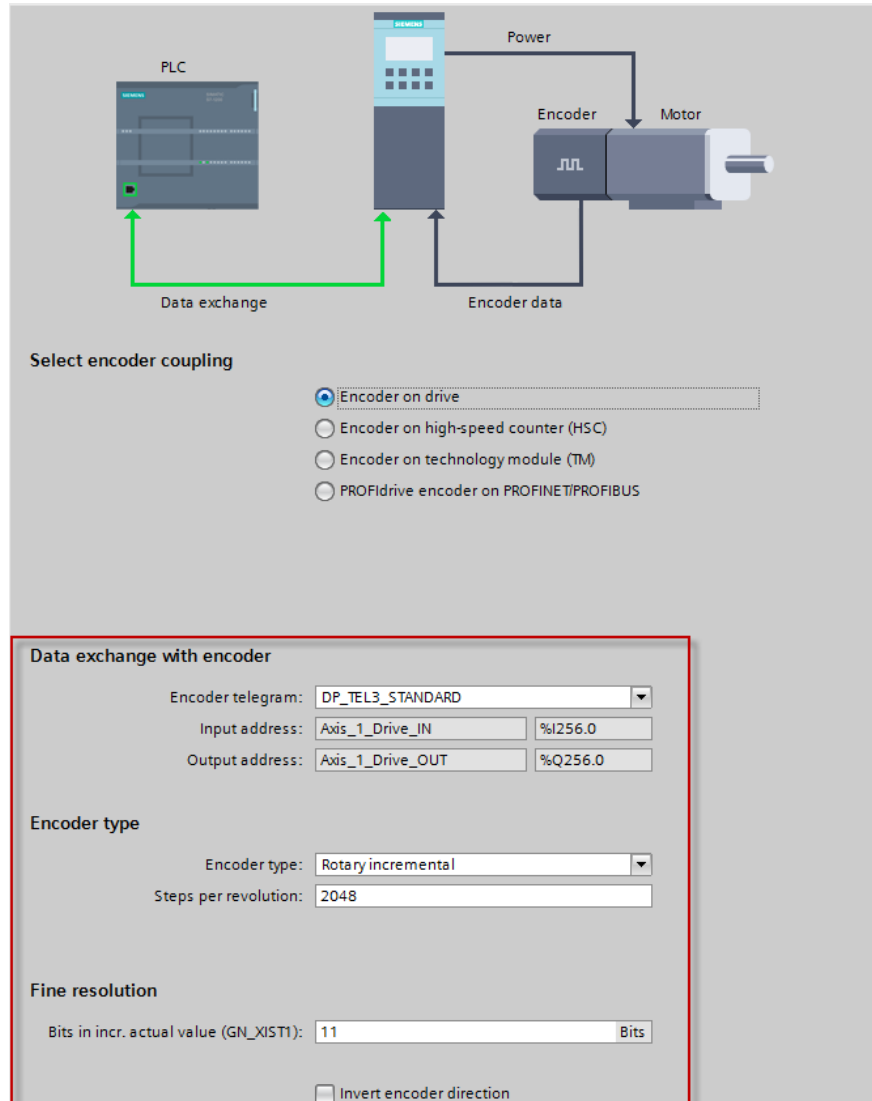
7. Select encoder coupling under the encoder information of the basic parameters. In this example, it should be “Encoder on drive”:

Figure 5-7

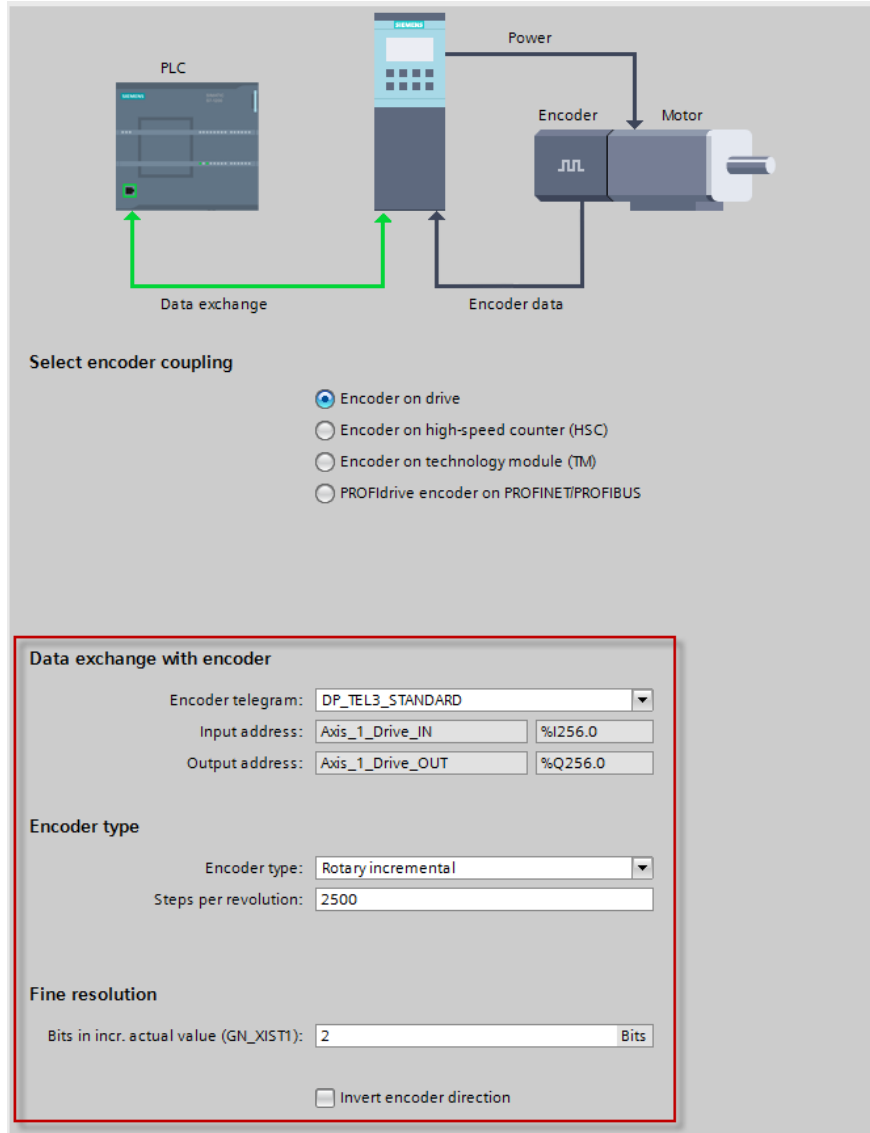


8. After selecting “Encoder on drive”, the information about the data exchange and encoder type is displayed and needs to be configured:

Figure 5-8



9. In this example, we use standard telegram 3 for data exchanging and an incremental encoder with the resolution of 2500 ppr (fine resolution: 2 bits):
Figure 5-9



10. Compile the project and then download it into device.

Figure 5-10

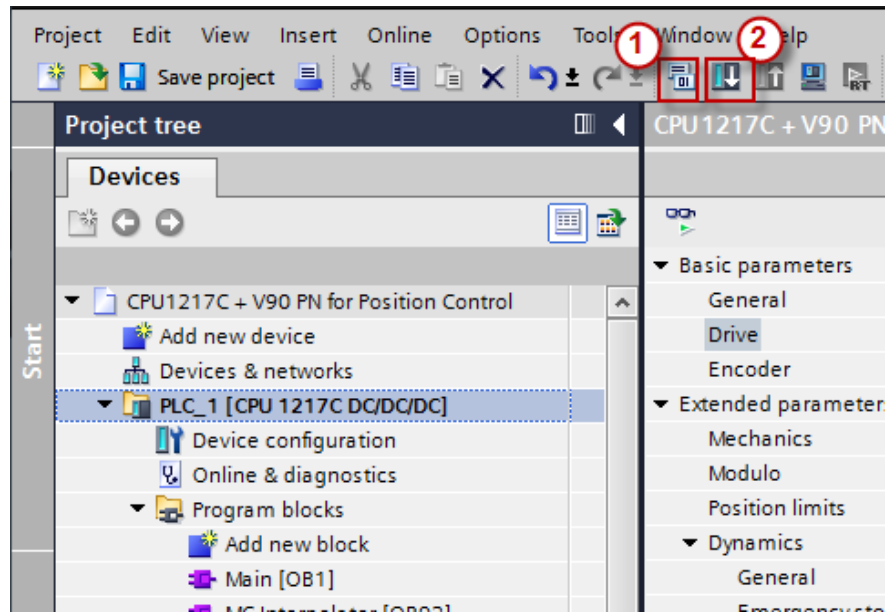


Figure 5-11

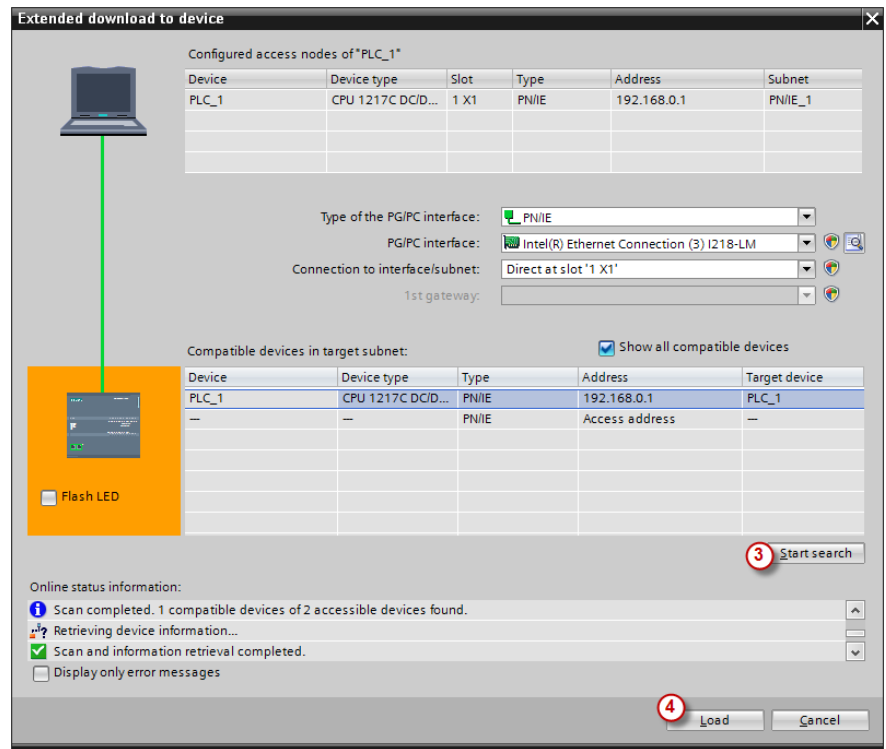


Figure 5-12

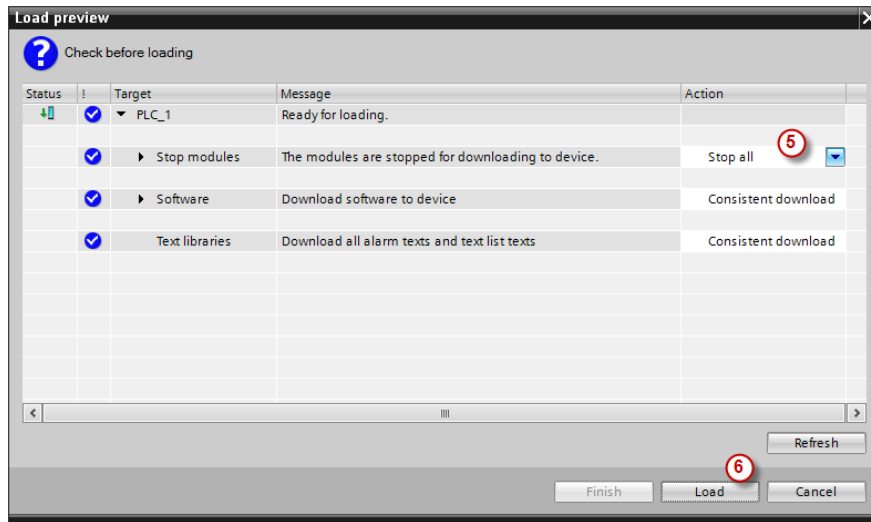
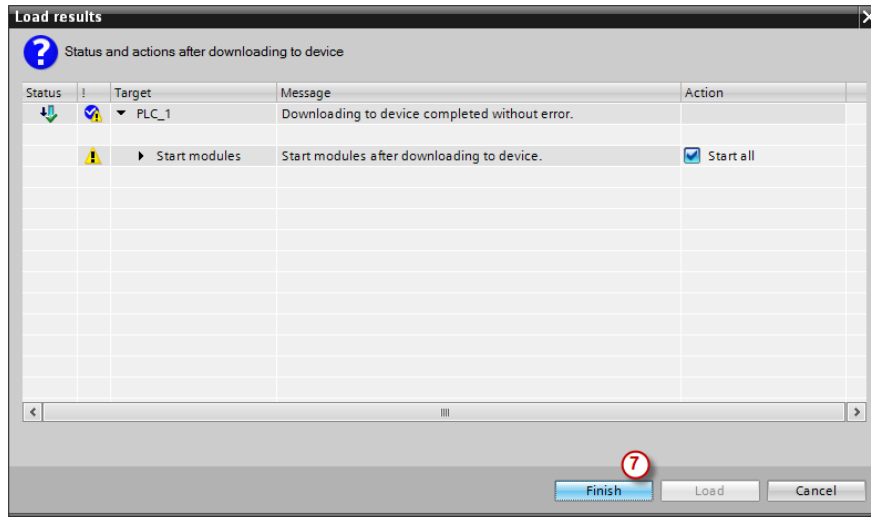
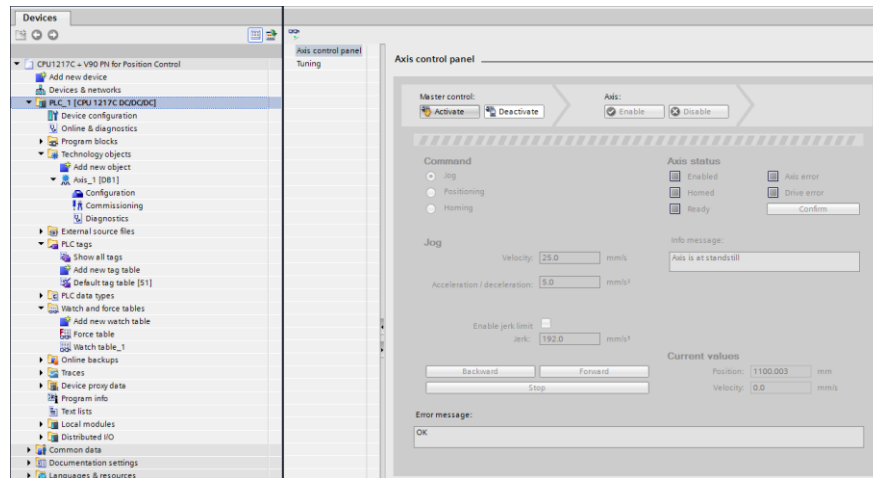


Figure 5-13



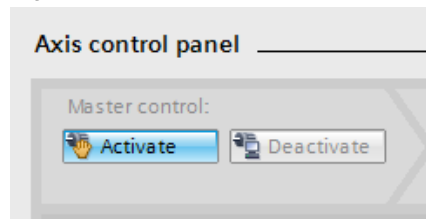
- Switch to the commissioning panel by double-clicking the “Commissioning” under the technology object tree:

Figure 5-14



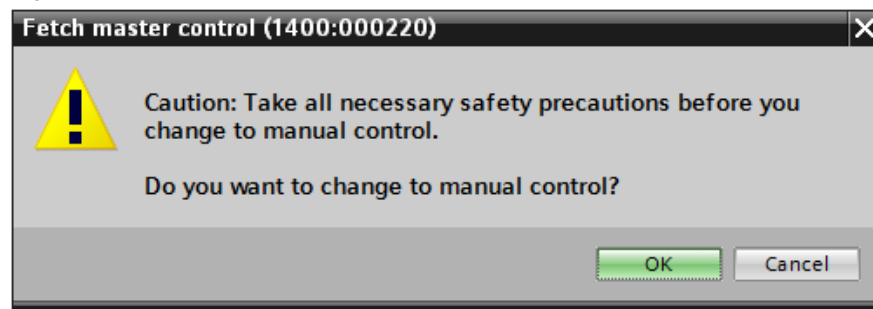
- Click the “**Activate**” button:

Figure 5-15



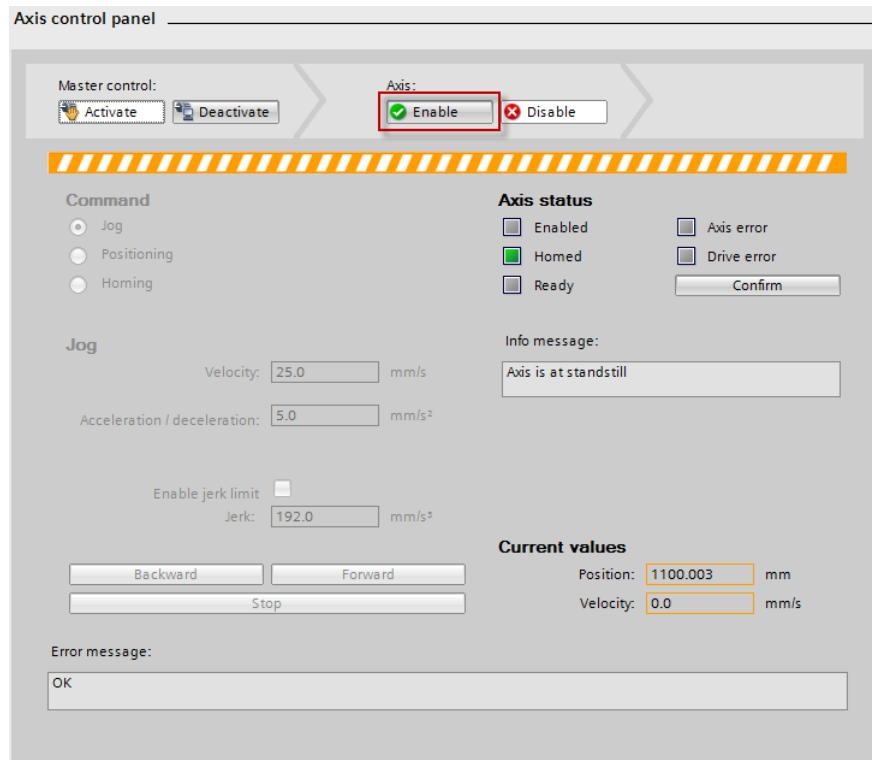
- In the pop-up dialog box, click “**OK**” button to proceed the operation.

Figure 5-16



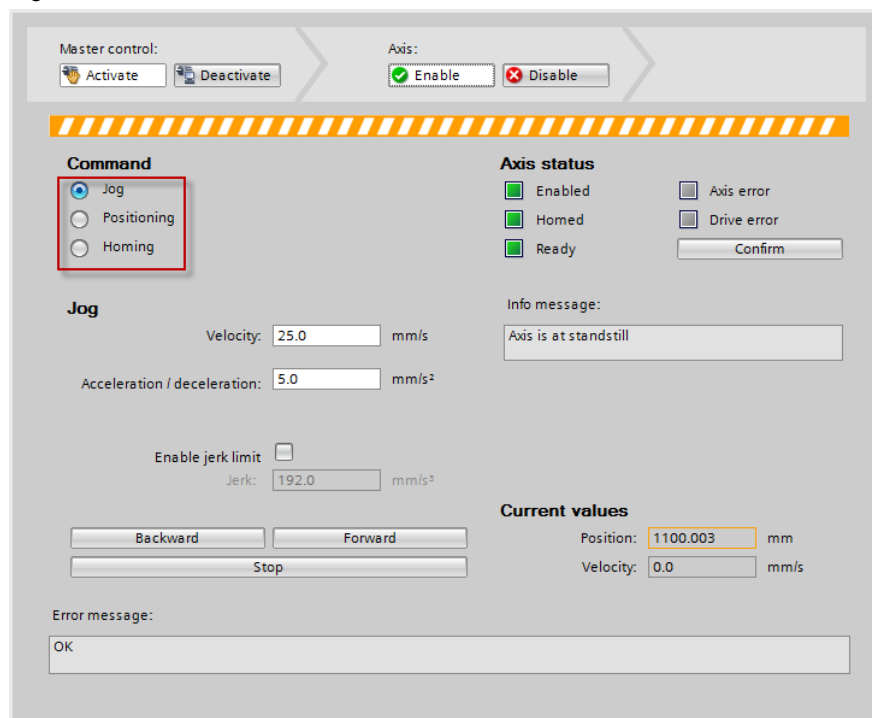
14. Click the “Enable” button to make servo drive at SON (servo is on) state:

Figure 5-17



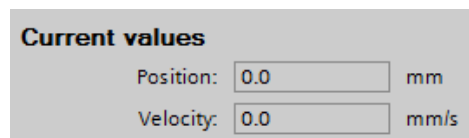
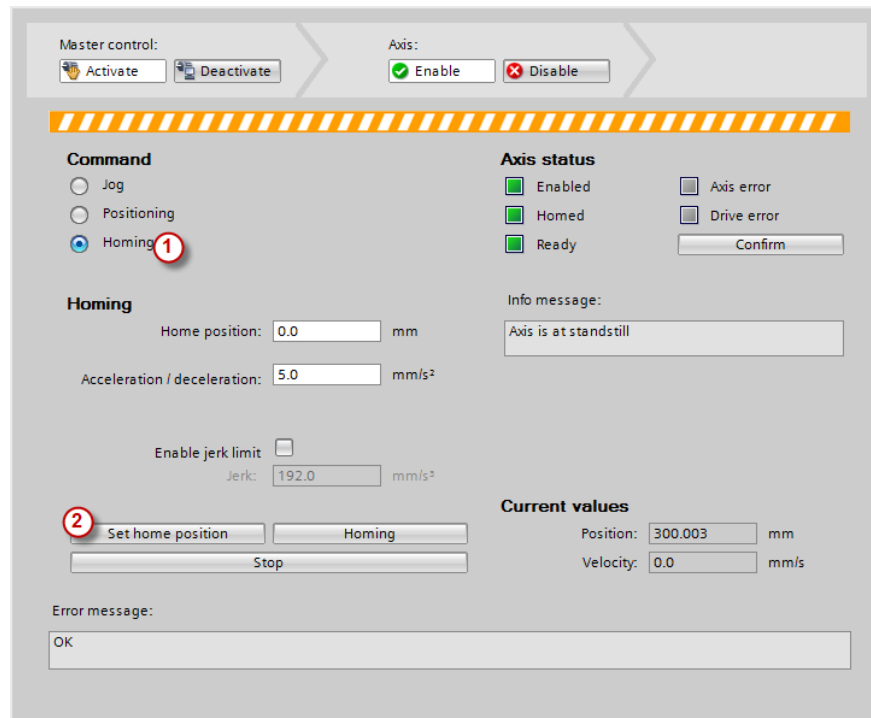
15. When the drive SON (servo is on) has been enabled, you can select a command from the command list:

Figure 5-18



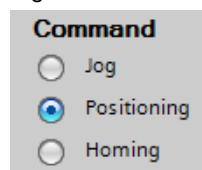
16. Select the command “**Homing**”, and then click “**Set home position**” to set current position to be position 0:

Figure 5-19



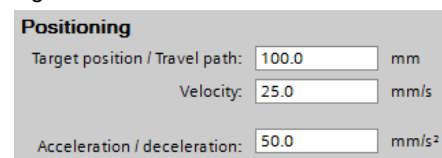
17. Press the command of “**Positioning**” :

Figure 5-20



18. Input values for positioning, for example, travel by a position or to target position of 100 mm with acceleration/deceleration of 50 mm/s^2:

Figure 5-21

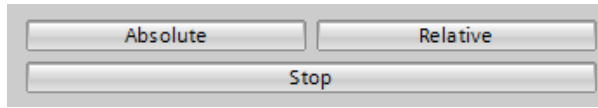


Remarks:

According to the configuration of mechanics, 100 mm means 10 motor revolutions.

19. Press “**Absolute**” or “**Relative**” to move the axis:

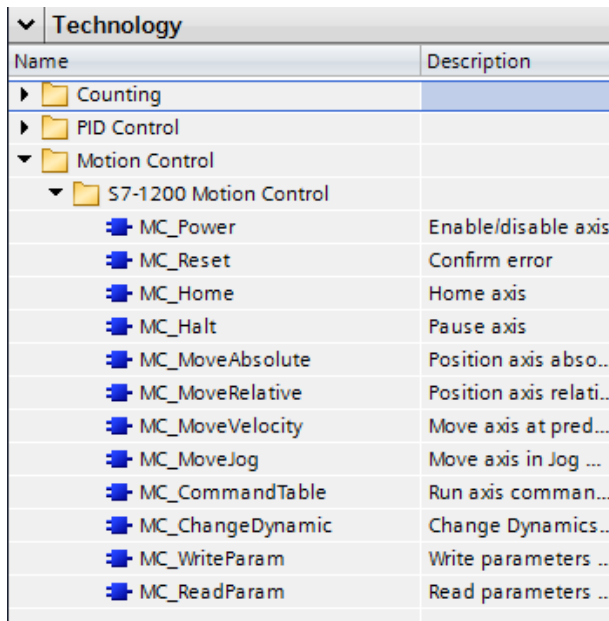
Figure 5-22



20. Deactivate the axis control and switch to offline mode. Open the main program block OB1 after that.

21. Program with the technology instructions at the right side:

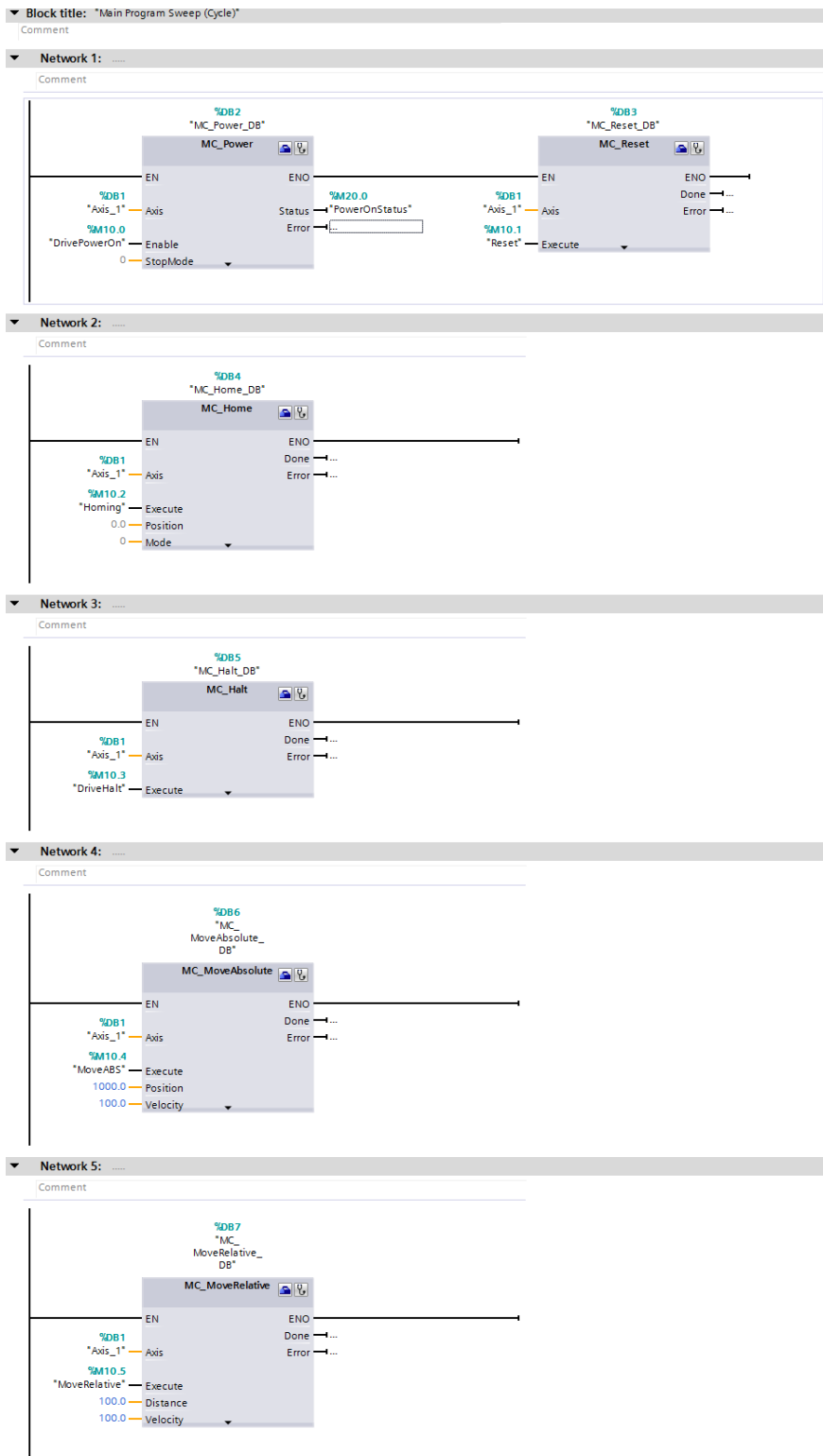
Figure 5-23



The image shows a tree view of technology instructions. The root is 'Technology', which is expanded to show 'Counting', 'PID Control', and 'Motion Control'. 'Motion Control' is further expanded to show 'S7-1200 Motion Control', which contains a list of instructions with their descriptions.

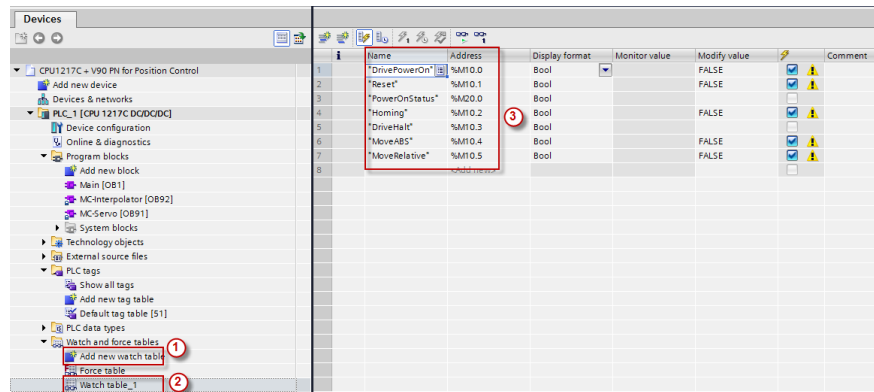
Name	Description
Counting	
PID Control	
Motion Control	
S7-1200 Motion Control	
MC_Power	Enable/disable axis
MC_Reset	Confirm error
MC_Home	Home axis
MC_Halt	Pause axis
MC_MoveAbsolute	Position axis abso...
MC_MoveRelative	Position axis relati...
MC_MoveVelocity	Move axis at pred...
MC_MoveJog	Move axis in Jog ...
MC_CommandTable	Run axis comman...
MC_ChangeDynamic	Change Dynamics...
MC_WriteParam	Write parameters ...
MC_ReadParam	Read parameters ...

22. Program as follows:



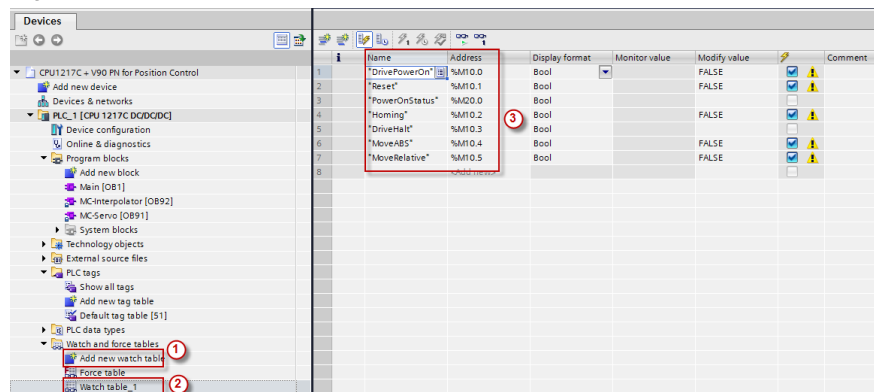
23. Add a new watch table and put all the necessary signals into this table:

Figure 5-24



24. Add a new watch table and put all the necessary signals into this table:

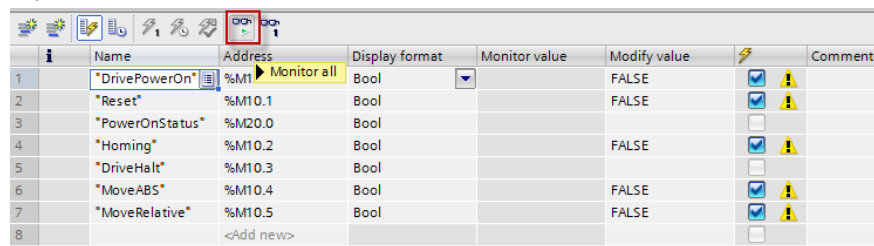
Figure 5-25



25. Compile and load the project into devices.

26. Switch to online mode and activate the monitoring function of the watch table:

Figure 5-26



27. Modify M10.0 to 1 to make drive SON:

Figure 5-27

	Name	Address	Display format	Monitor value	Modify value		Comment
1	"DrivePowerOn"	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE	<input checked="" type="checkbox"/>	
2	"Reset"	%M10.1	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
3	"PowerOnStatus"	%M20.0	Bool	<input checked="" type="checkbox"/> TRUE		<input type="checkbox"/>	
4	"Homing"	%M10.2	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
5	"DriveHalt"	%M10.3	Bool	<input type="checkbox"/> FALSE	FALSE	<input type="checkbox"/>	
6	"MoveABS"	%M10.4	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
7	"MoveRelative"	%M10.5	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
8		<Add new>				<input type="checkbox"/>	

28. Modify M10.2 to 1 to perform homing:

Figure 5-28

	Name	Address	Display format	Monitor value	Modify value		Comment
1	"DrivePowerOn"	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE	<input checked="" type="checkbox"/>	
2	"Reset"	%M10.1	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
3	"PowerOnStatus"	%M20.0	Bool	<input checked="" type="checkbox"/> TRUE		<input type="checkbox"/>	
4	"Homing"	%M10.2	Bool	<input checked="" type="checkbox"/> TRUE	TRUE	<input checked="" type="checkbox"/>	
5	"DriveHalt"	%M10.3	Bool	<input type="checkbox"/> FALSE	FALSE	<input type="checkbox"/>	
6	"MoveABS"	%M10.4	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
7	"MoveRelative"	%M10.5	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
8		<Add new>				<input type="checkbox"/>	

29. Modify M10.2 to 0 to complete homing and then modify M10.4 to 1 to move to the absolute position of 1000 mm with the speed of 100 mm/s:

Figure 5-29

	Name	Address	Display format	Monitor value	Modify value		Comment
1	"DrivePowerOn"	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE	<input checked="" type="checkbox"/>	
2	"Reset"	%M10.1	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
3	"PowerOnStatus"	%M20.0	Bool	<input checked="" type="checkbox"/> TRUE		<input type="checkbox"/>	
4	"Homing"	%M10.2	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
5	"DriveHalt"	%M10.3	Bool	<input type="checkbox"/> FALSE	FALSE	<input type="checkbox"/>	
6	"MoveABS"	%M10.4	Bool	<input checked="" type="checkbox"/> TRUE	TRUE	<input checked="" type="checkbox"/>	
7	"MoveRelative"	%M10.5	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
8		<Add new>				<input type="checkbox"/>	

30. Modify M10.4 to 0 and then modify M10.5 to 1 to move a distance of 100 mm with the speed of 100 mm/s:

Figure 5-30

	Name	Address	Display format	Monitor value	Modify value		Comment
1	"DrivePowerOn"	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE	<input checked="" type="checkbox"/>	
2	"Reset"	%M10.1	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
3	"PowerOnStatus"	%M20.0	Bool	<input checked="" type="checkbox"/> TRUE		<input type="checkbox"/>	
4	"Homing"	%M10.2	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
5	"DriveHalt"	%M10.3	Bool	<input type="checkbox"/> FALSE	FALSE	<input type="checkbox"/>	
6	"MoveABS"	%M10.4	Bool	<input type="checkbox"/> FALSE	FALSE	<input checked="" type="checkbox"/>	
7	"MoveRelative"	%M10.5	Bool	<input checked="" type="checkbox"/> TRUE	TRUE	<input checked="" type="checkbox"/>	
8		<Add new>				<input type="checkbox"/>	

31. Modify both M10.4 and M10.0 to 0 to complete operation.

6 Related literature

Table 6-1

	Topic
\1\	Siemens Industry Online Support http://support.industry.siemens.com
\2\	Download page of this entry https://support.industry.siemens.com/cs/ww/en/view/109743917
\3\	

7 Contact

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8 History

Table 8-1

Version	Date	Modifications
V1.0	11/2016	First version
V1.1	05/2018	Upgrade the project to TIA Portal V15