

PROFIBUS-DP interface

Absolute rotary encoder operation example



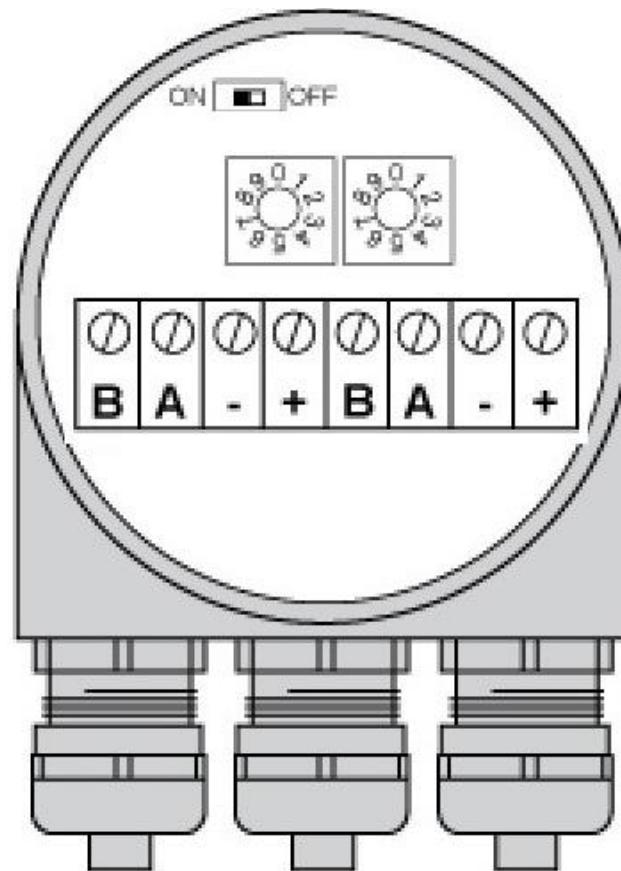
Section 1: Operating Environment

1. The computer uses the genuine Windows 11 Home Chinese Edition system, a 64-bit operating system, and an x64-based processor.
2. The software uses TIA PORTAL V17 and genuine Botu V17.
3. The PLC uses SIMATIC S7-300 6ES7 315-2AG10-0XB0.



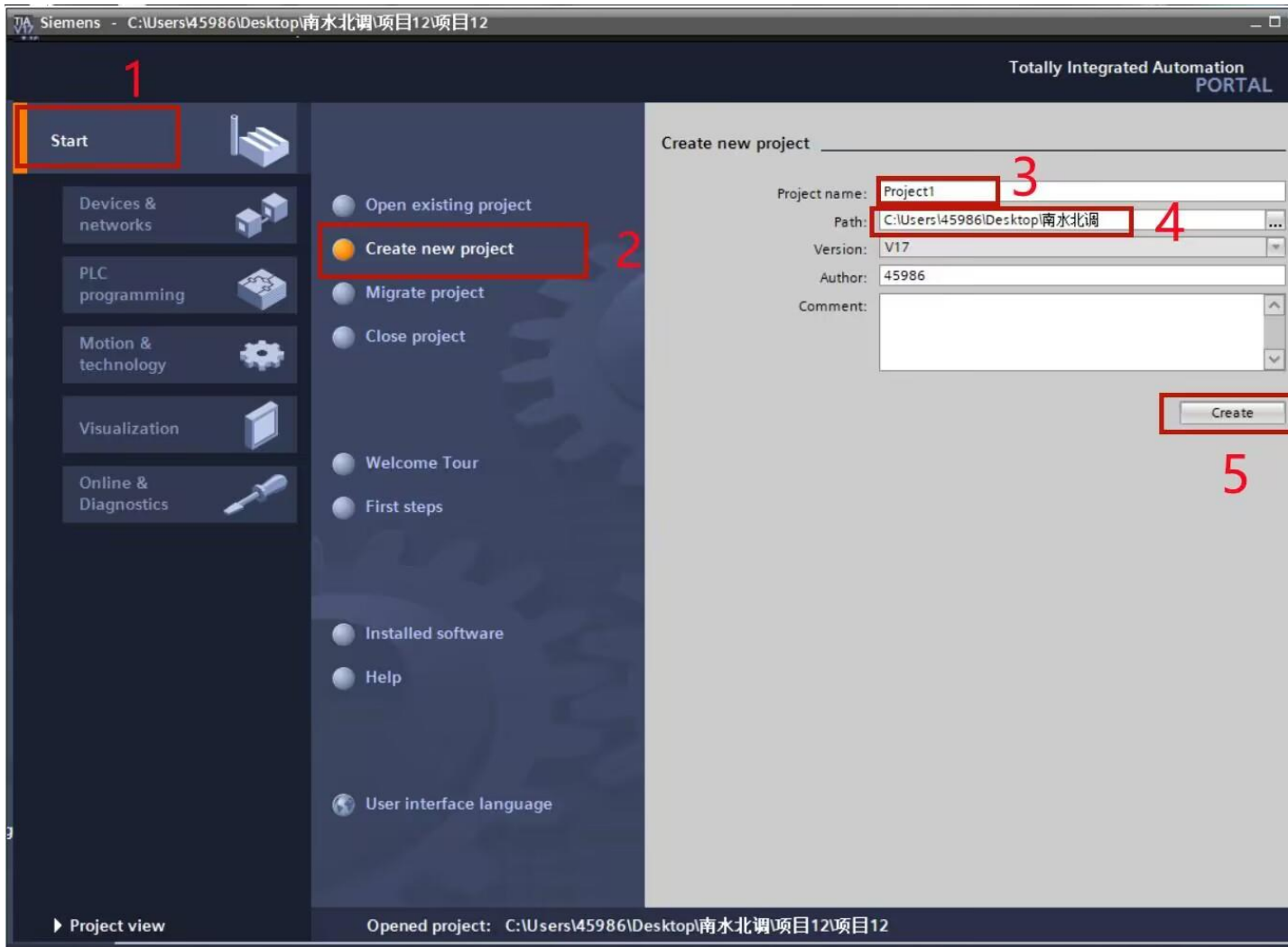
Section 2: Wiring Attention Diagram

1. Both PLC and encoder are powered by 24V DC.
2. Remove the junction box at the end of the encoder, and connect the wiring as shown in the figure below.

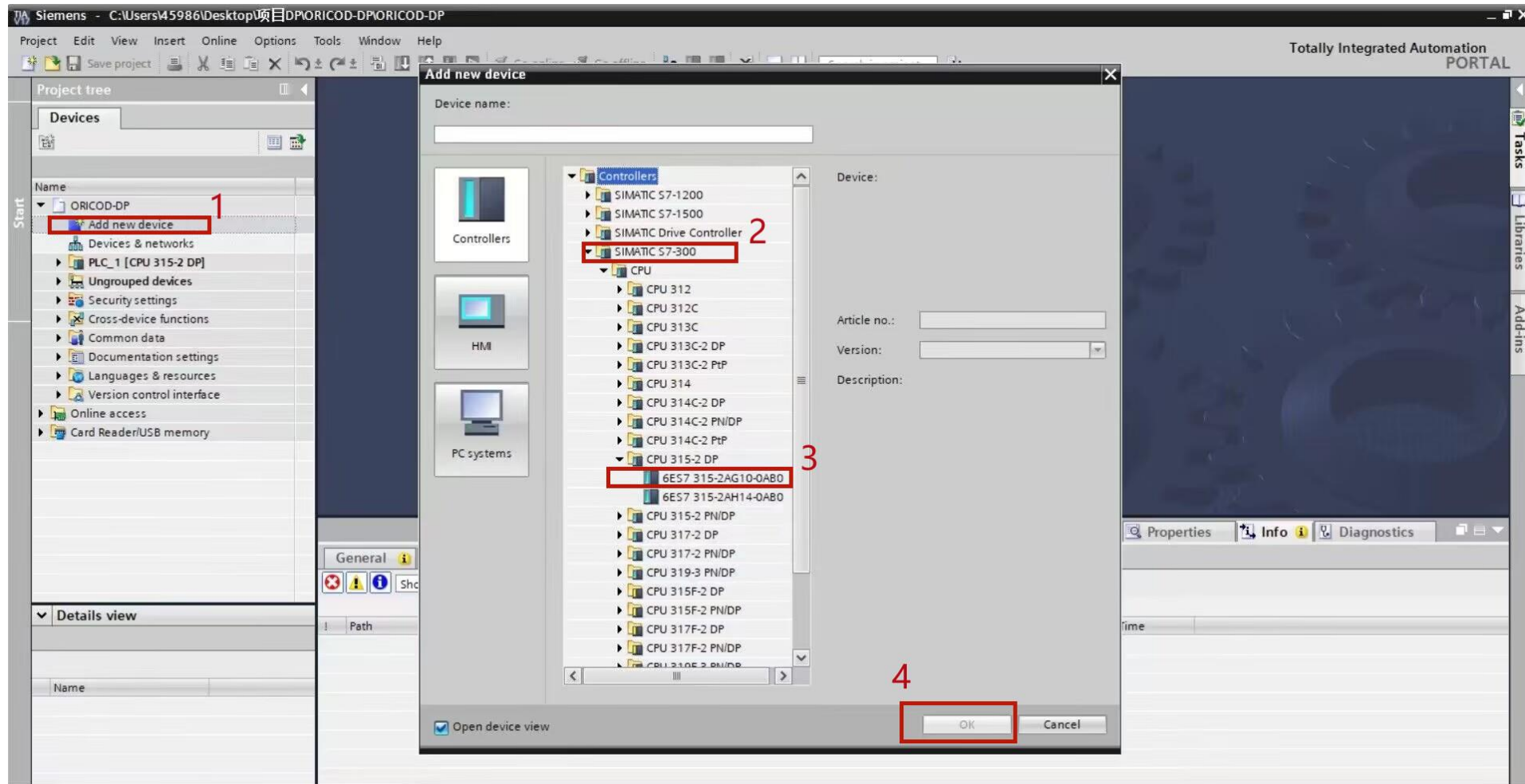


Section 3: Configuration

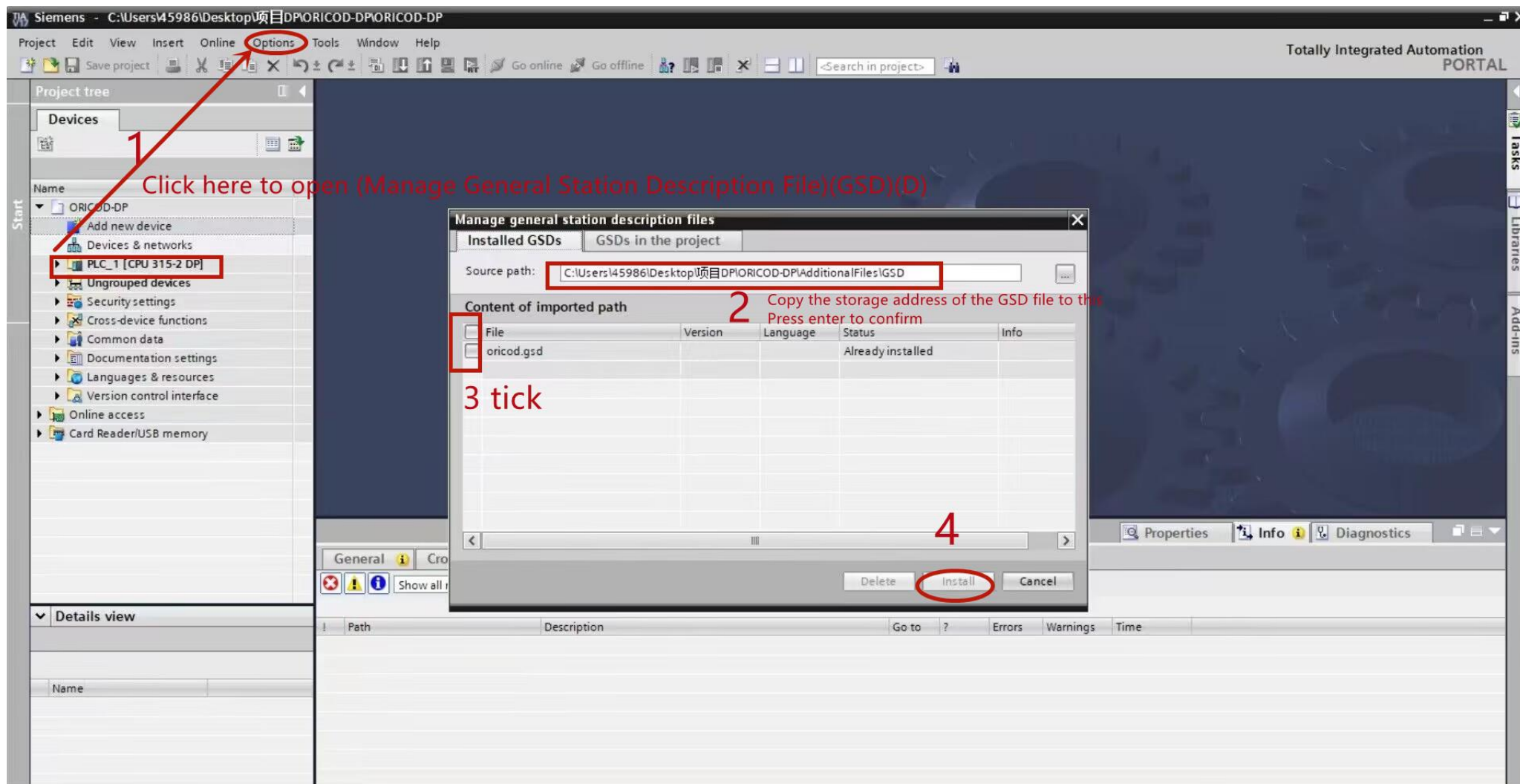
1. Create a new project



2: Add new device (PLC)



3: Install the GSD file



1 Click here to open (Manage General Station Description File)(GSD)(D)

2 Copy the storage address of the GSD file to this
Press enter to confirm

3 tick

4

Manage general station description files

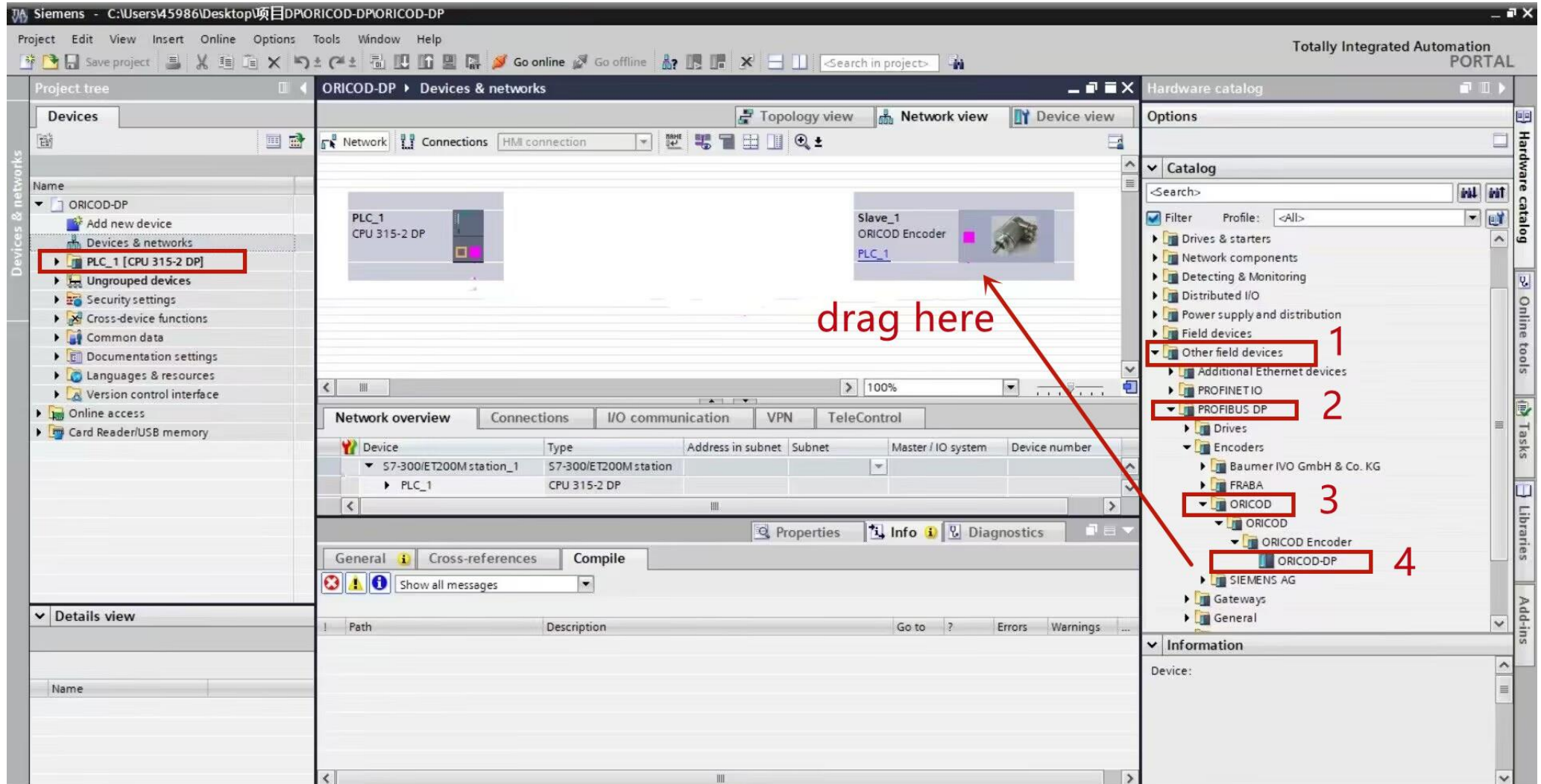
Installed GSDs | GSDs in the project

Source path: C:\Users\45986\Desktop\项目DPIORICOD-DPI\AdditionalFiles\GSD

File	Version	Language	Status	Info
oricon.gsd			Already installed	

Delete Install Cancel

4: Add encoder device module



The screenshot shows the Siemens TIA Portal interface with the following components:

- Project tree (left):** Shows the project structure. The "PLC_1 [CPU 315-2 DP]" is highlighted with a red box.
- Network view (center):** Displays the network topology. A "Slave_1 ORICOD Encoder" is shown connected to "PLC_1". A red arrow points to it with the text "drag here".
- Hardware catalog (right):** Shows the device selection process. The following items are highlighted with red boxes and numbered:
 1. Other field devices
 2. PROFIBUS DP
 3. ORICOD
 4. ORICOD-DP
- Network overview table (bottom center):**

Device	Type	Address in subnet	Subnet	Master / IO system	Device number
S7-300/ET200M station_1	S7-300/ET200M station				
PLC_1	CPU 315-2 DP				
- Properties/Info/Diagnostics (bottom right):** Shows the selected device's properties.

5: Assign encoder name

Siemens - C:\Users\45986\Desktop\项目\DP\ORICOD-DP\ORICOD-DP

Project Edit View Insert Online Options Tools Window Help

Save project Go online Go offline Search in project

Project tree

Devices

ORICOD-DP

Add new device

Devices & networks

PLC_1 [CPU 315-2 DP]

Ungrouped devices

Security settings

Cross-device functions

Common data

Documentation settings

Languages & resources

Version control interface

Online access

Card Reader/USB memory

Details view

Name

Path

Description

Go to ? Errors Warnings

Topology view Network view Device view

Slave_1 [ORICOD Encoder]

Slave_1

Device overview

Module	Rack	Slot	I address	Q address	Type	Article no.	Firmware
Slave_1	0	0	2046*		ORICOD Encoder	ORICOD-DP	4.0
ORICOD 2.2 Multiturn_2_1	0	1	256...259	256...259	ORICOD 2.2 Multiturn		
ORICOD 2.2 Multiturn_2_2	0	2	260...261		ORICOD 2.2 Multiturn		

drag here

Hardware catalog

Options

Catalog

Search

Filter Profile: <All>

Head module

Universal module

Class 1 Singleturn

Class 1 Multiturn

Class 2 Singleturn

Class 2 Multiturn

ORICOD 2.1 Singleturn

ORICOD 2.1 Multiturn

ORICOD 2.2 Singleturn

ORICOD 2.2 Multiturn

Information

Device:

6: Connect PLC and encoder

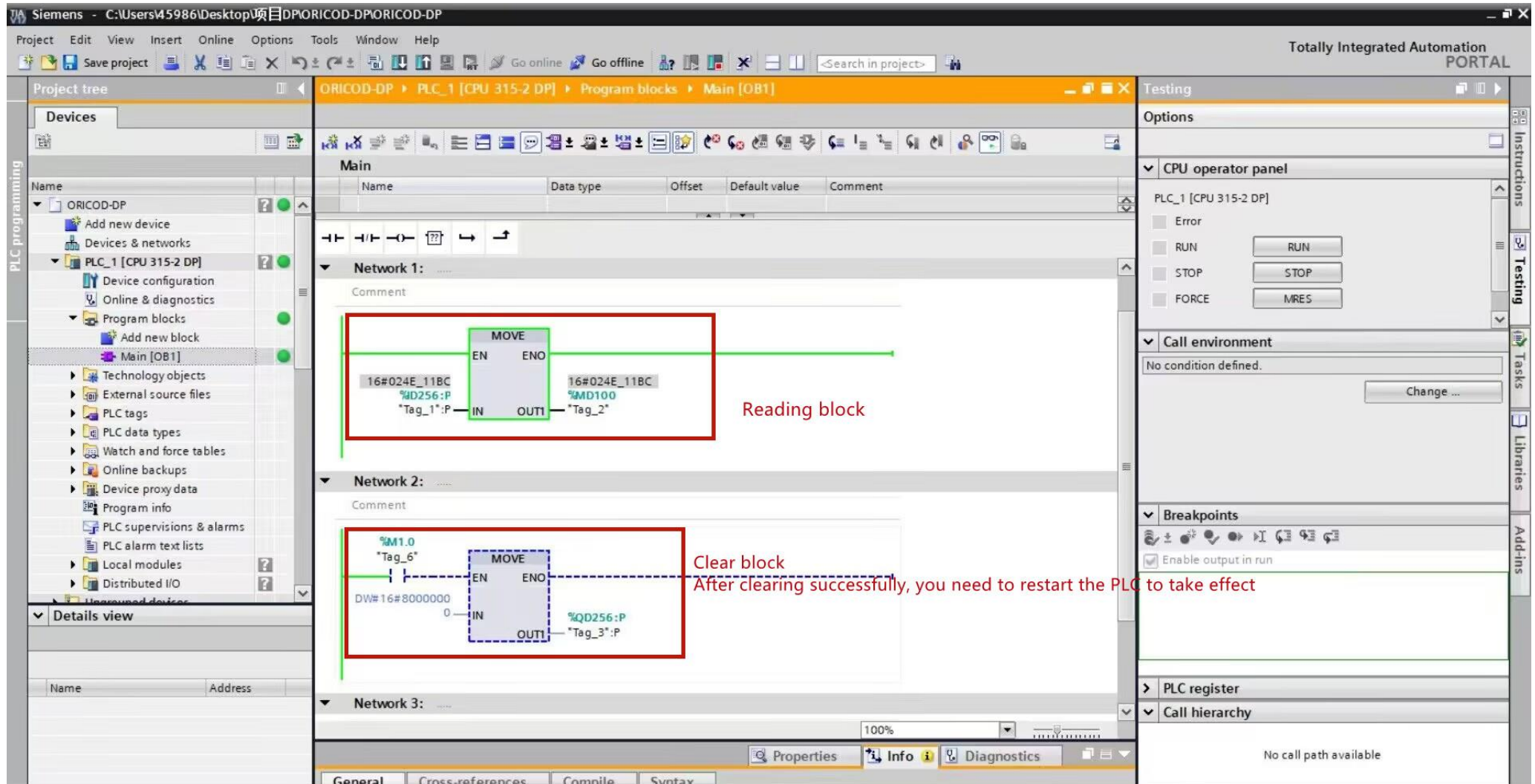
The screenshot displays the Siemens SIMATIC Manager interface for a project named 'ORICOD-DP'. The 'Network view' is active, showing a connection between 'PLC_1' (CPU 315-2 DP) and 'Slave_1' (ORICOD Encoder) via a 'PROFIBUS_1' network. Red arrows and text annotations guide the user through the steps:

- 1. Connect the two small purple boxes:** Points to the connection line between the PLC and the encoder.
- 2. compile:** Points to the 'Compile' button in the top toolbar.
- 3. Download:** Points to the 'Download' button in the top toolbar.
- 4. Go online:** Points to the 'Go online' button in the top toolbar.

The 'Hardware catalog' on the right shows the 'ORICOD' device selected under 'PROFIBUS DP' > 'Encoders'. The 'Network overview' table at the bottom provides details about the connected devices:

Device	Type	Address in subnet	Subnet	Master / IO system	Device number
GSD device_1	GSD device				
Slave_1	ORICOD Encoder	3	PROFIBUS_1	DP-Mastersystem	

7. Read encoder data program segment and clear program segment

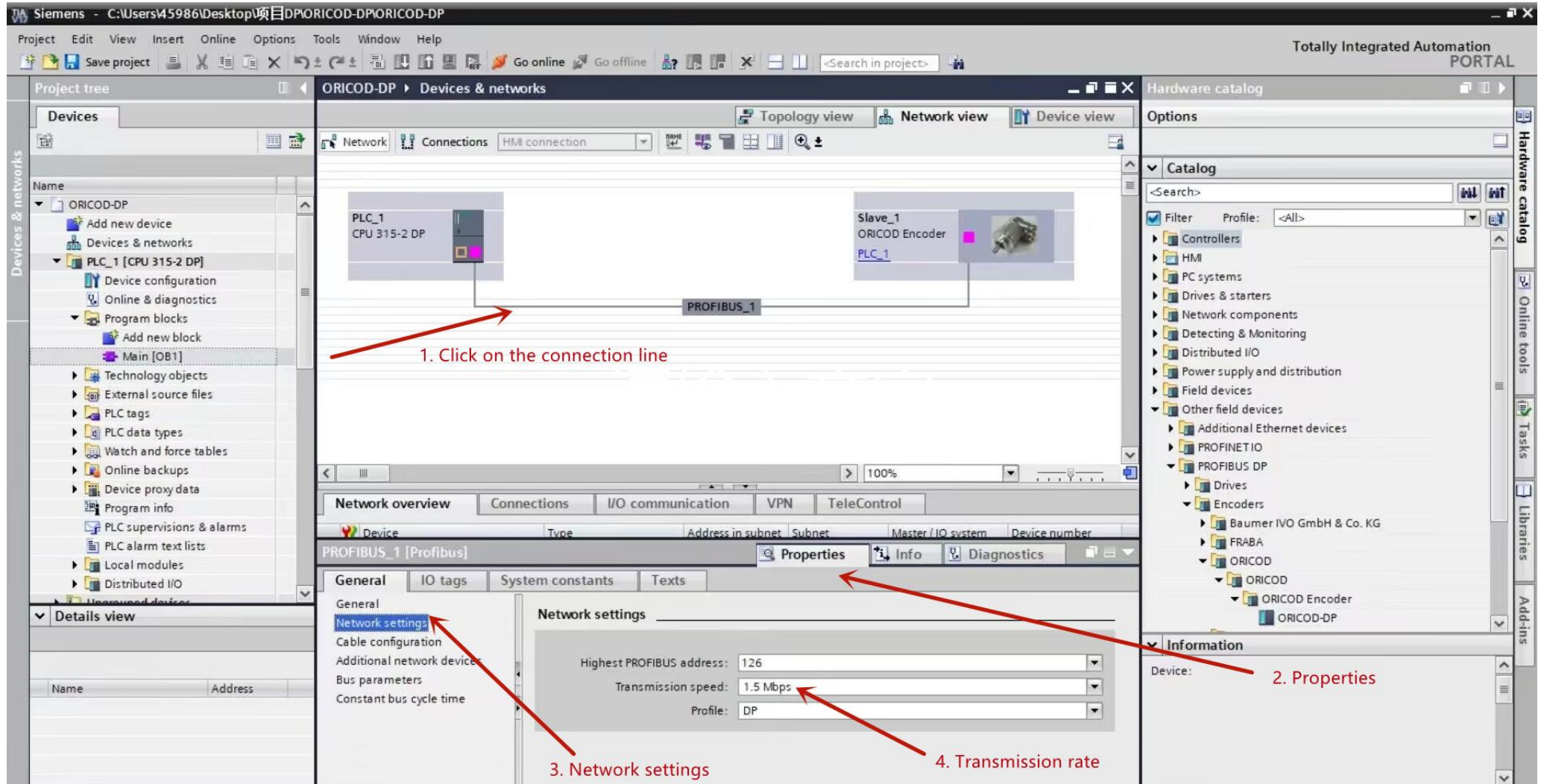


The screenshot displays the Siemens TIA Portal interface for a project named "ORICOD-DP". The main window shows a ladder logic program with three networks. Network 1 is labeled "Reading block" and contains a MOVE instruction that reads data from input "16#024E_11BC" (labeled "%D256:P" and "Tag_1") and outputs it to "16#024E_11BC" (labeled "%MD100" and "Tag_2"). Network 2 is labeled "Clear block" and contains a MOVE instruction that reads data from input "16#024E_11BC" (labeled "%M1.0" and "Tag_6") and outputs it to "16#024E_11BC" (labeled "%QD256:P" and "Tag_3"). Network 3 is empty. The right-hand side of the interface shows the "Testing" panel with options for CPU operator panel, Call environment, Breakpoints, PLC register, and Call hierarchy. The bottom status bar indicates "No call path available".

Reading block

Clear block
After clearing successfully, you need to restart the PLC to take effect

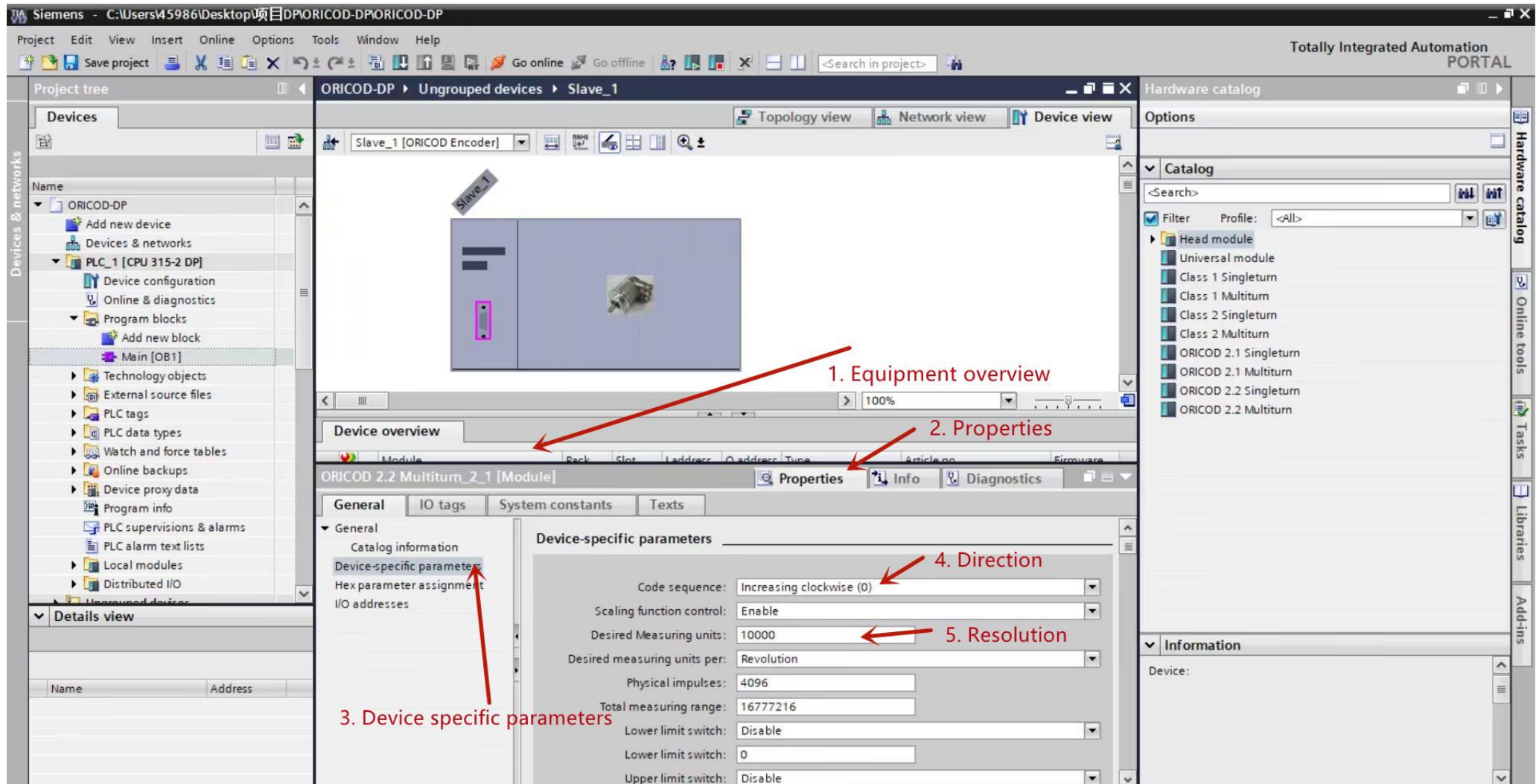
8: Baud rate setting



The screenshot shows the Siemens TIA Portal interface with the following components and annotations:

- Project tree (left):** Shows the project structure for 'ORICOD-DP'. The 'Main [OB1]' block is selected under 'Program blocks'.
- Network view (center):** Displays a network diagram with 'PLC_1 CPU 315-2 DP' and 'Slave_1 ORICOD Encoder' connected via 'PROFIBUS_1'. A red arrow points to the connection line with the text: "1. Click on the connection line".
- Properties window (bottom center):** The 'Properties' tab is active for 'PROFIBUS_1 [Profibus]'. The 'General' sub-tab is selected, showing 'Network settings'. A red arrow points to the 'Network settings' section with the text: "3. Network settings".
- Network settings (bottom center):** The 'Transmission speed' is set to '1.5 Mbps'. A red arrow points to this field with the text: "4. Transmission rate".
- Hardware catalog (right):** The 'Catalog' pane shows the 'PROFIBUS DP' section expanded. The 'ORICOD' folder is selected, and the 'ORICOD Encoder' device is highlighted. A red arrow points to the 'Properties' button in the 'Information' pane with the text: "2. Properties".

9: Modify the orientation and resolution:



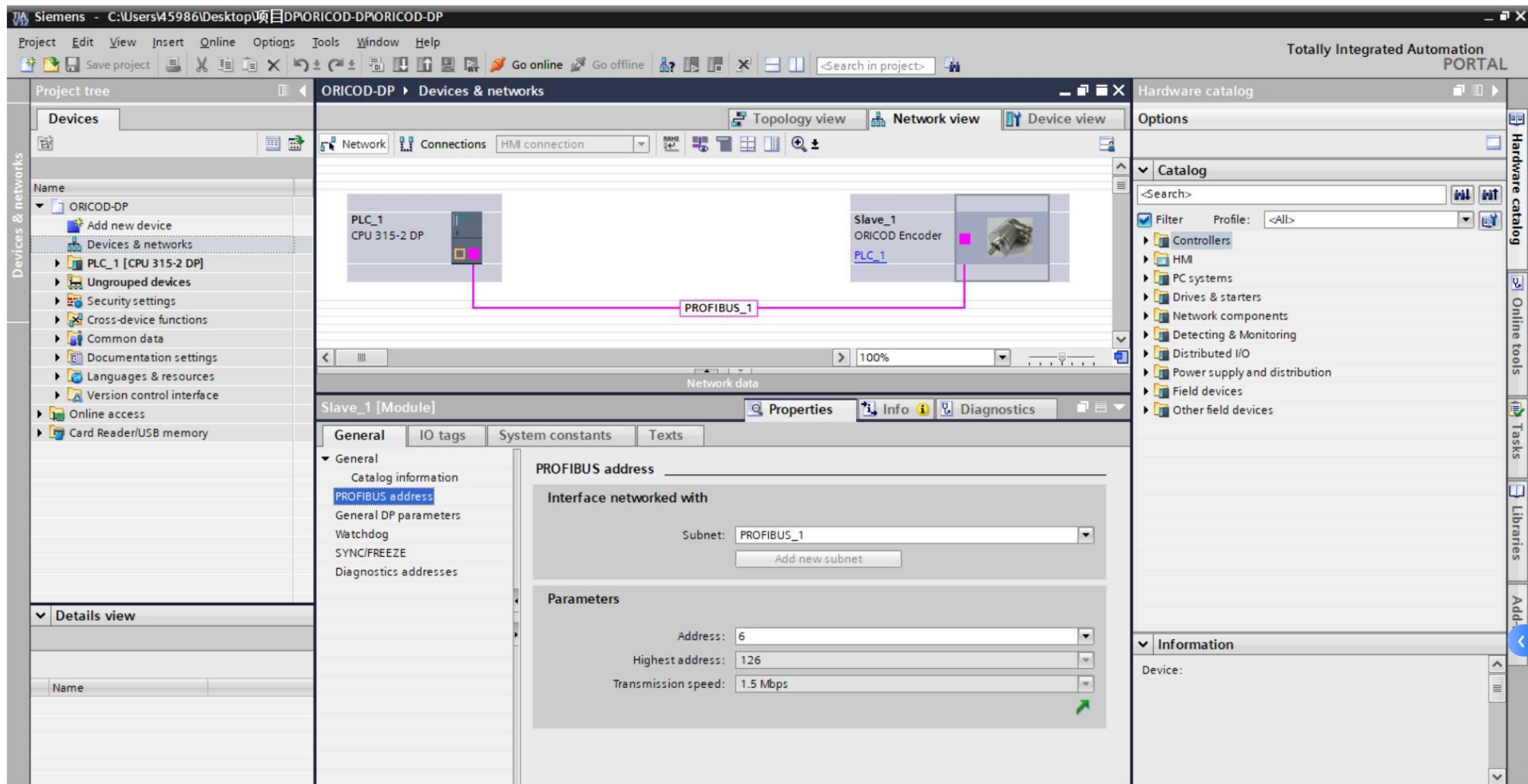
The screenshot displays the Siemens TIA Portal interface for configuring an ORICOD 2.2 Multiturn encoder. The interface is divided into several sections:

- Project tree (Left):** Shows the project structure, including 'Devices' and 'Unassigned devices'.
- Equipment overview (Top Center):** A visual representation of the rack and the encoder module.
- Device overview (Bottom Center):** A table showing the device configuration, including 'Module', 'Rack', 'Slot', 'Address', 'Q address', 'Type', 'Article no.', and 'Firmware'.
- Properties (Bottom Right):** A tabbed interface for configuring the device, including 'General', 'IO tags', 'System constants', and 'Texts'.
- Hardware catalog (Right):** A list of available hardware components, including 'Universal module', 'Class 1 Singleturn', 'Class 1 Multiturn', 'Class 2 Singleturn', 'Class 2 Multiturn', 'ORICOD 2.1 Singleturn', 'ORICOD 2.1 Multiturn', 'ORICOD 2.2 Singleturn', and 'ORICOD 2.2 Multiturn'.
- Information (Bottom Right):** A section for device-specific information, including 'Device:'.

Red arrows indicate the following steps for modifying the orientation and resolution:

- 1. Equipment overview:** Points to the top workspace area.
- 2. Properties:** Points to the 'Properties' tab in the device overview.
- 3. Device specific parameters:** Points to the 'Device-specific parameters' section in the left pane.
- 4. Direction:** Points to the 'Code sequence' dropdown menu, which is set to 'Increasing clockwise (0)'.
- 5. Resolution:** Points to the 'Desired Measuring units' field, which is set to '10000'.

9: Encoder address:



The screenshot displays the Siemens TIA Portal interface for configuring a sensor network. The main workspace shows a network diagram with a PLC_1 (CPU 315-2 DP) and a Slave_1 (ORICOD Encoder) connected via a PROFIBUS_1 network. The 'Properties' window for the Slave_1 module is open, showing the 'PROFIBUS address' configuration.

PROFIBUS address configuration:

- Interface networked with:** Subnet: PROFIBUS_1
- Parameters:**
 - Address: 6
 - Highest address: 126
 - Transmission speed: 1.5 Mbps