POSITAL

QUICK MANUAL

Profibus DP Interface Absolute Encoder

- Sample: OCD-DPC1B-1213-C10S-H3P
- PLC: Siemens S7-1200

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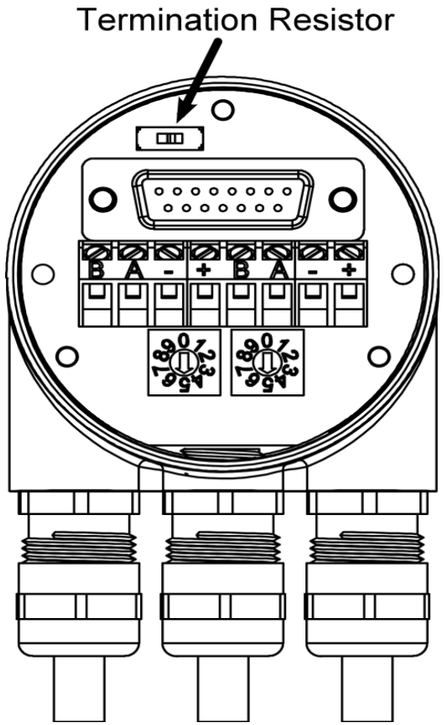
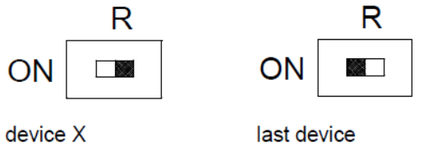
DEVICE CONNECTION

Connection Cap Settings



- 1.1 Loosen two screws of the backside of the encoder and remove the connection cap.
- 1.2 The station (node) address is set by using the rotary switches in the cap. The values (x 10 or x 1) for the switches are marked at the switch. Possible addresses are between 0 and 99. Each address can only be used once in the network.
- 1.3 If the encoder is connected at the end or beginning of the bus line the termination resistor must be switched on (slide switch in position “ON”).



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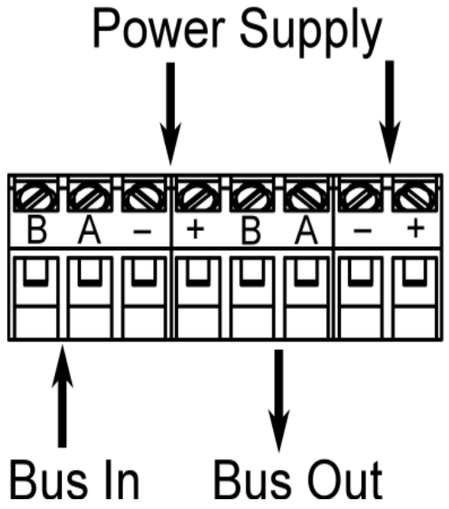
DEVICE CONNECTION

Connecting Bus Lines and Power Supply



Clamp	Description
B (left)	Bus line B (Bus in)
A (left)	Bus line A (Bus in)
–	0 V
+	10 – 30 V
B (right)	Bus line B (Bus out)
A (right)	Bus line A (Bus out)
–	0 V
+	10 – 30 V

- Notes: The power supply has to be connected once (no matter which clamps). If the terminating resistor is switched on, the outgoing bus lines are disconnected.

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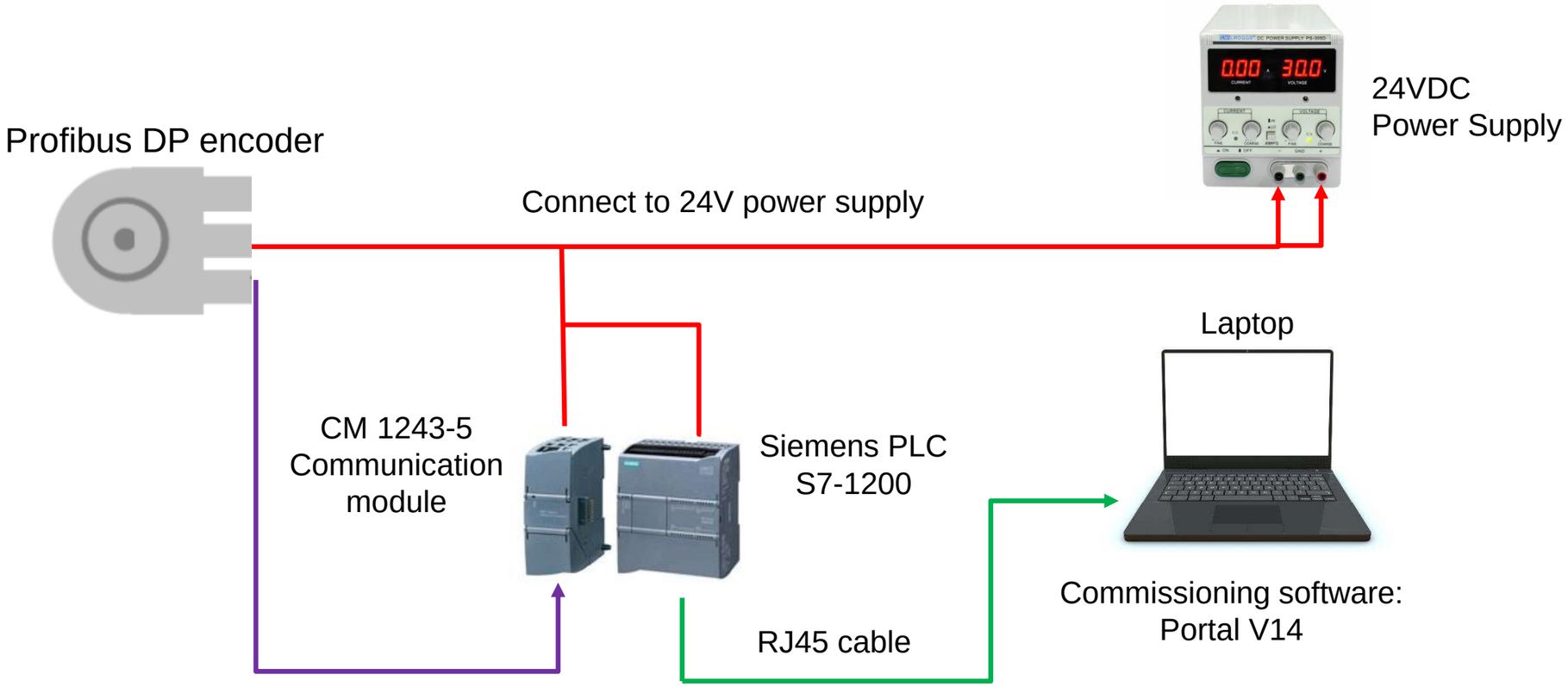
DEVICE CONNECTION

Cable Connection



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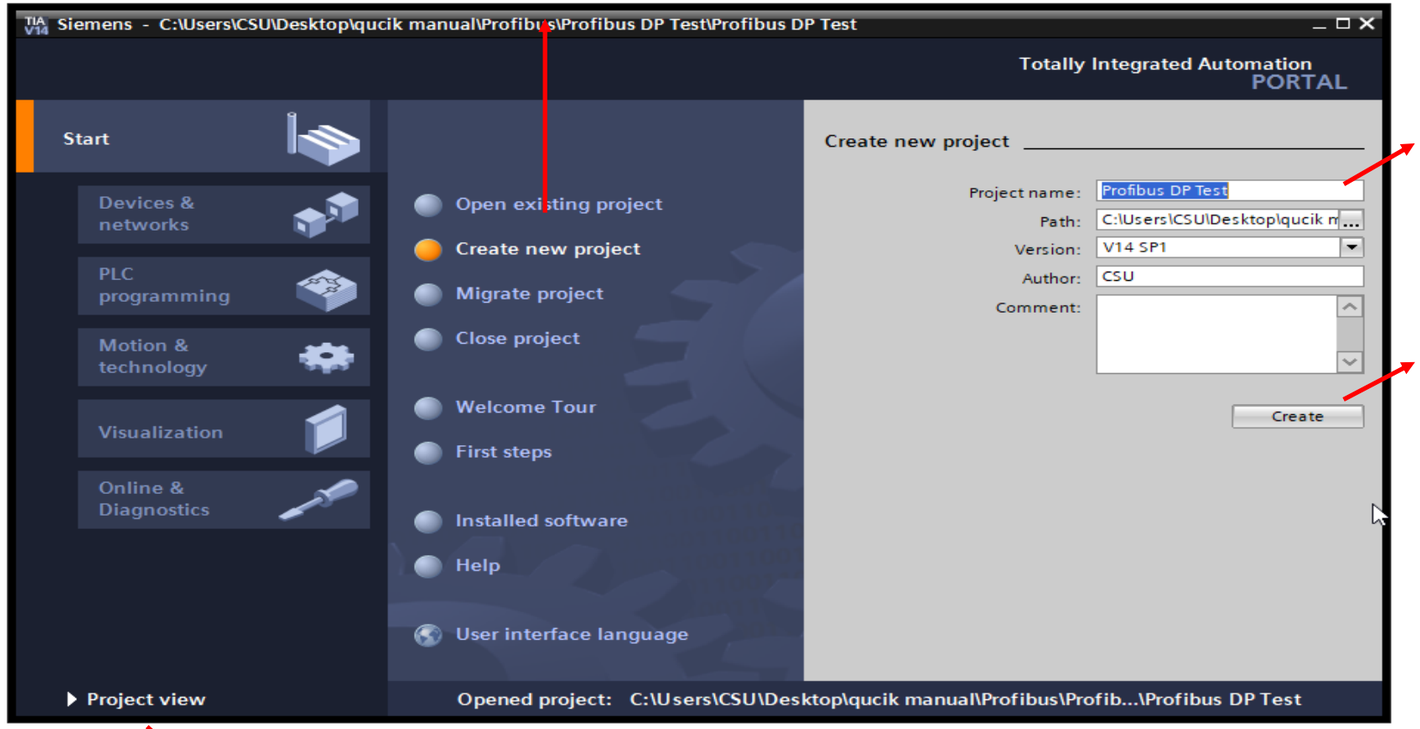
COMMNUNICATION CONNECTION

Project Creation

1. Create a new project.



2. Set project name.

3. Click on the create.

4. Switch to the project view.

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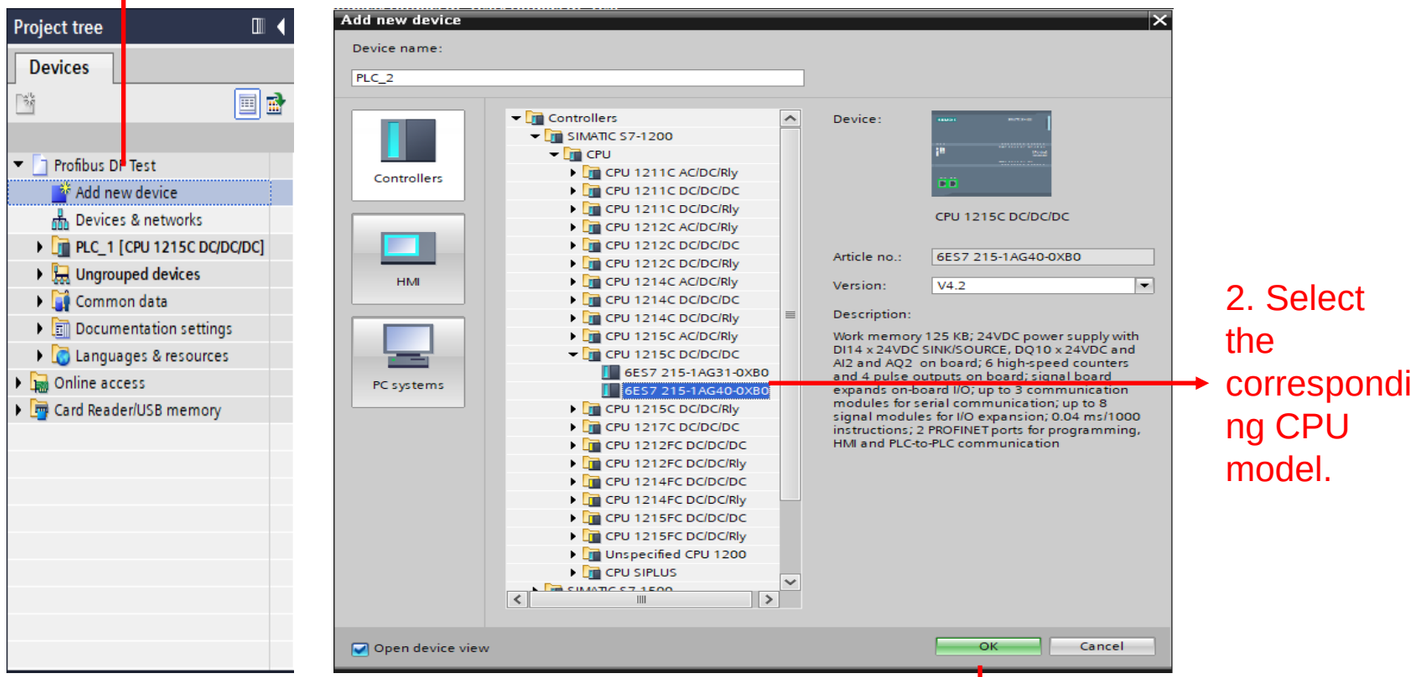
COMMNUNICATION CONNECTION

PLC Settings

1. Double-click to add a new device.



2. Select the corresponding CPU model.

3. Click ok.

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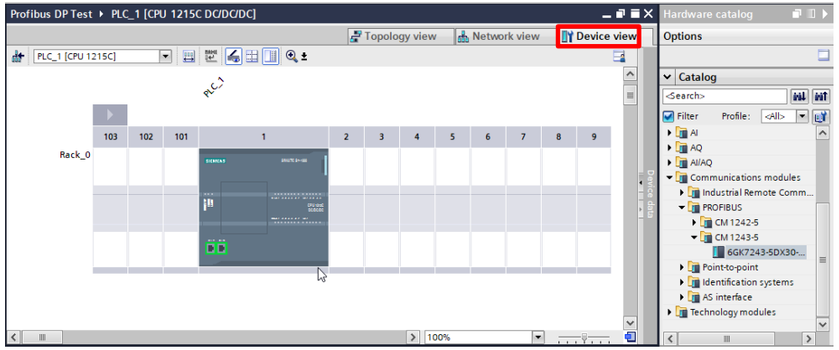
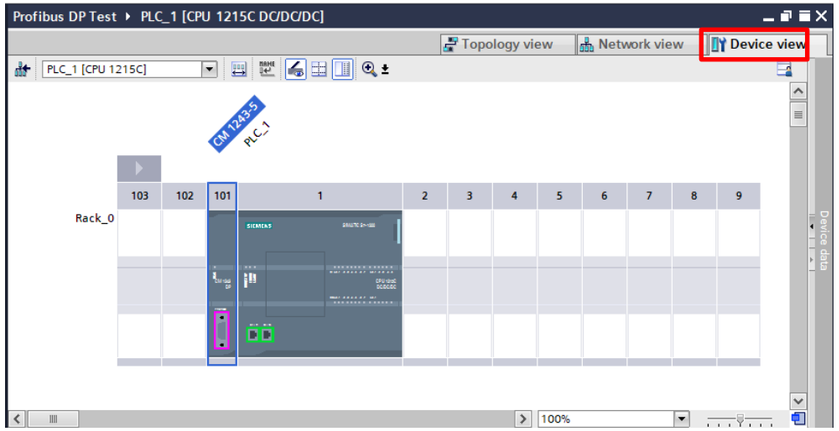
COMMNUNICATION CONNECTION

Communication Module Setting





- 1.Select the corresponding communication module under “device view”.

- 2. Drag the communication module to the left of the PLC.

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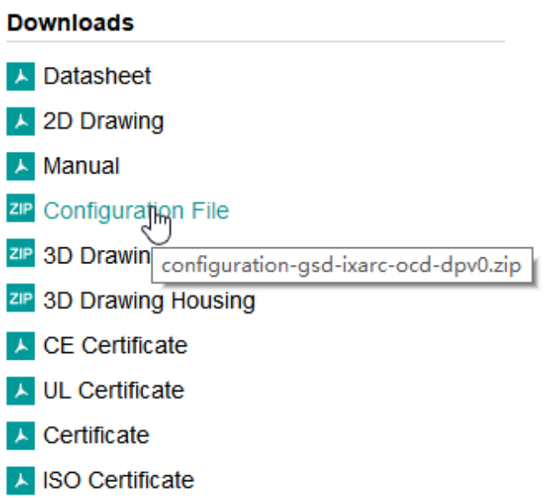
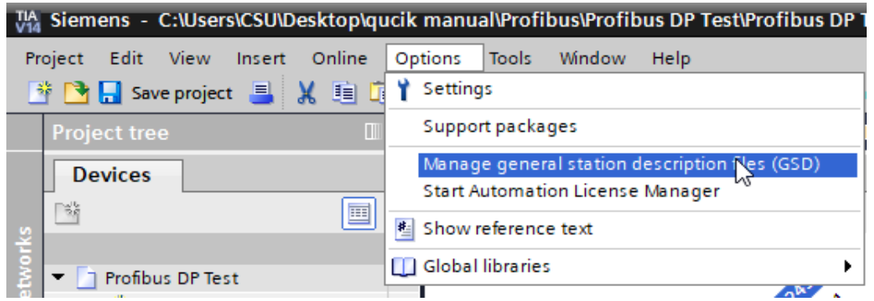
COMMNUNICATION CONNECTION

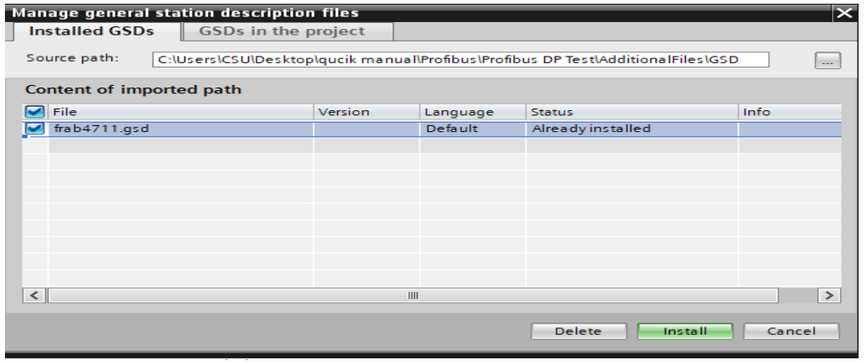
Import GSD File



1. Download the corresponding GSD file from the right side of the product data page of the official website of Posital and save it to the desktop.



2. Under options, select manage general station description file (GSD).



3. Select the FRABA GSD file and install it.

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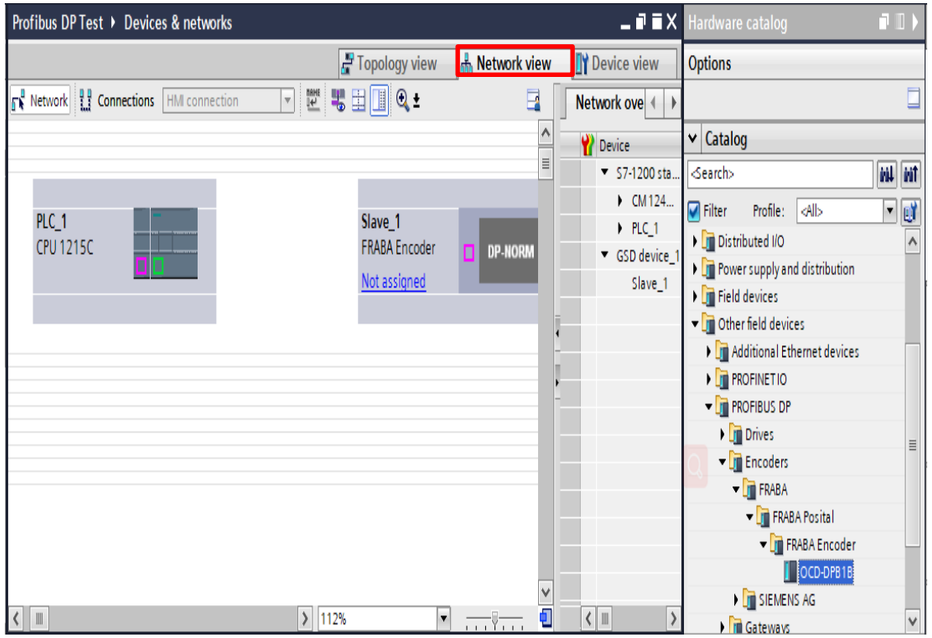
COMMNUNICATION CONNECTION

Profibus DP Encoder Setting



- 1.Under network view, select “Other field devices”→ “Porfibus DP” → “Encoders” → “FARBA” → “FRABA Posital” → “FRABA Encoder” → “OCD-DPB1B”

- 2. Drag the selected encoder into network view.

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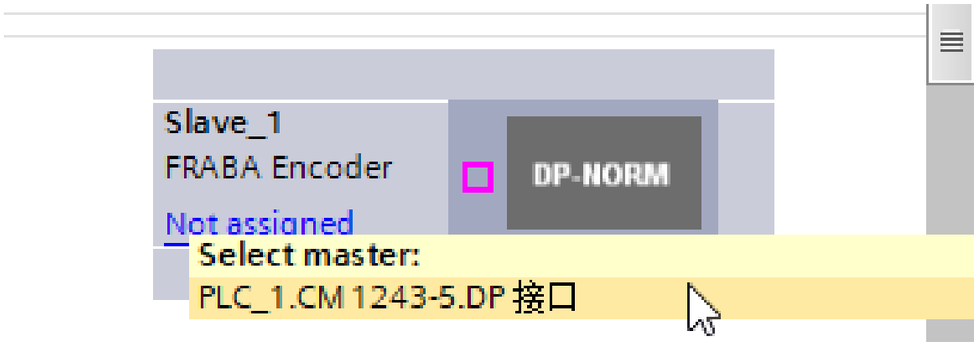
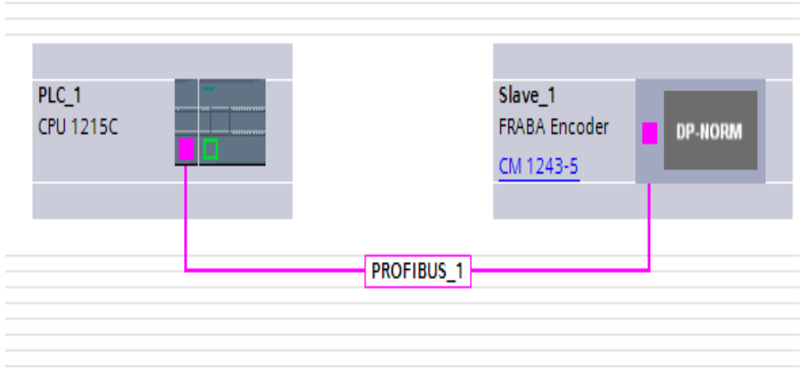
COMMNUNICATION CONNECTION

Profibus DP Interface Connection



1. Under network view, select "FRABA Encoder" and click “Not assigned"
2. Select master station: plc_1.cm 1243-5.dp interface



3. Complete the hardware configuration connection between encoder and PLC

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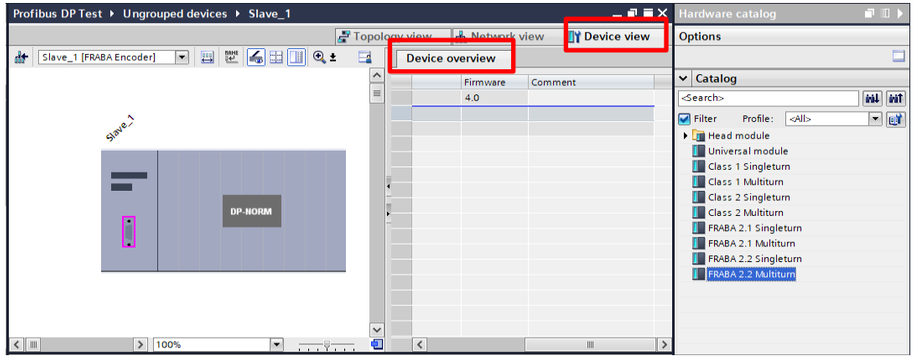
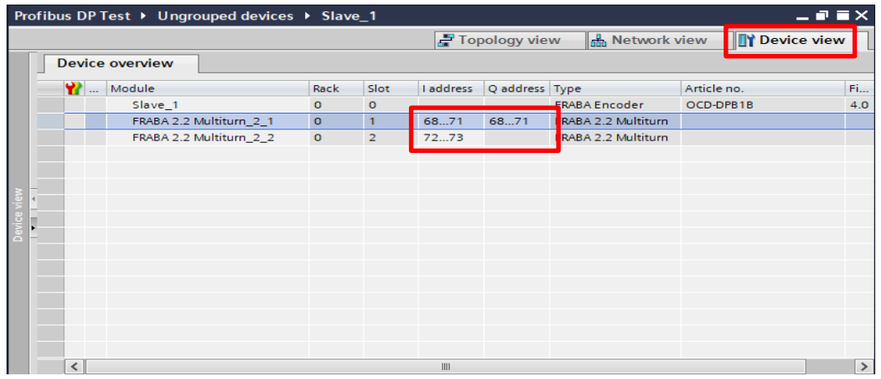
COMMNUNICATION CONNECTION

Encoder Input/output Address Setting



- 1.Under device view, select the Posital encoder.
- 2. Select the encoder feature configuration version and drag in the device overview.

Note: this manual takes "FRABA 2.2 Multiturn" as an example. This version has the most complete programming functions.



- 3. Set encoder input/output address:
  I address: 68...71, 72...73
  Q address: 68...71

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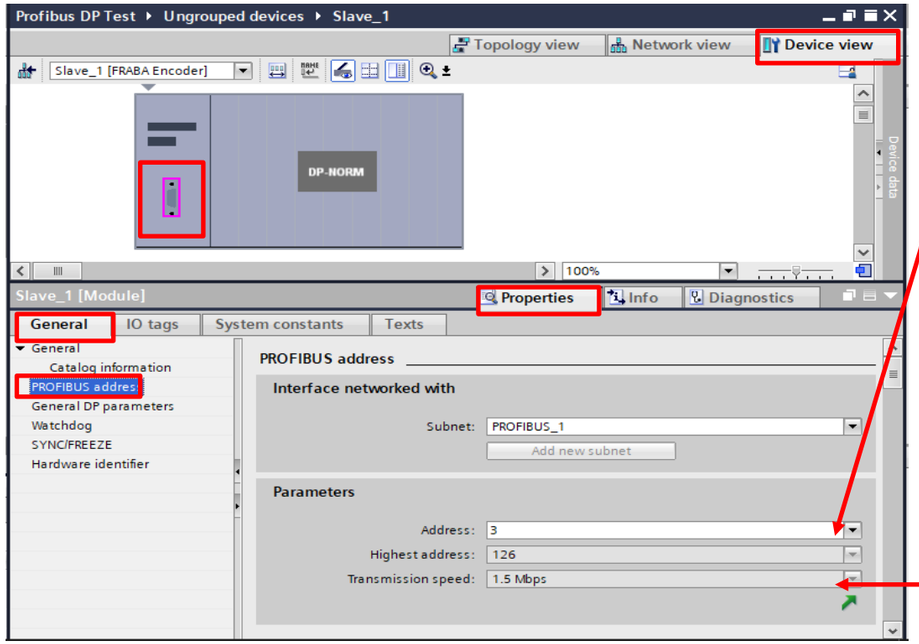
COMMNUNICATION CONNECTION

Encoder Profibus Address Setting



1. Encoder Profibus address setting:

Note: the value shall be the same as that set by the address rotation switch of the connection cap of the encoder, see Page 1.

2.Transmission speed.

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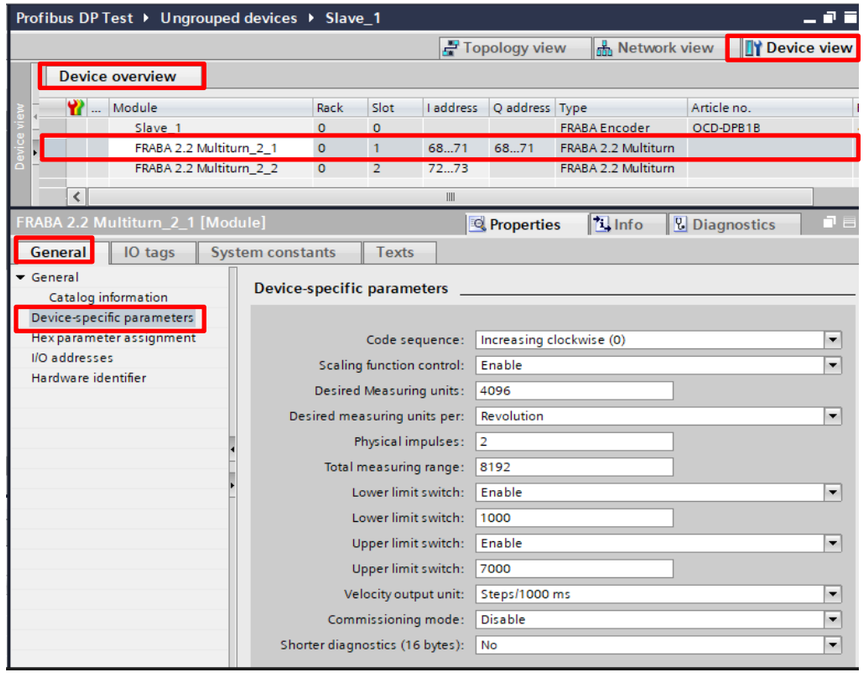
ENCODER CONFIGURATION

Encoder Parameter Settings



Select “Device view”→select “Device overview”→Right click on the “FRABA 2.2 Multiturn”→ “General”→ “Devicespecific parameters”，encoder parameter setting:

- 1.Code sequence
- 2.Desired measuring units
- 3.Revolution
- 4.Total measuring range
- 5.Lower/Upper limit switch: disable by default.
- 6.Velocity output unit
- 7.Commissioning mode: disable by default.
- 6.Shorter diagnostics(16 bytes)：disable by default.

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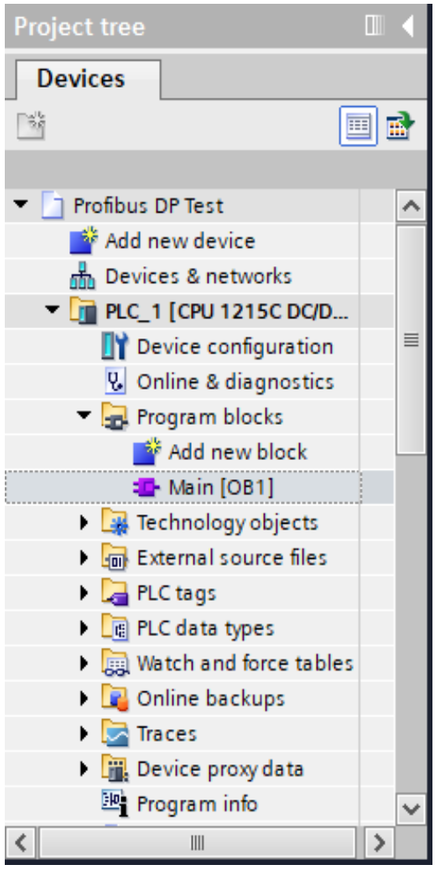
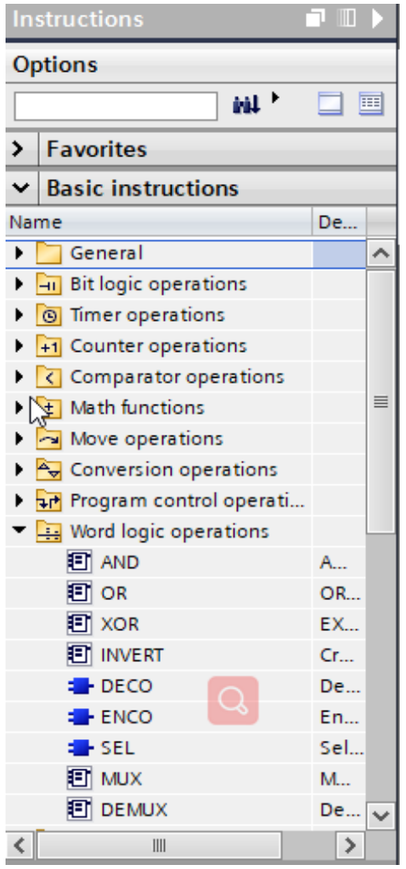
ENCODER CONFIGURATION

Program Blocks



- 1. Write the program under Main[OB1]



The instruction that the program needs to invoke

- 1.Bit logic operation, -|, P|- : when the signal rising edge is scanned, a scanning cycle is switched on
- 2.Bit logic operation, -||-: normally open contact
- 3.Bit logic operation, -|/|- : normally closed contact
- 4.Bit logic operation, -()- : coil
- 5.MOVE operation: to MOVE the value to the specified storage bit
- 6.Word logic operation，AND：And logic operation
- 7.Math functions, CALCULATE

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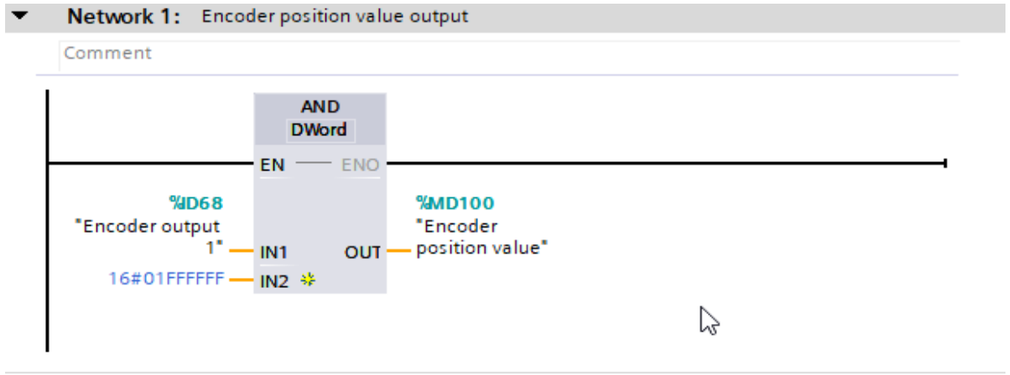
ENCODER CONFIGURATION

Network 1: Encoder Position Value Output

OCD → Master	Status + position value			
	Status + 2^{24}	2^{23} - 2^{16}	2^{15} - 2^{8}	2^{7} - 2^{0}



- 1. Encoder output value Bit0-Bit24: position value
- 2. Encoder output value bit25-bit31: status value
- 3. When reading the position value, the state value "bit25-bit31" should be cleared by using logical operation, and the program section is shown as left:
- Note: first enter the address bit, such as ID68, MD100, then modify the variable name

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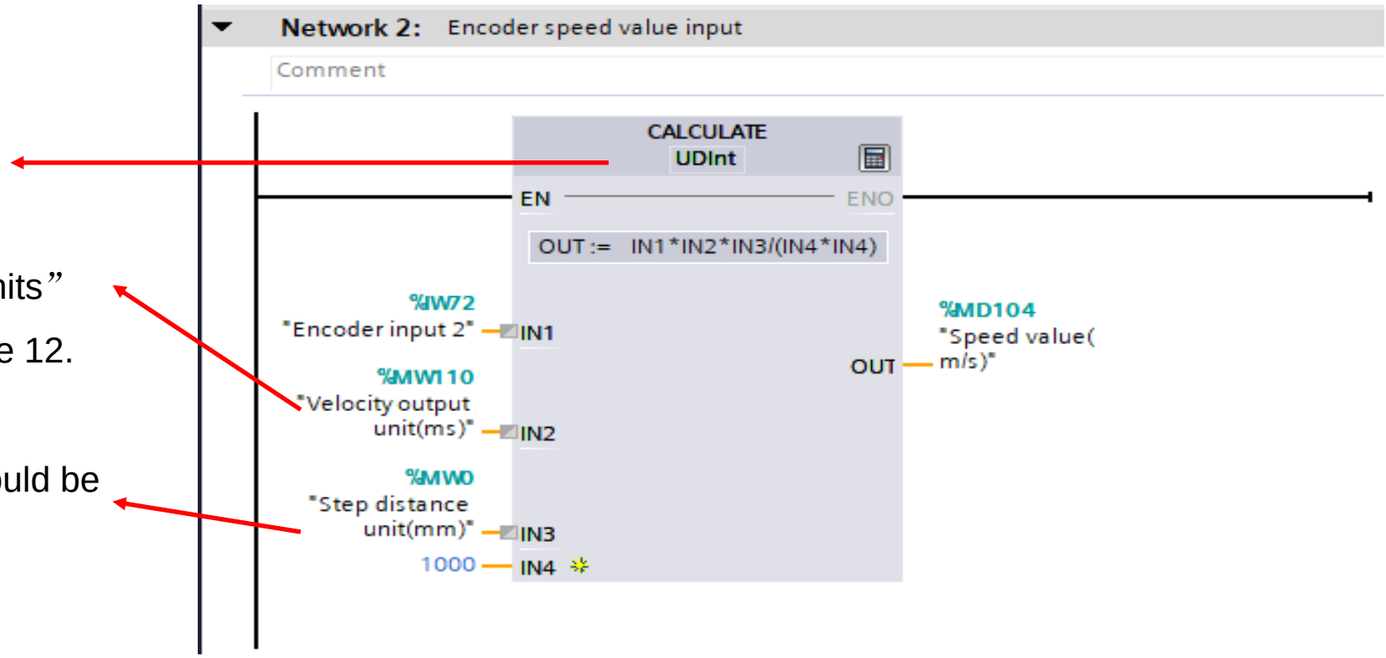
ENCODER CONFIGURATION

Network 2: Encoder Speed Value Input

- 1. Select unsigned long integer “UDInt”.
- 2.Value of “Velocity output units” need to be set the same as Page 12.
- 3. The "step distance unit" should be set to the actual distance unit.



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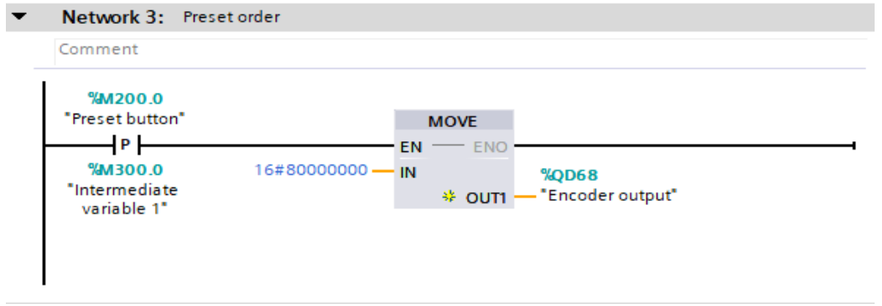
ENCODER CONFIGURATION

Network 3: Preset Order

1.To activate the preset order, Bit31 of the input value to the encoder need to be set to 1.

	Status bits							Data bits																							
Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Master → OCD	1	0	0	0	0	0	0	Transfer of the required position value (= preset value)																								
OCD → Master	1	0	0	0	0	0	1	New = required position value is transferred																								
Master → OCD	0	0	0	0	0	0	0	Reset bit 31 – normal mode																								
OCD → Master	0	0	0	0	0	0	1	New = required position value is transferred																								

2.Transfer "16#80000000" to "QD68" by MOVE instruction to achieve Bit31 to 1.



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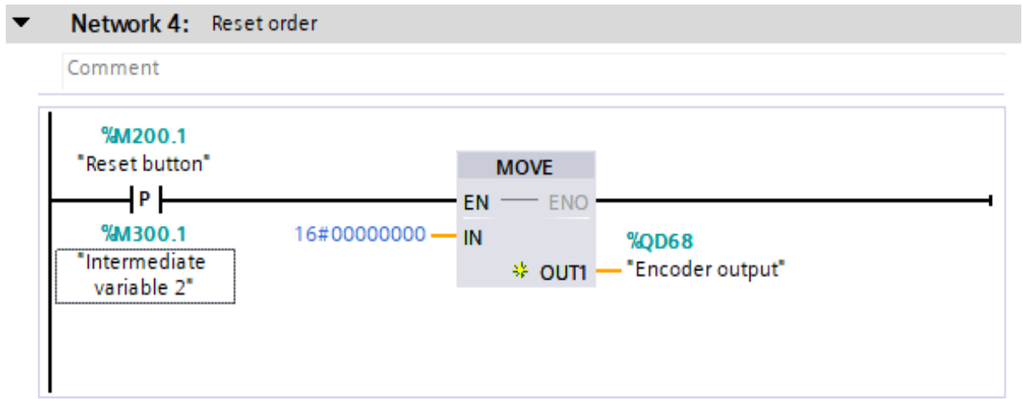
ENCODER CONFIGURATION

Network 4: Reset Order

- 1. After each execution of the preset command, Bit31 should be reset before the next preset order.

		Status bits							Data bits																			
	Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Master → OCD		1	0	0	0	0	0	0	Transfer of the required position value (= preset value)																								
OCD → Master		1	0	0	0	0	0	1	New = required position value is transferred																								
Master → OCD		0	0	0	0	0	0	0	Reset bit 31 – normal mode																								
OCD → Master		0	0	0	0	0	0	1	New = required position value is transferred																								

- 2. Transfer "16#00000000" to "QD68" by MOVE instruction to achieve Bit31 to 0.



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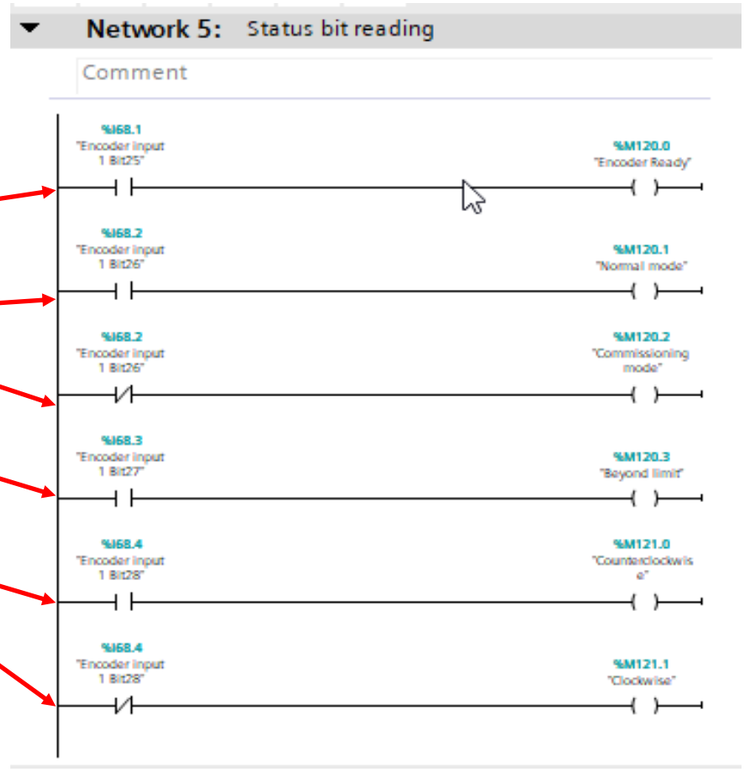
ENCODER CONFIGURATION

Network 5: Status Bit Reading

Bit 28	Bit 27	Bit 26	Bit 25	Meaning
				Ready
				0 = encoder is not ready for operation
				1 = encoder is ready for operation
				Mode
				0 = commissioning mode
				1 = normal mode
				Software limit switch
				0 = lower limit switch ≤ current position value ≤ upper limit switch
				1 = current position value > upper limit switch or current position value < lower limit switch
				Code sequence
				0 = increasing clockwise (view onto the shaft)
				1 = increasing counter clockwise (view onto the shaft)



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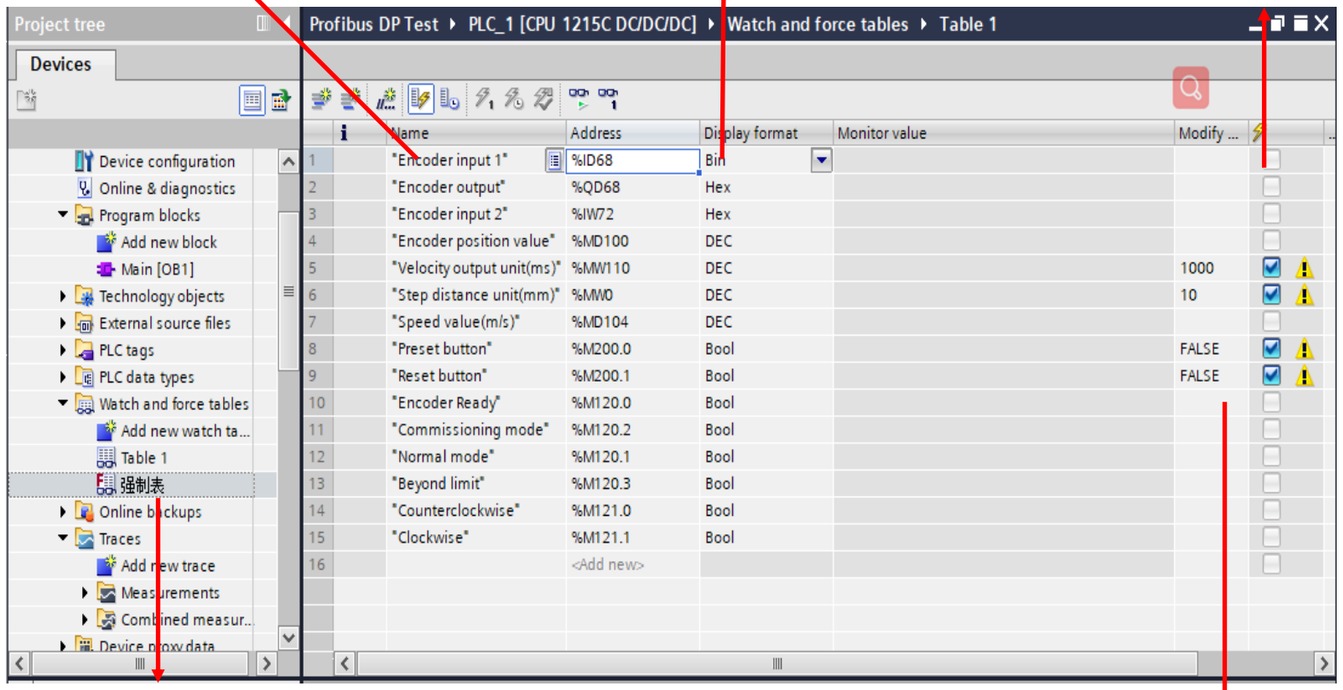
ENCODER CONFIGURATION

Watch and Force Table

2. Add the corresponding variable.

3.Select display format.

5. Select the variable to modify.



1. Add a new watch table.

4. Set the modify value.

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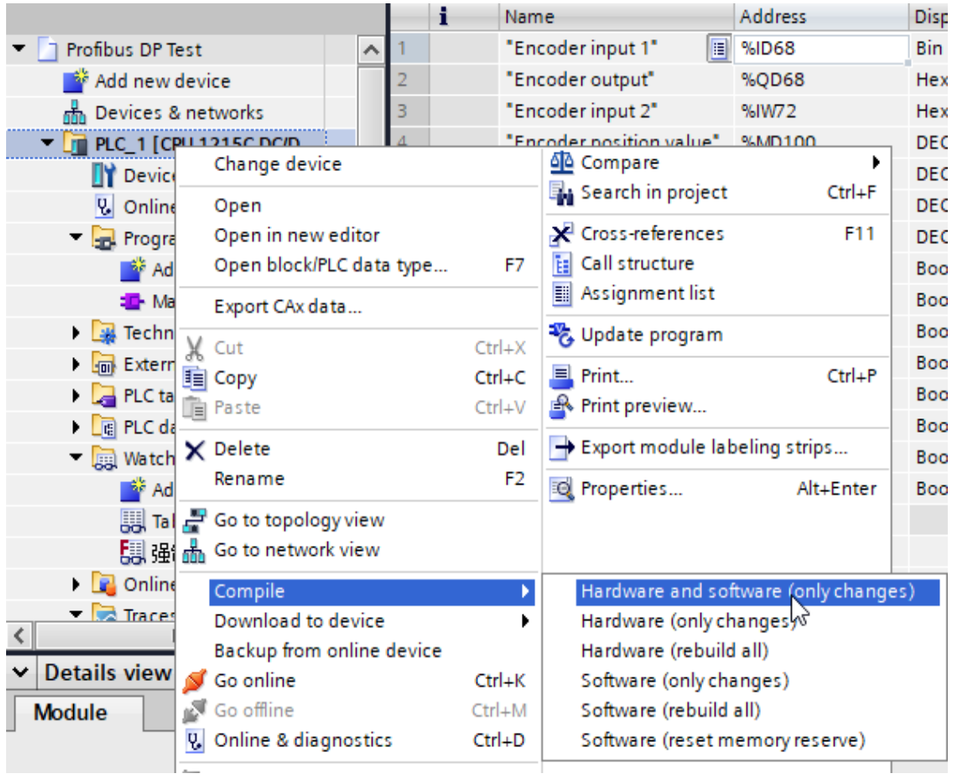
ENCODER CONFIGURATION

Compile



1. Right-click PLC→ select "compile" → select "hardware and software (only changes)".
2. Check that the hardware and software configuration Settings are correct.

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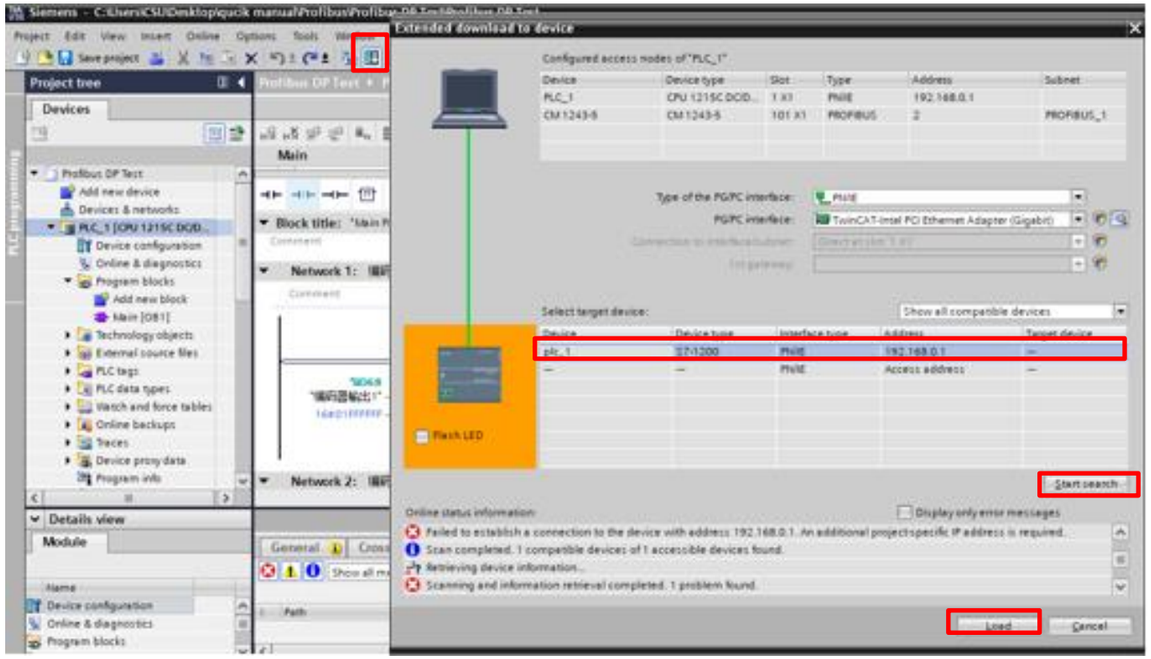
ENCODER CONFIGURATION

Download Configuration to PLC



- 1. Click the download button.
- 2. Begin your search.
- 3. Select the corresponding PLC.
- 4. Click download.
- 5. Click "all started" after downloading.

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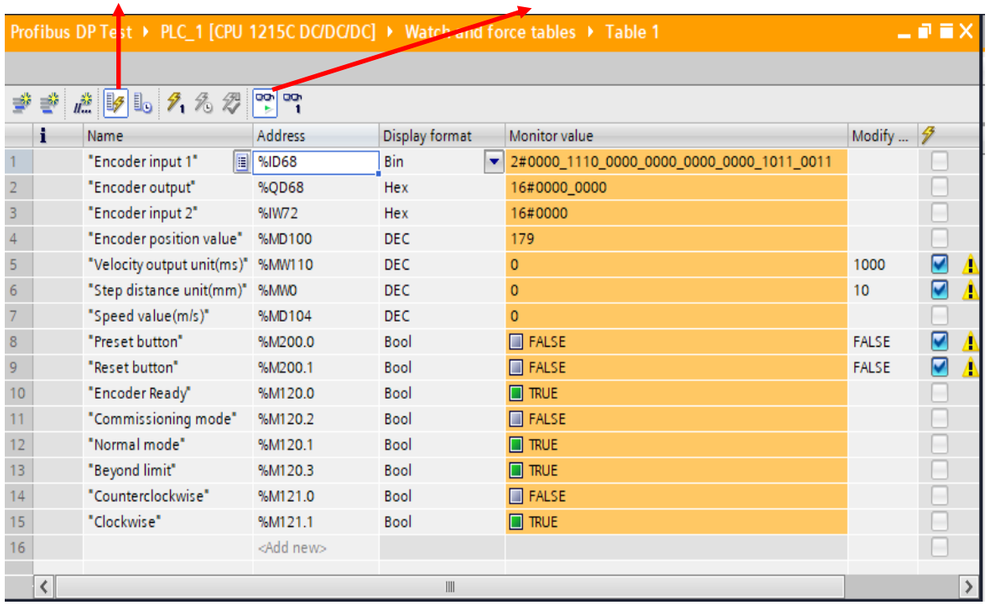
ENCODER CONFIGURATION

Watch and Force

2. Modify all select value.

1.Monitor all.



	Name	Address	Display format	Monitor value	Modify ...
1	"Encoder input 1"	%ID68	Bin	2#0000_1110_0000_0000_0000_0000_1011_0011	
2	"Encoder output"	%QD68	Hex	16#0000_0000	
3	"Encoder input 2"	%IW72	Hex	16#0000	
4	"Encoder position value"	%MD100	DEC	179	
5	"Velocity output unit(ms)"	%MW110	DEC	0	1000
6	"Step distance unit(mm)"	%MW0	DEC	0	10
7	"Speed value(m/s)"	%MD104	DEC	0	
8	"Preset button"	%M200.0	Bool	FALSE	FALSE
9	"Reset button"	%M200.1	Bool	FALSE	FALSE
10	"Encoder Ready"	%M120.0	Bool	TRUE	
11	"Commissioning mode"	%M120.2	Bool	FALSE	
12	"Normal mode"	%M120.1	Bool	TRUE	
13	"Beyond limit"	%M120.3	Bool	TRUE	
14	"Counterclockwise"	%M121.0	Bool	FALSE	
15	"Clockwise"	%M121.1	Bool	TRUE	
16		<Add new>			

- 1.After switching to online, observe the parameters of each variable.
- 2. Changing “Preset button“ the value to 1 and then the current position value is set to 0. After activation, changing “Reset button” to 1 and activate, and then can preset again.
- 3. "Velocity output unit" should be the same as the parameters set in Page 12.
- 4. "step distance unit" shall be set with the actual distance unit

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