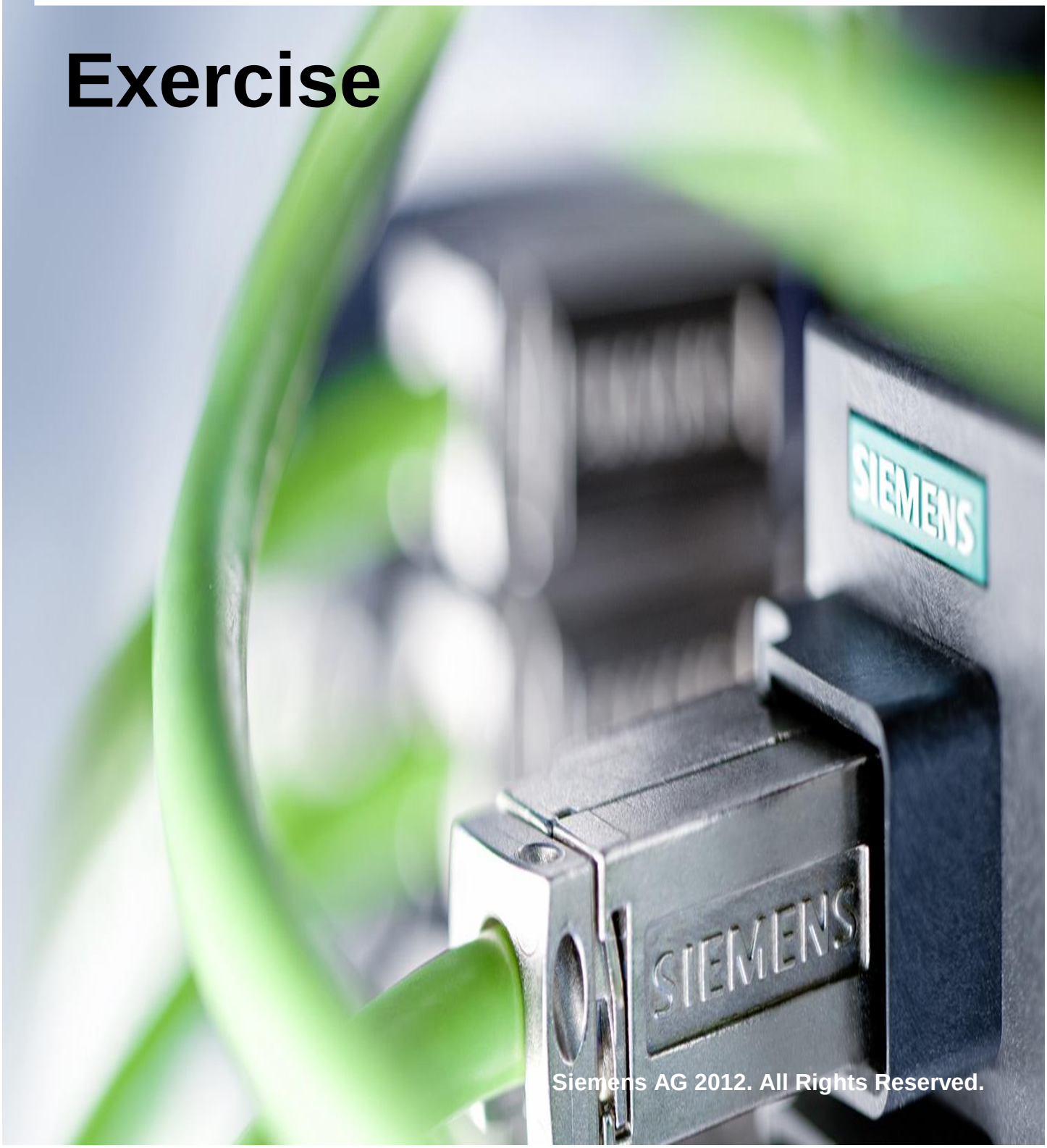
SIEMENS

Exercise



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Exercise 1

PROFINET IO System
Engineering with STEP7 V5.5

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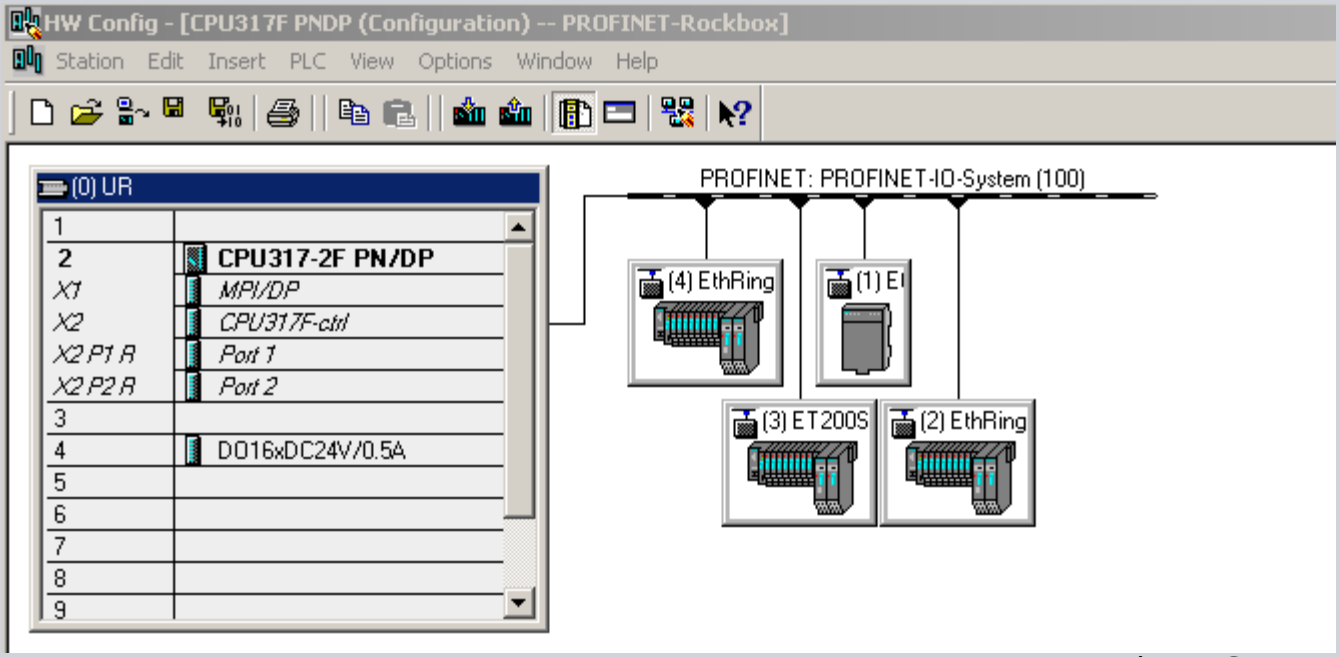
Exercise 1:
PROFINET

1. Create Project in STEP7 V5.5
2. Create HW-Config
3. Assign IP Address on PC and CPU
4. Test the connection with Ping Function
5. Insert IO-Devices from your Training Kit (ET200S, SCALANCE X)
6. Define and assign Device Names
7. Copy Error OBs
8. Download and test
9. Configure Topology



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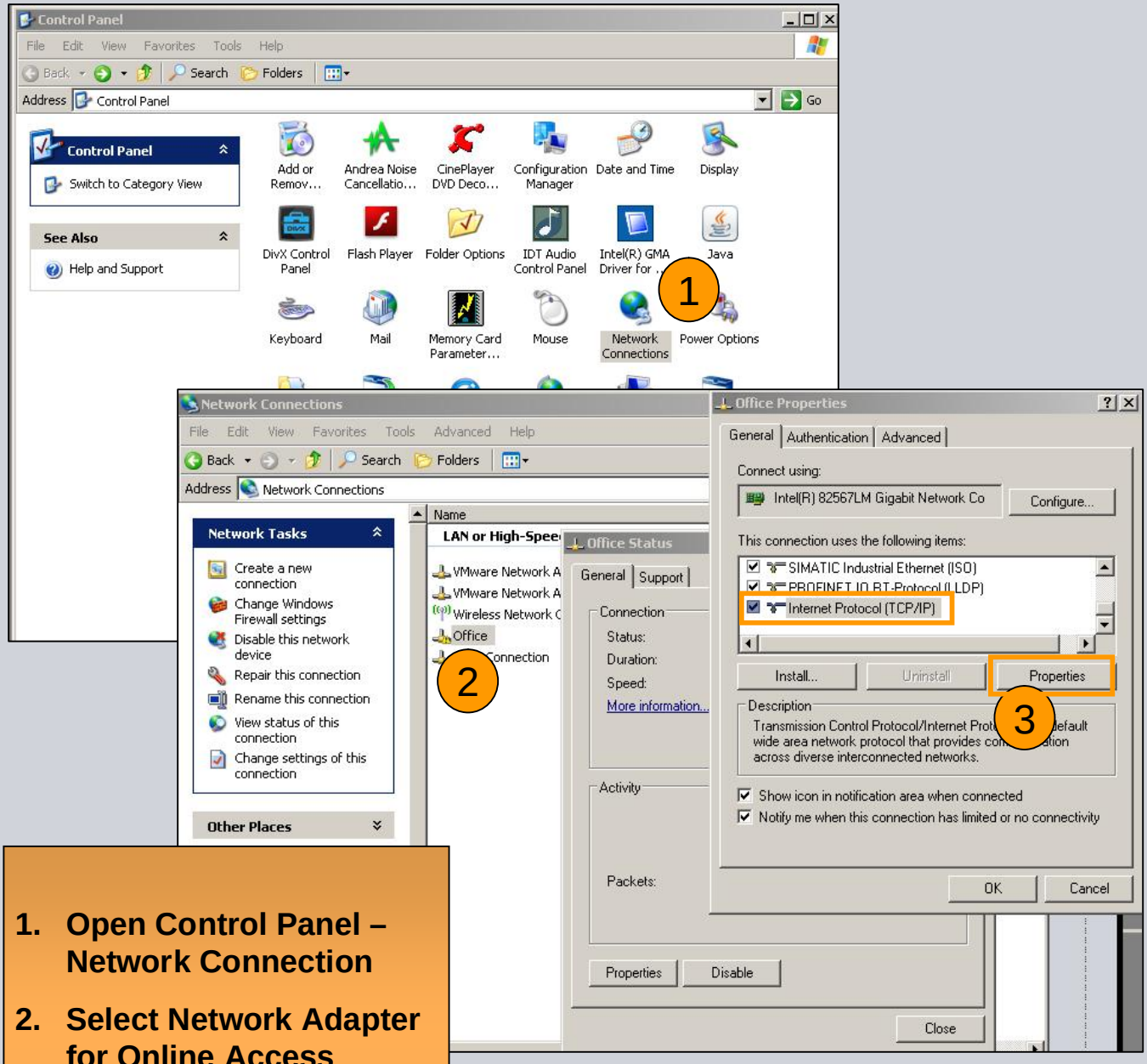
Exercise 1:
Assign IP-Address



1. **Open Control Panel – Network Connection**
2. **Select Network Adapter for Online Access**
3. **Open Up Properties for TCP/IP Protocol**

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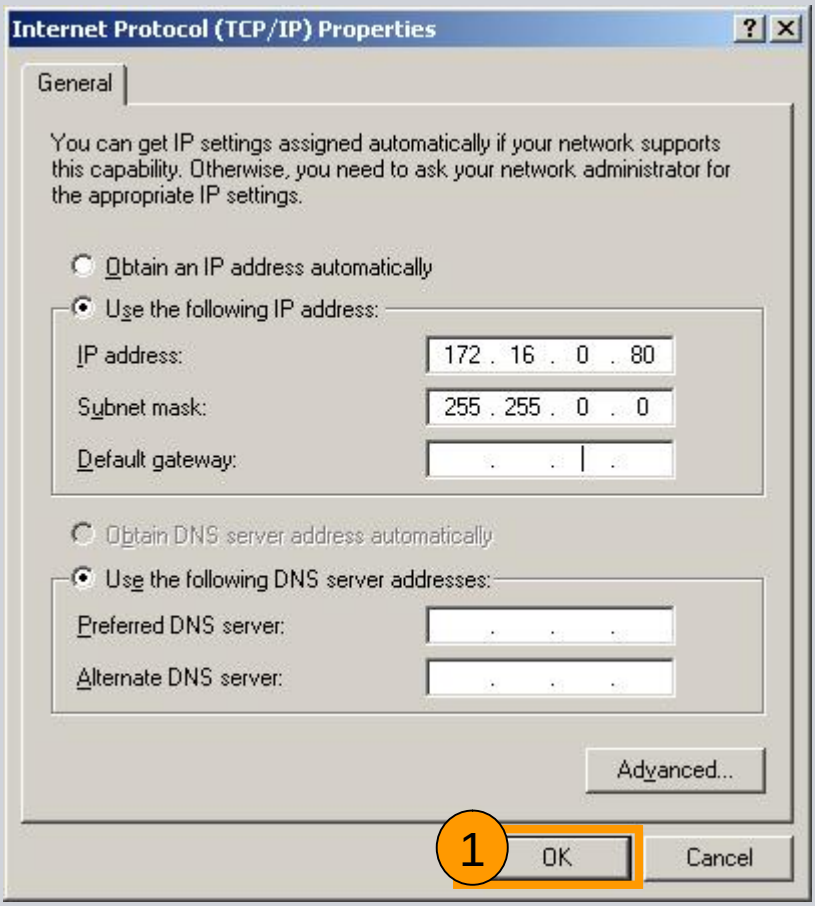
Exercise 1:
Assign IP-Address



Three Network Classes:

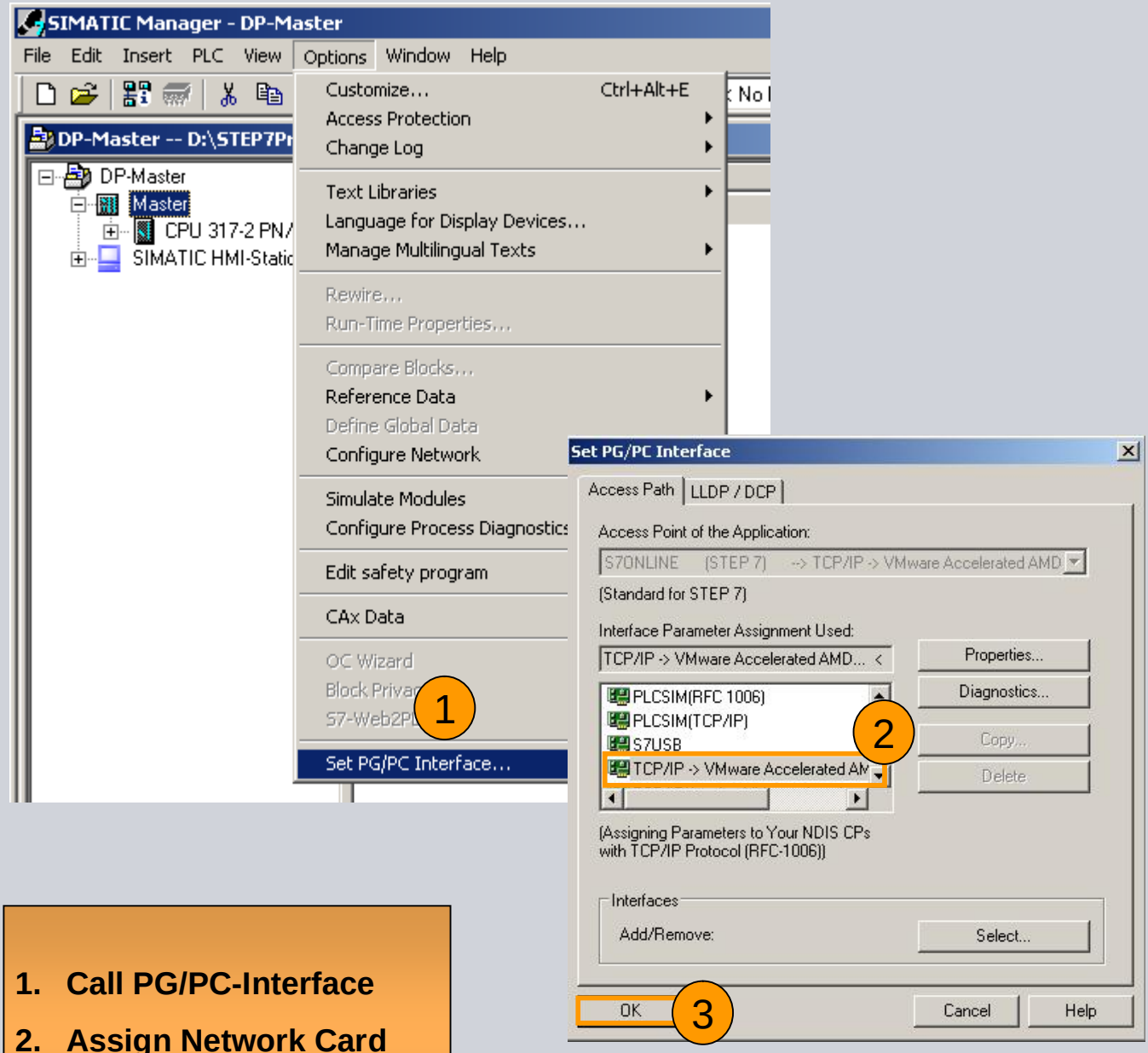
Class A: 1.0 - 127.0
Subnet: 255.0.0.0

Class B: 128.0-191.255
Subnet: 255.255.0.0

Class C: 192.0-223.255.255
Subnet: 255.255.255.0

1. **Assign IP-Address for the Network Adapter.**
2. **Notice to make sure addresses are correct for the sub network, IP-Address needs to be unique!**

Exercise 1:
Assign IP-Address



1. **Call PG/PC-Interface**
2. **Assign Network Card**
3. **OK**

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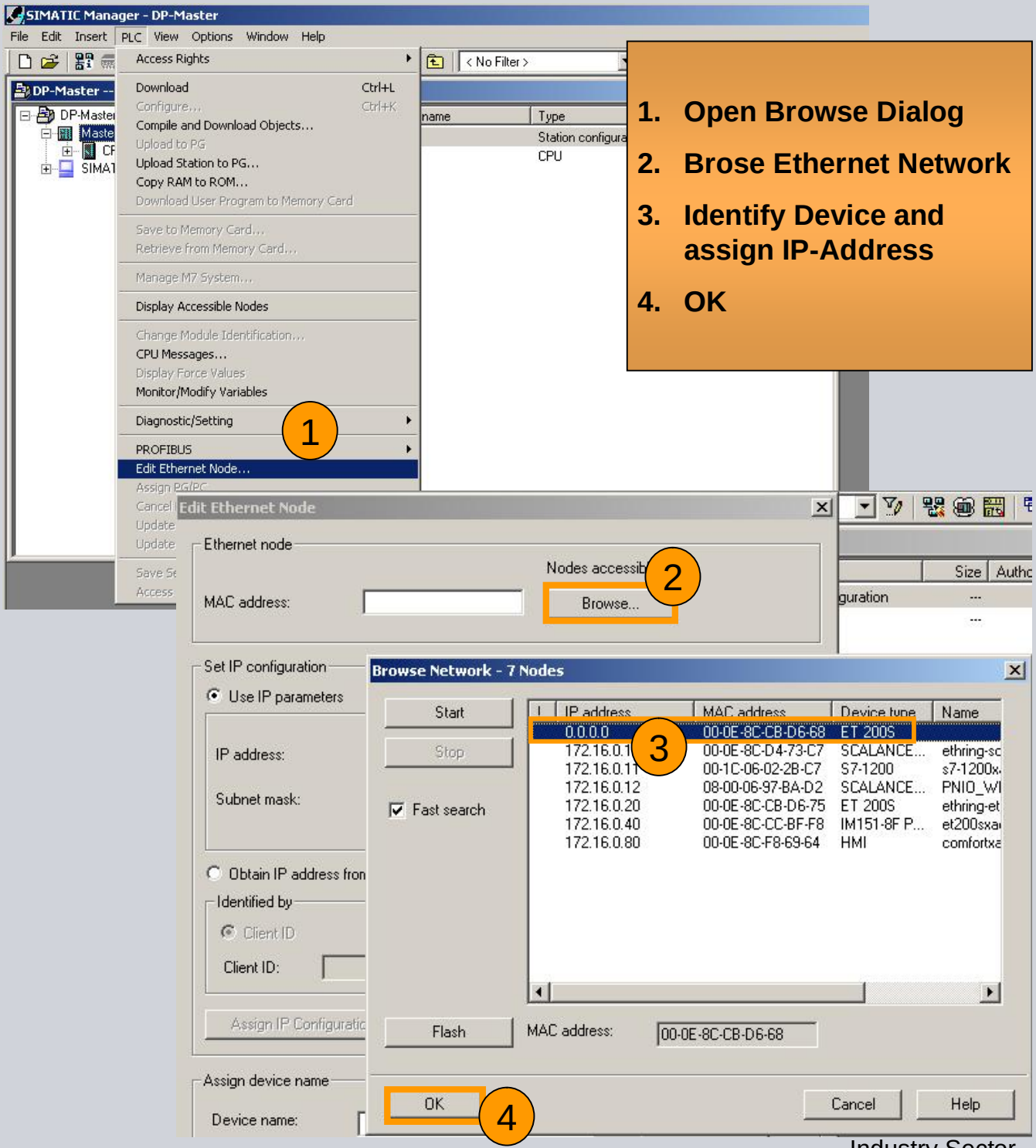
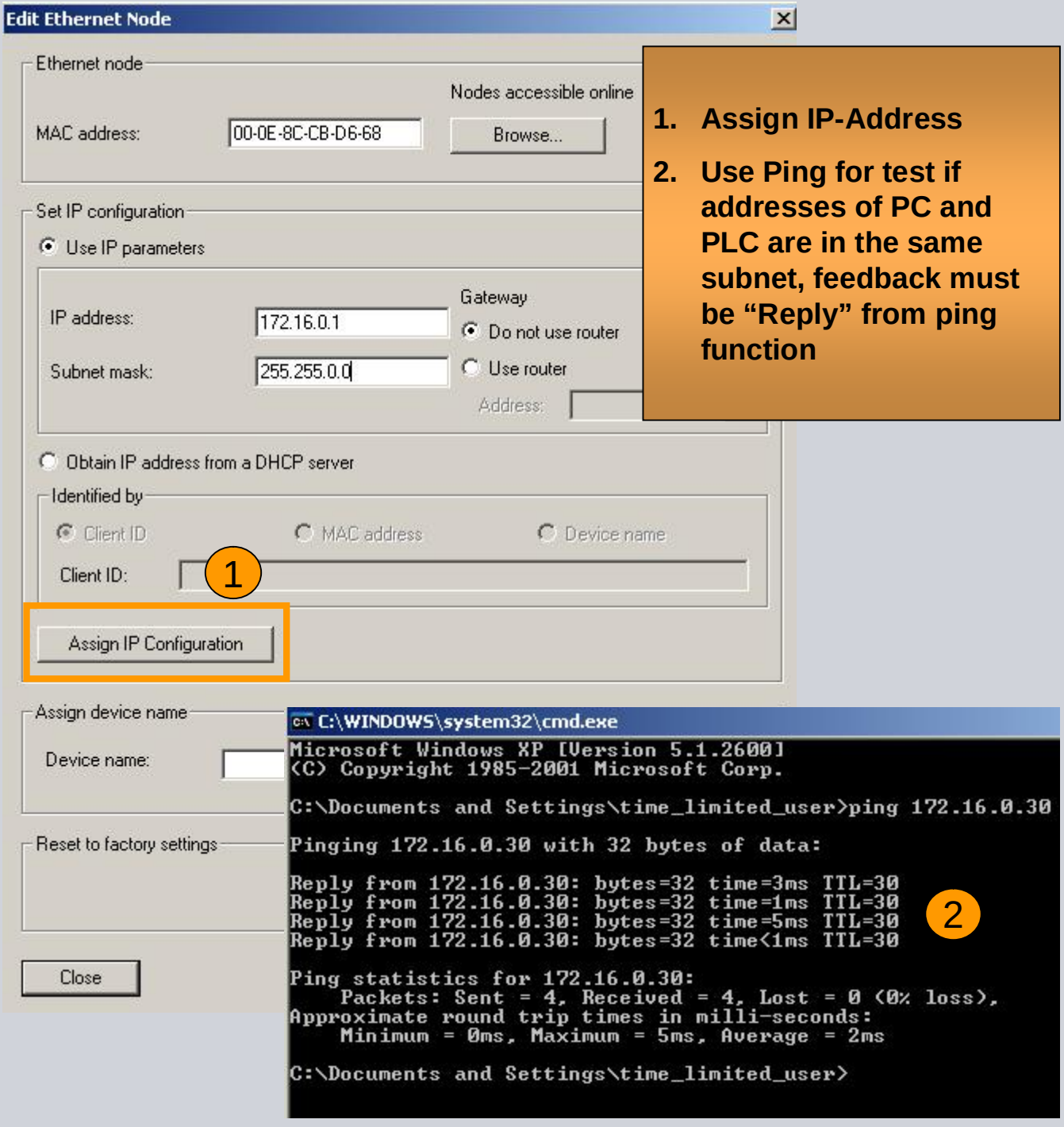
Exercise 1:
Assign IP-Address

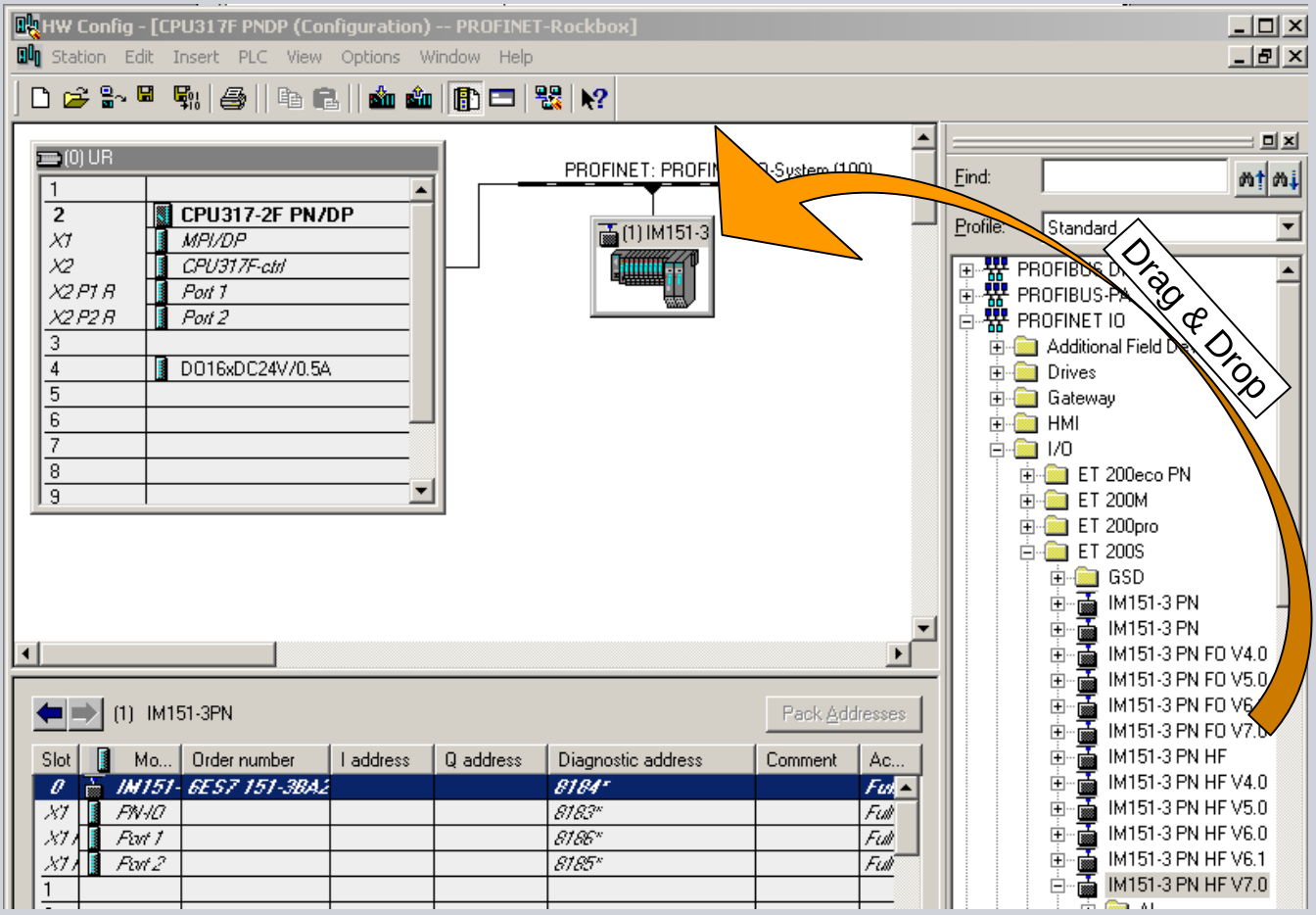


Exercise 1:
Assign IP-Address



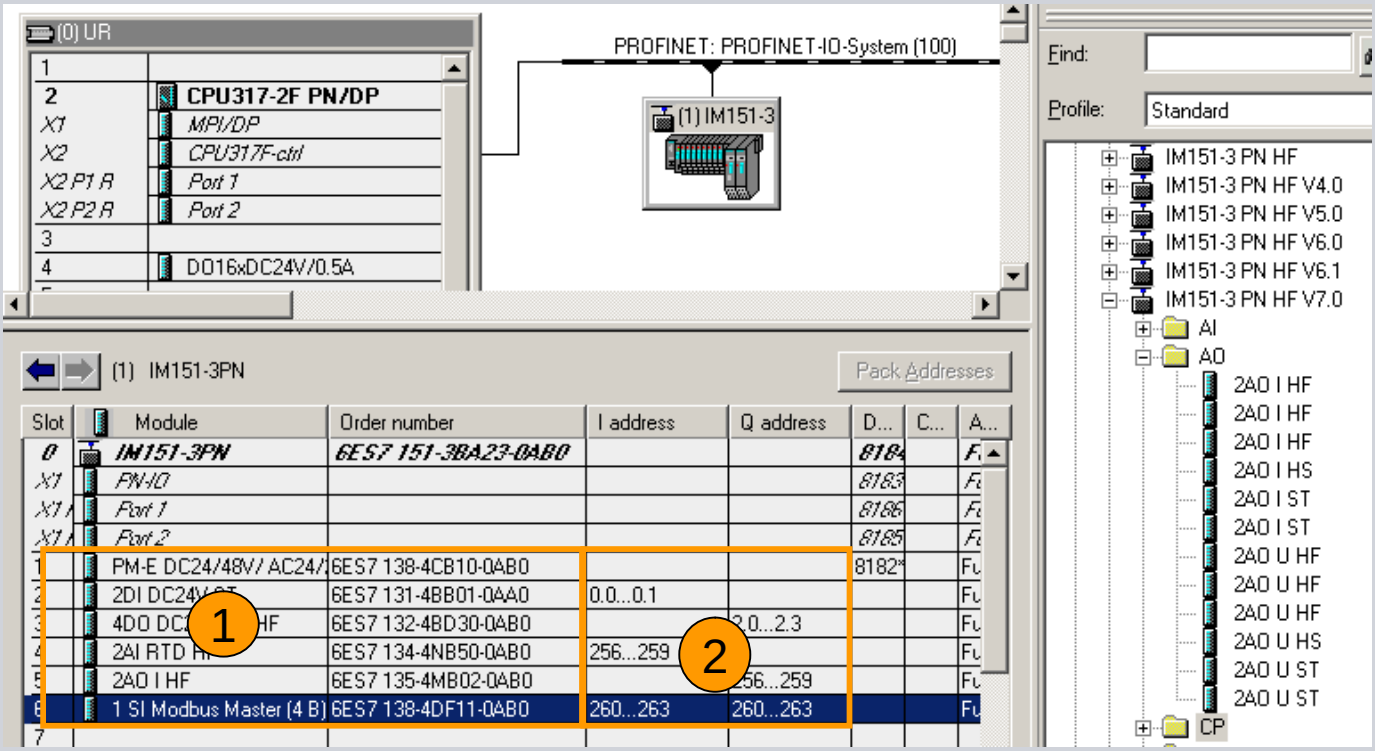
1. **Assign IP-Address**
2. **Use Ping for test if addresses of PC and PLC are in the same subnet, feedback must be “Reply” from ping function**

Exercise 1:
PROFINET



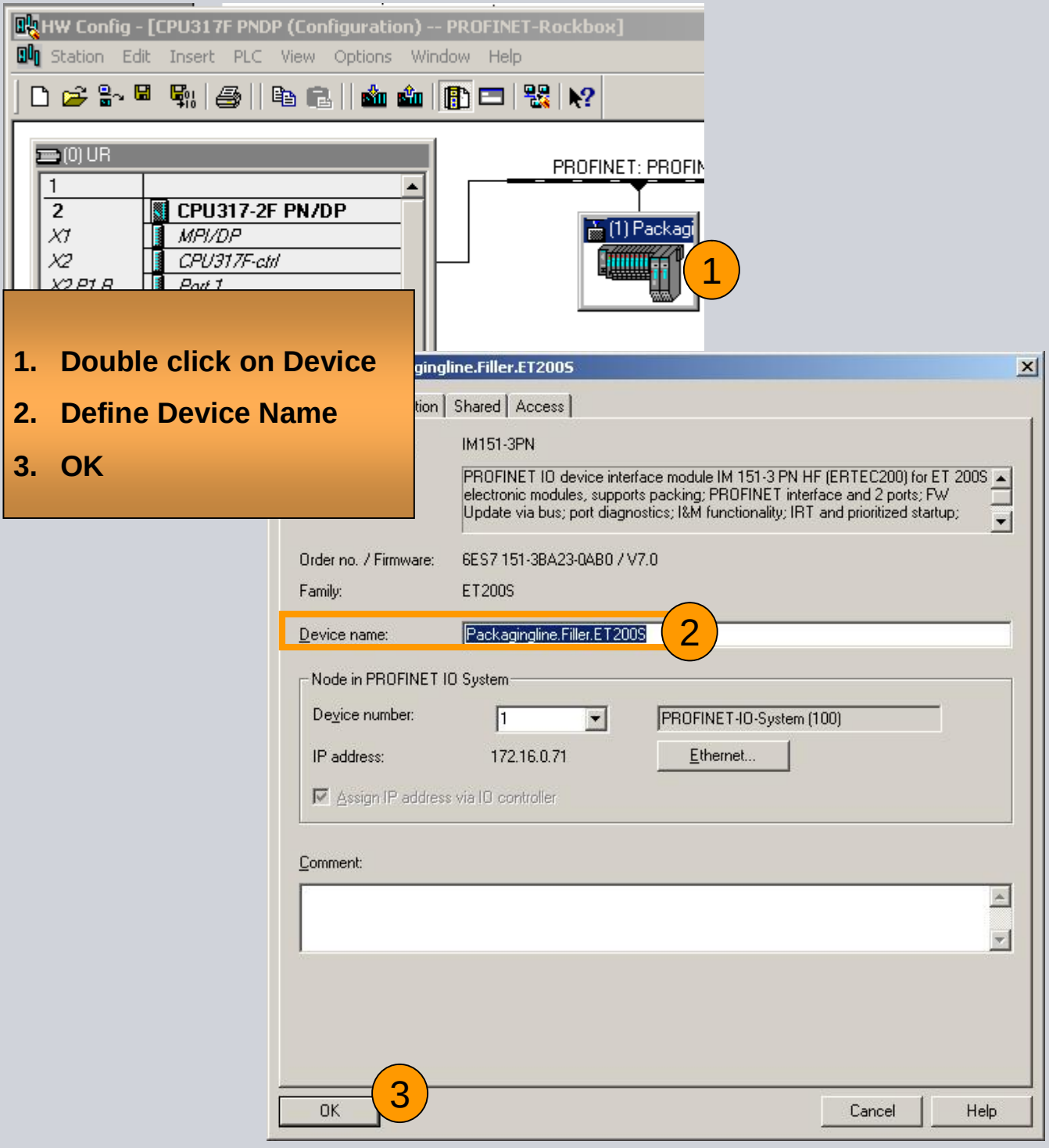
SIEMENS

Exercise 1:
PROFINET



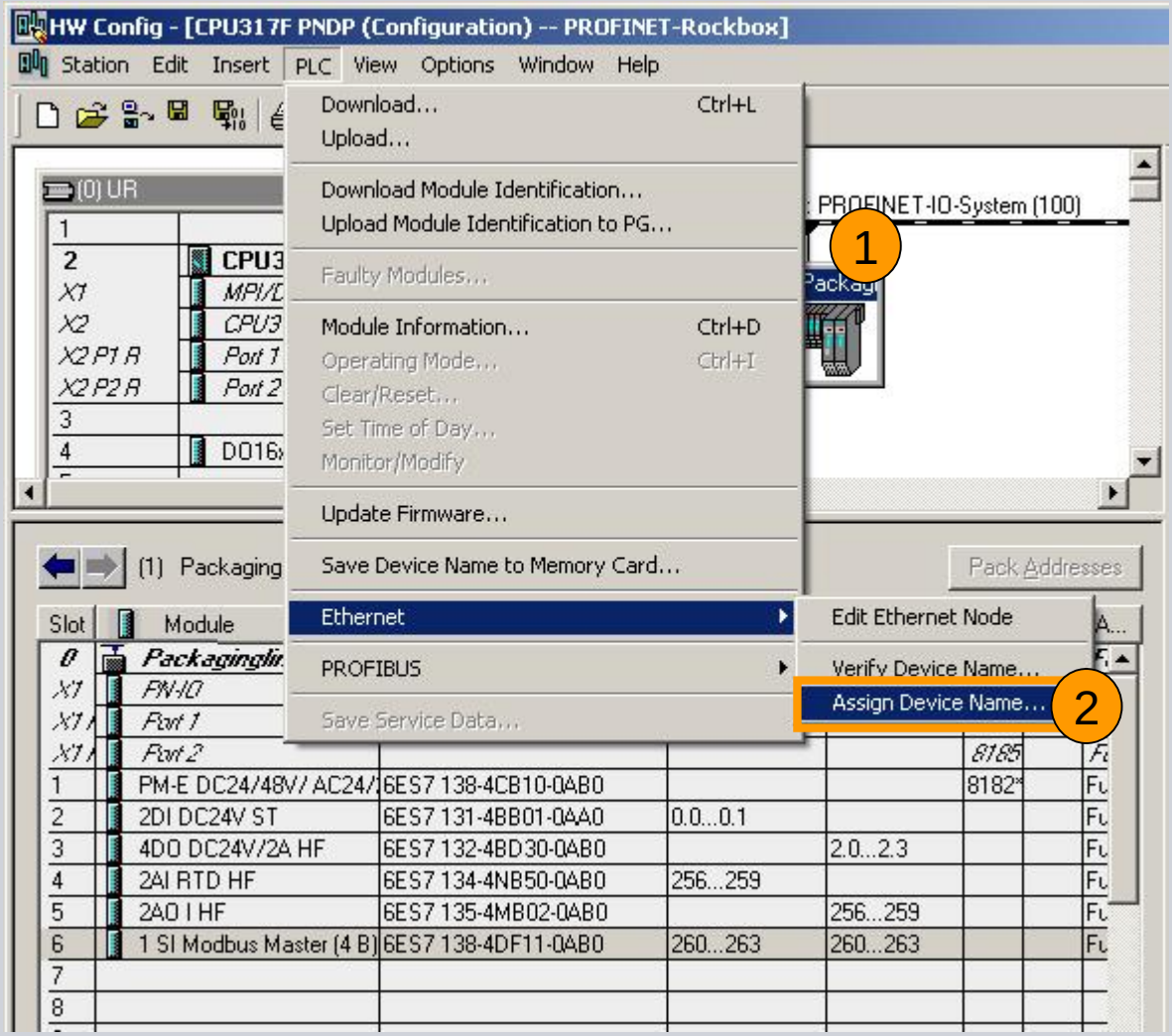
1. **Select Device and configure IOs according to the real setup**
2. **IO-Address, access from User program**

Exercise 1:
PROFINET



SIEMENS

Exercise 1:
PROFINET



1. **Select IO-System or IO-Device**
2. **Call “Assign Device Name” Dialog**

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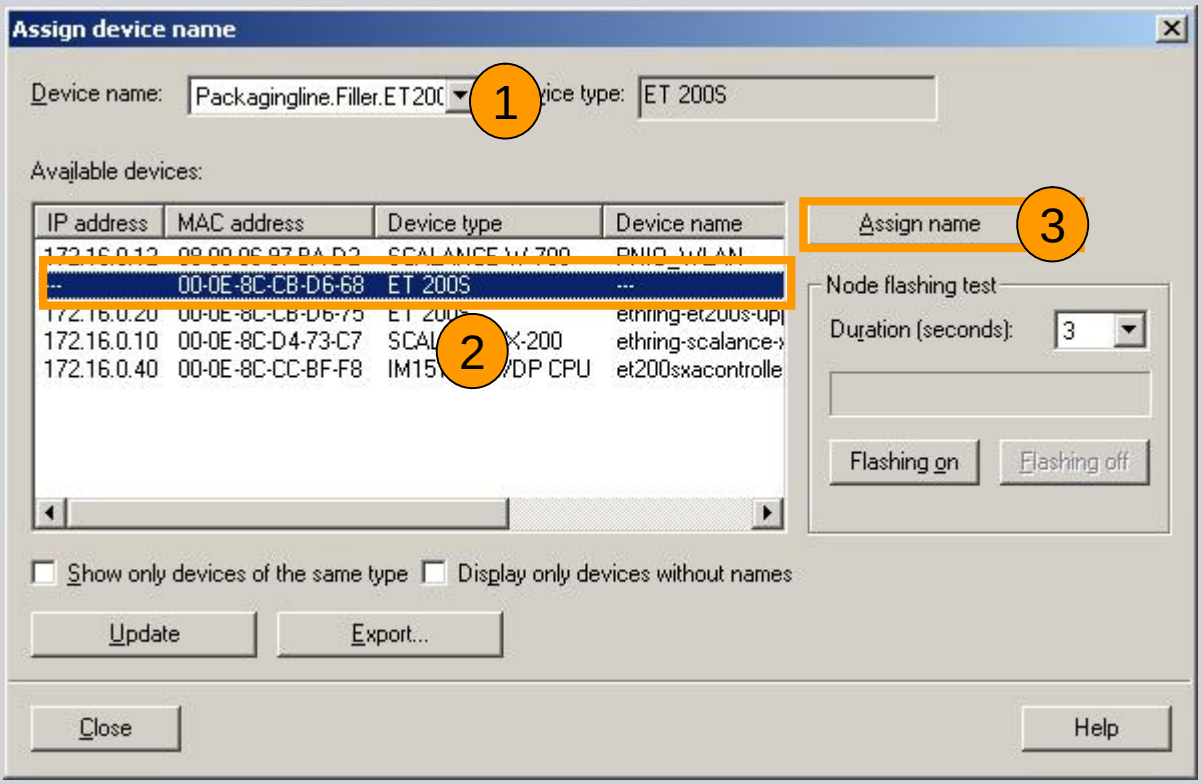
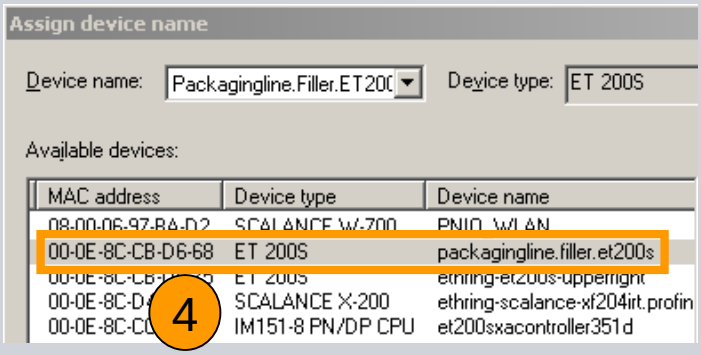
Exercise 1:
PROFINET

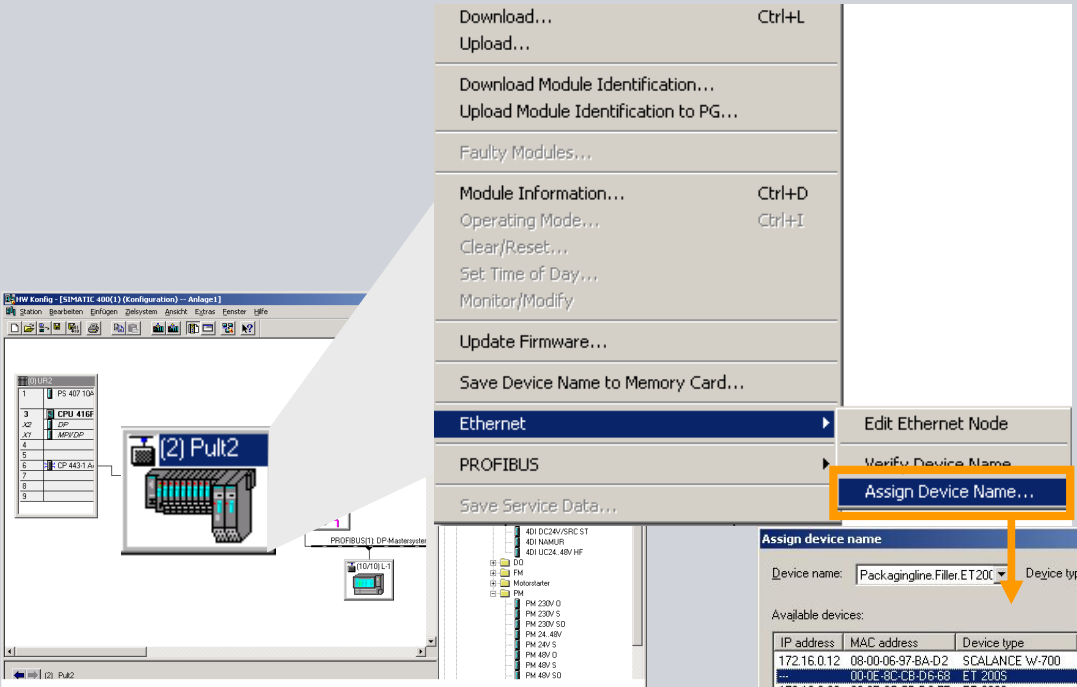


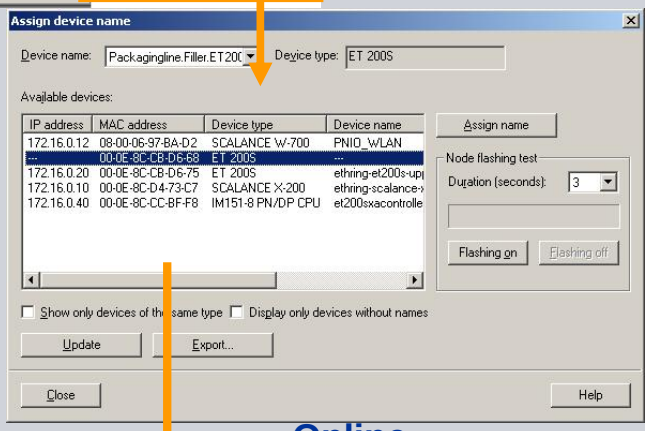


1. **Select Device name**
2. **Select Online Device**
3. **Assign Name**
4. **After click “Assign Name” the Device receives the Name.**
5. **IP-Address will be set by the IO-Controller and the connection will be established automatically**

Exercise 1:
PROFINET

SIEMENS





Offline configuration

- Every device receives a device name (e.g. sample2) 1
- STEP 7 automatically assigns a IP-Address in the Configuration

Online:
Write the device name to the device

2

IO-Controller

3

Start up:
IO-Controller assigns the device an IP-address

MAC Adr 1

MAC Adr 2

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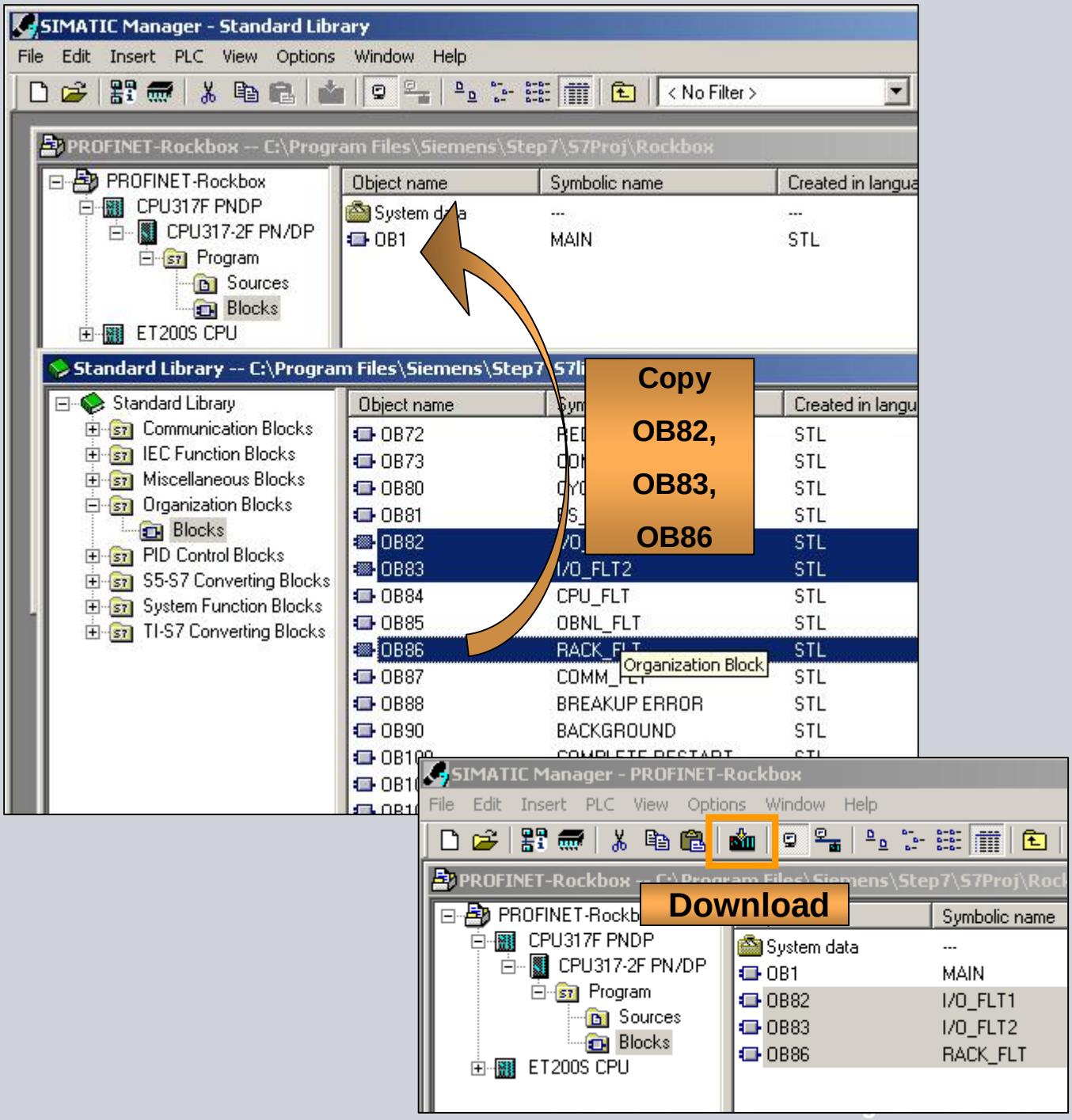
Exercise 1:
PROFINET



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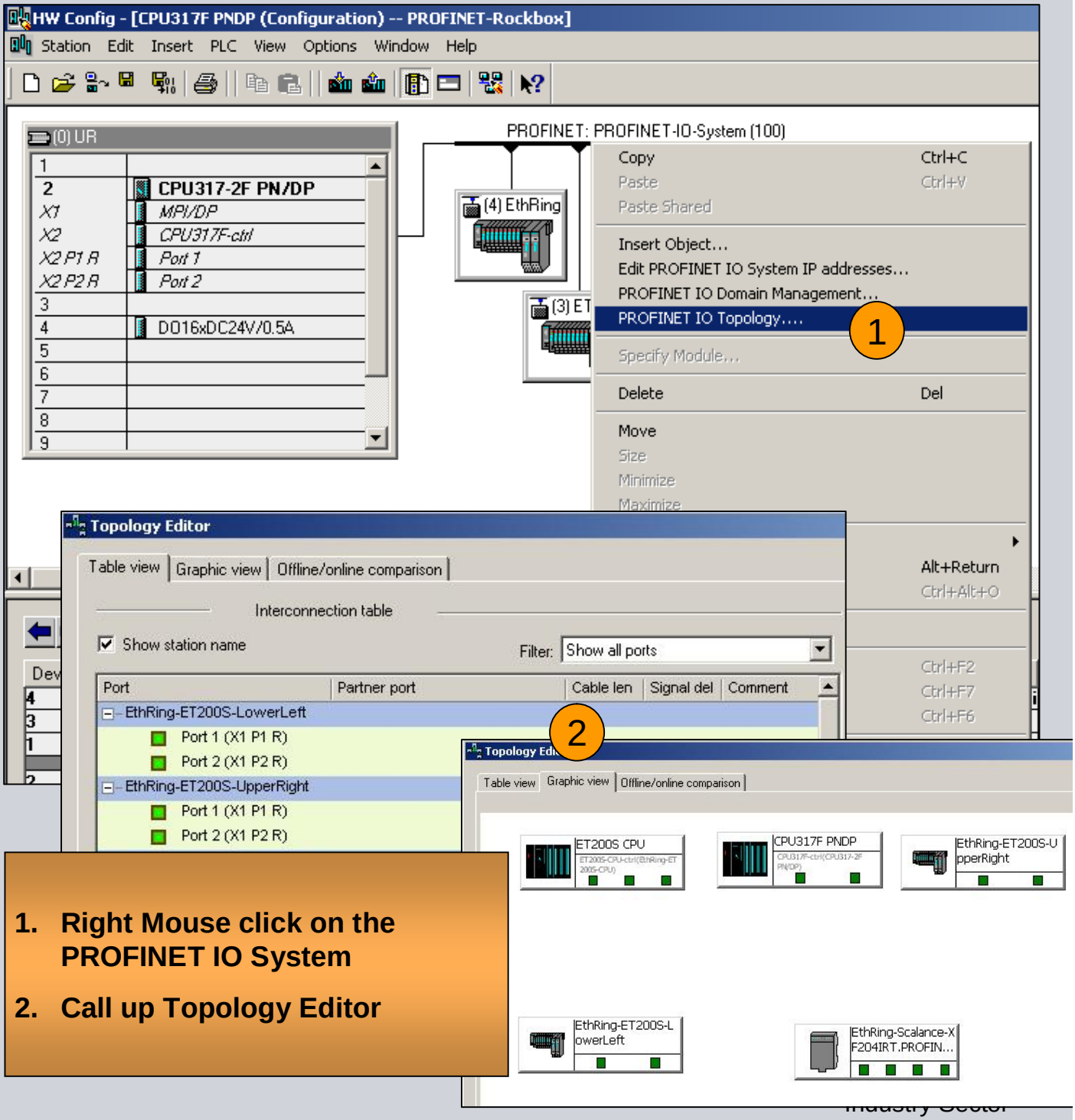
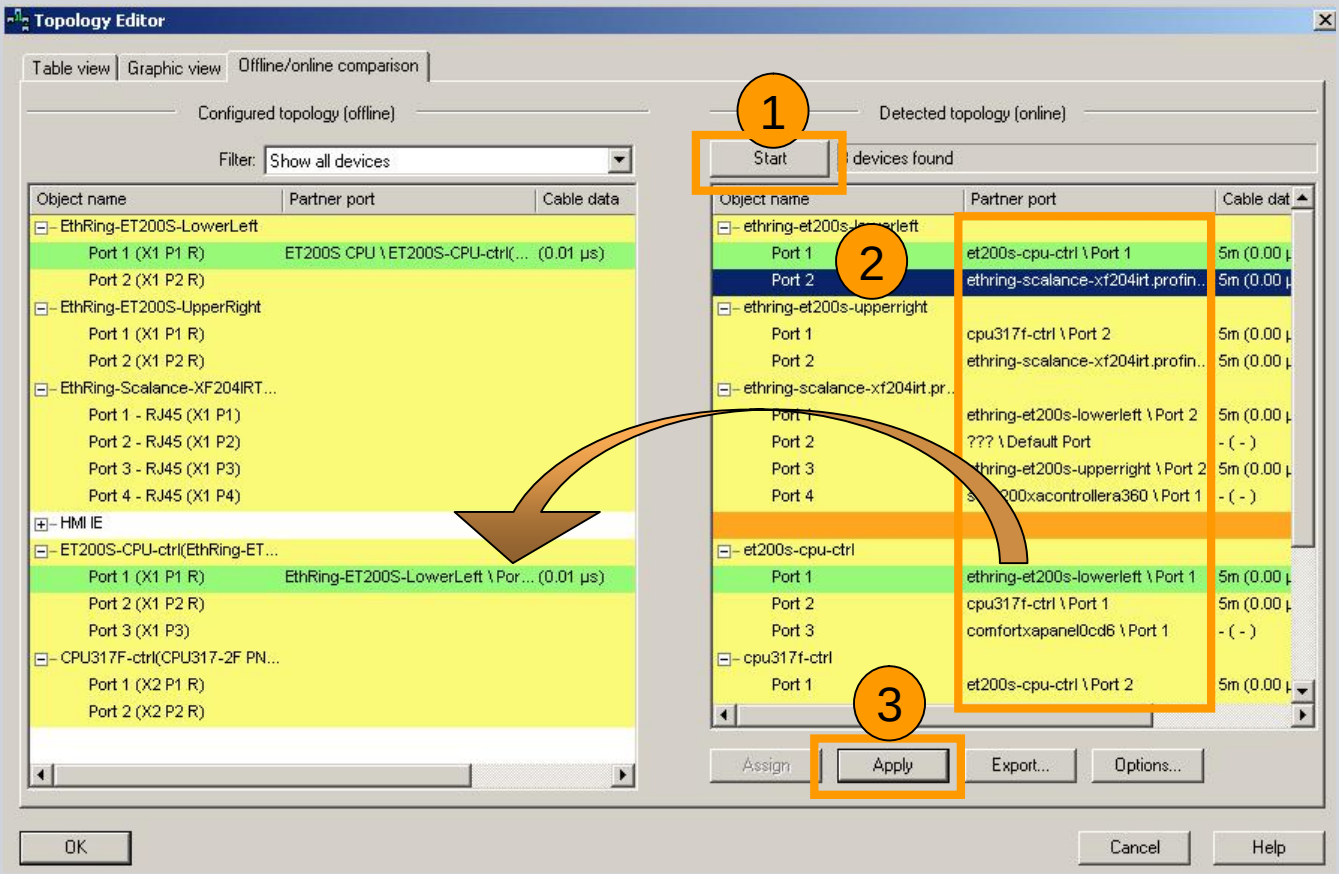
Exercise 1:
Topology



1. **Right Mouse click on the PROFINET IO System**
2. **Call up Topology Editor**

Exercise 1:
Topology



1. **Start Network Detection**
2. **Select Ports**
3. **Apply Online Detection to your Offline Configuration**

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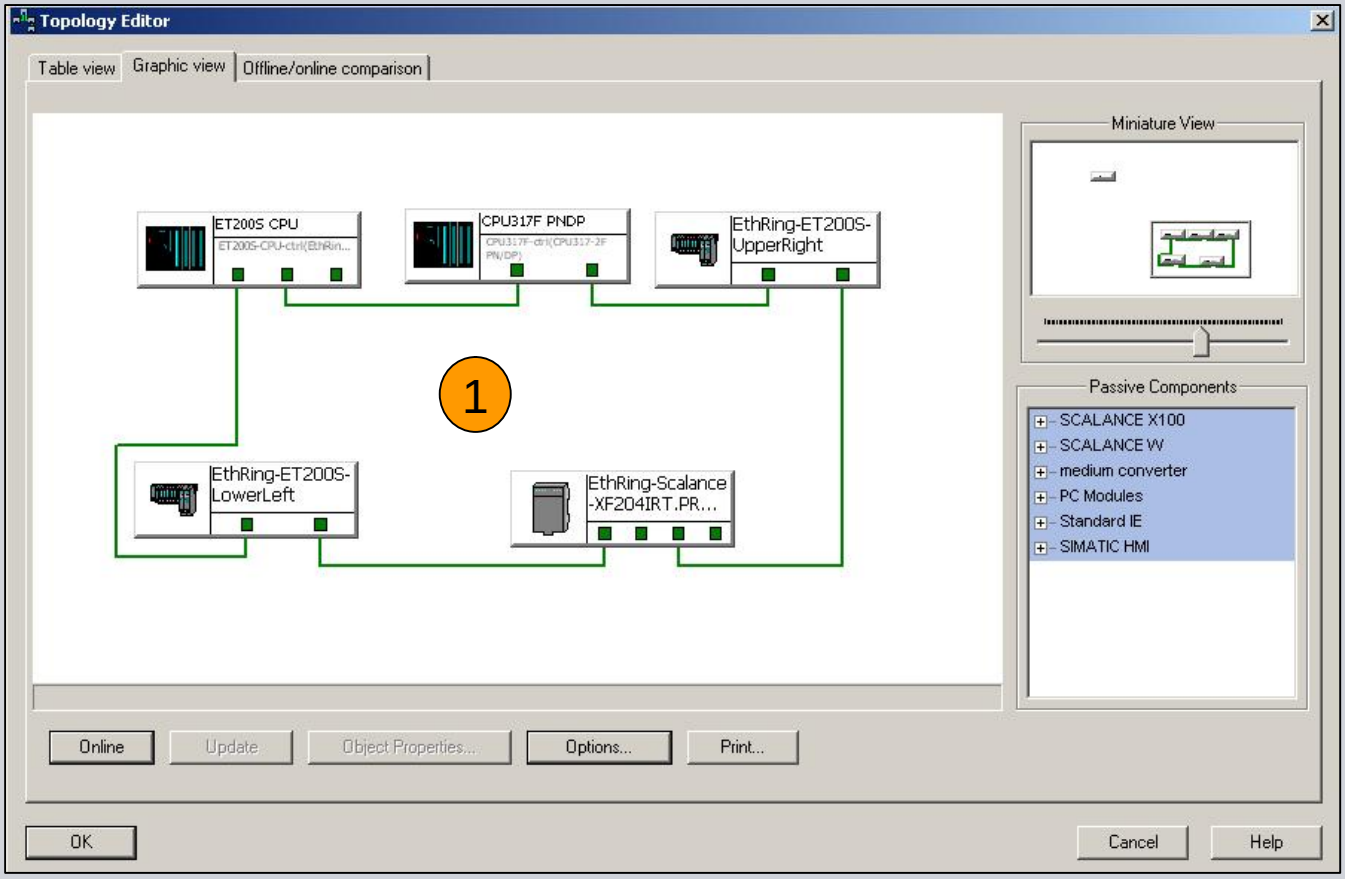
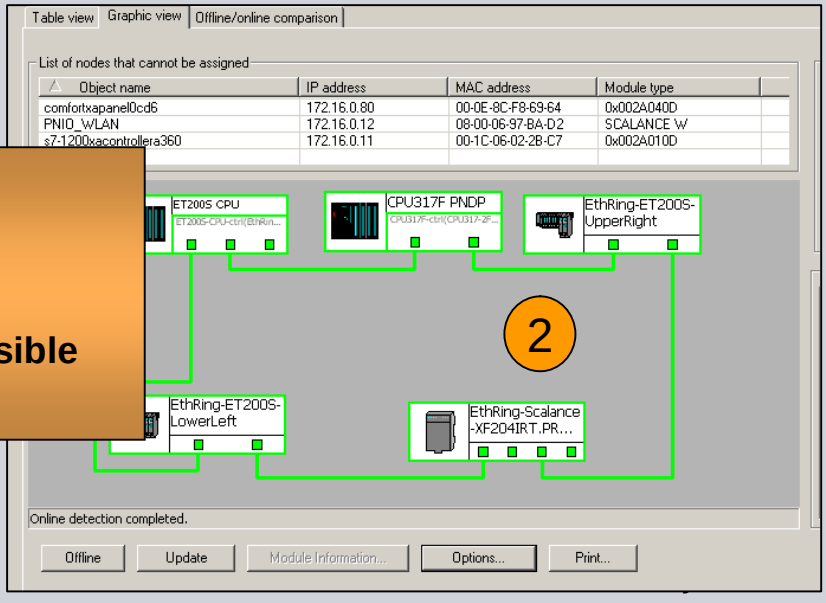
Exercise 1:
Topology





1. **Interconnections are automatically created**
2. **Online Diagnostic is possible**

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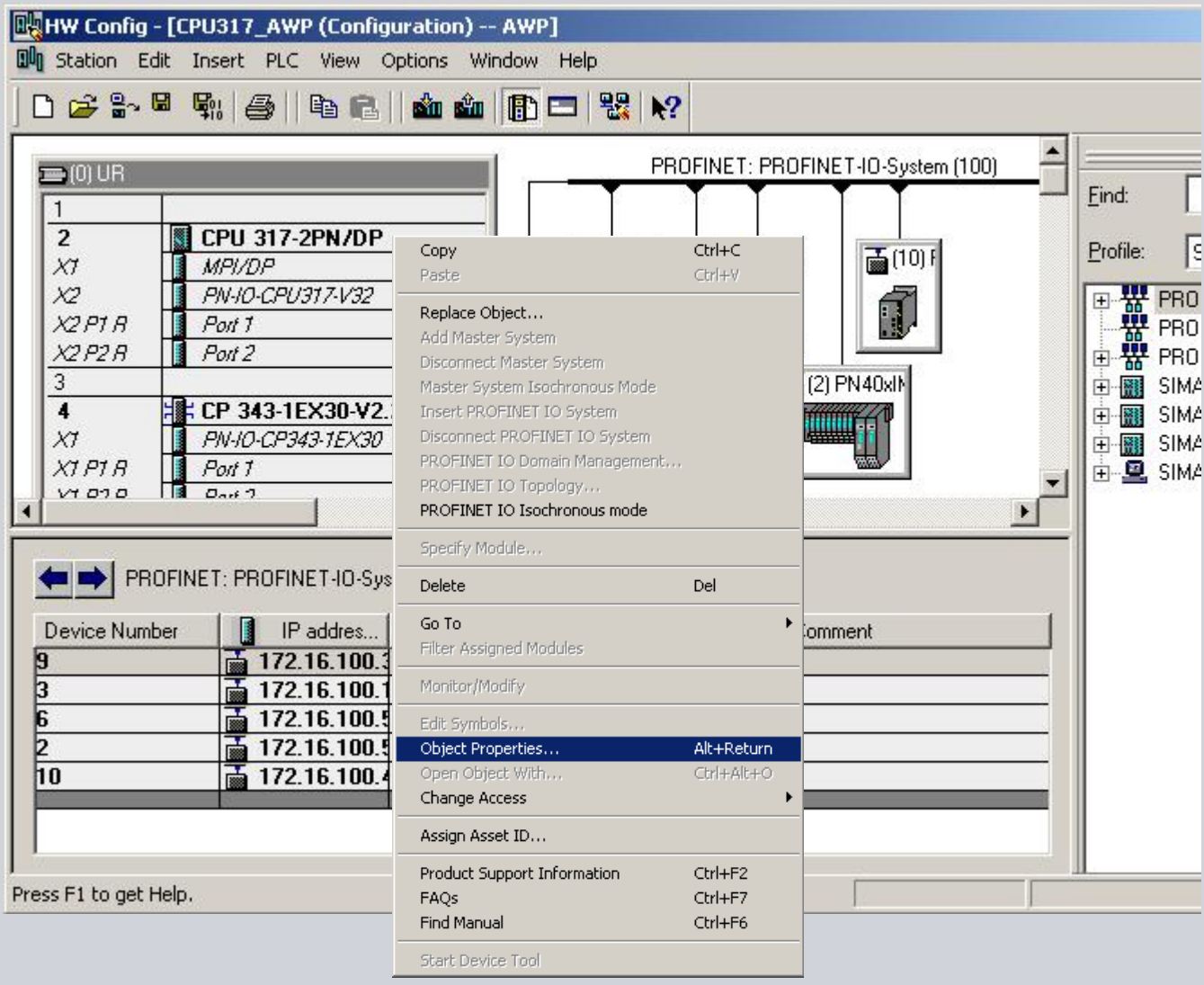
Exercise

Exercise 2

Webinterface

SIEMENS

Exercise 2:
Web function



1. Call up Object Properties of the S7-PLC

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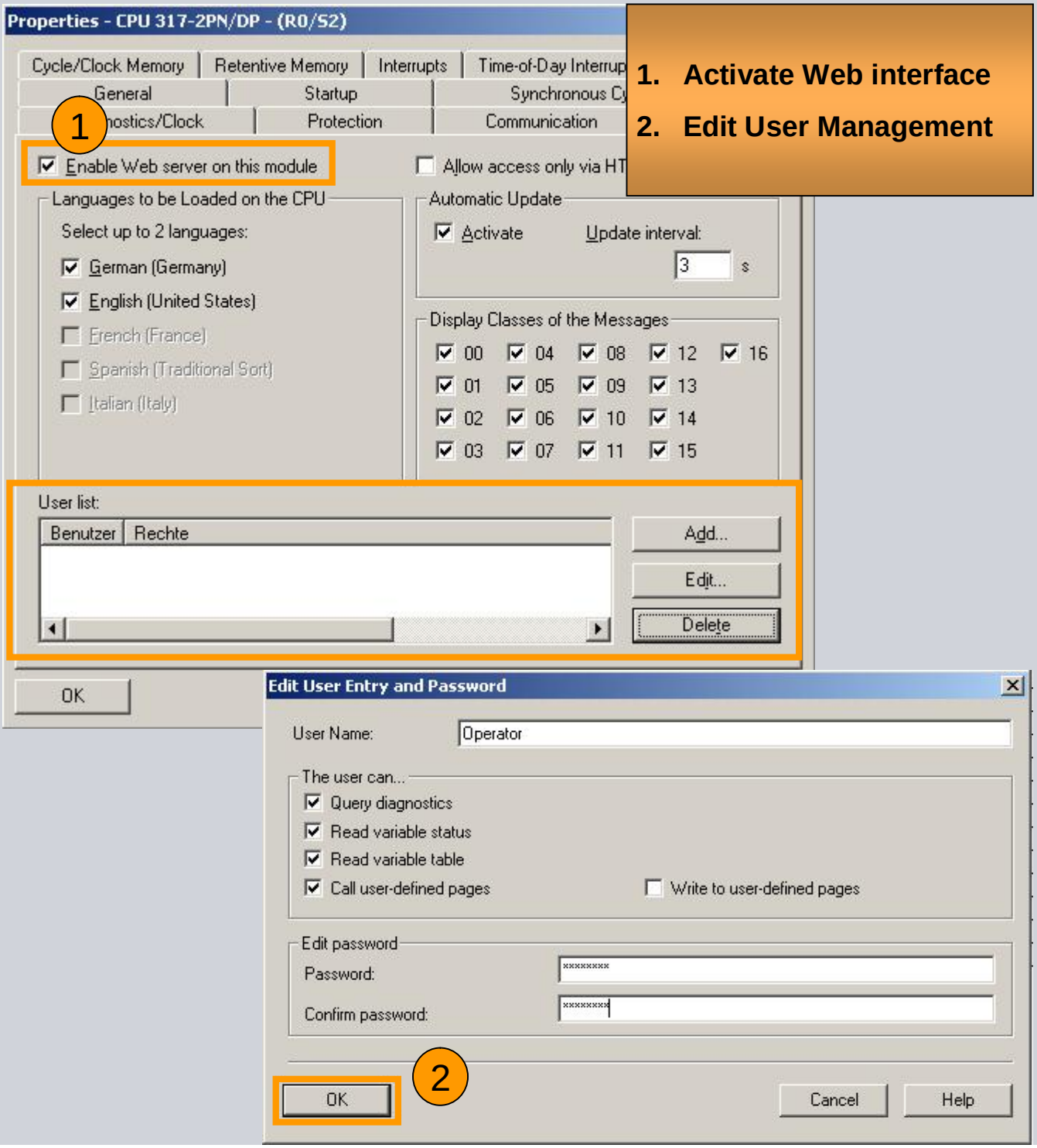
Exercise 2:
Web function

1. **Activate Web interface**
2. **Edit User Management**



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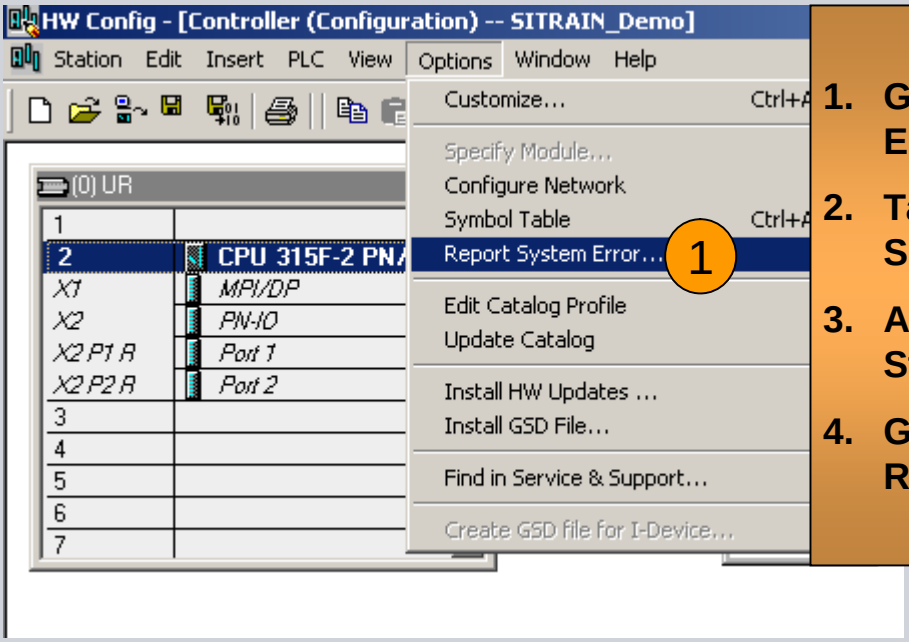
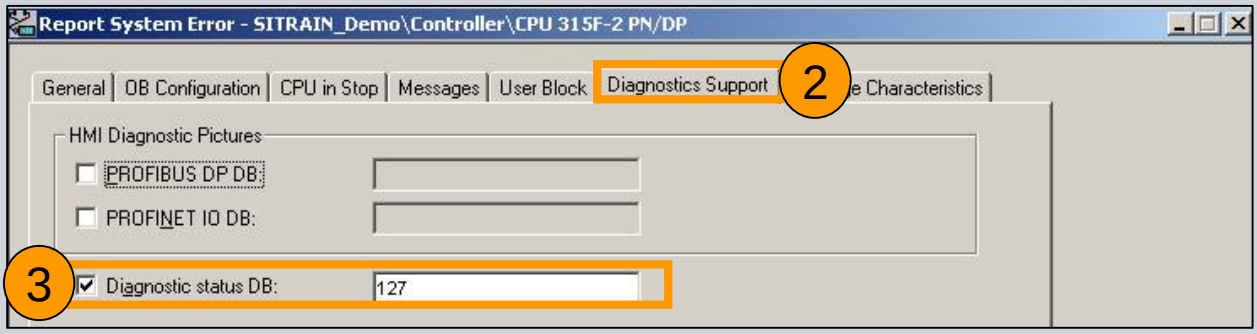
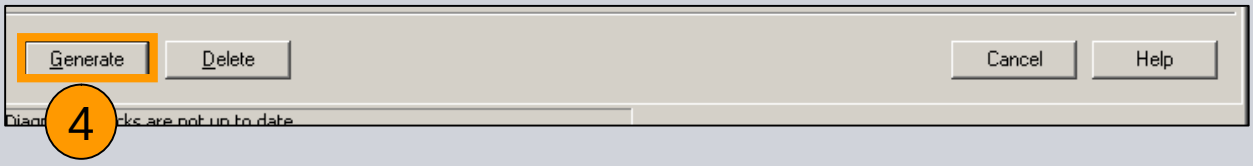
Exercise 2:
Web function



1. **Goto Report System Error**
2. **Tab “Diagnostic Support”**
3. **Activate “Diagnostic Status DB”**
4. **Generate and download RSE one more time**





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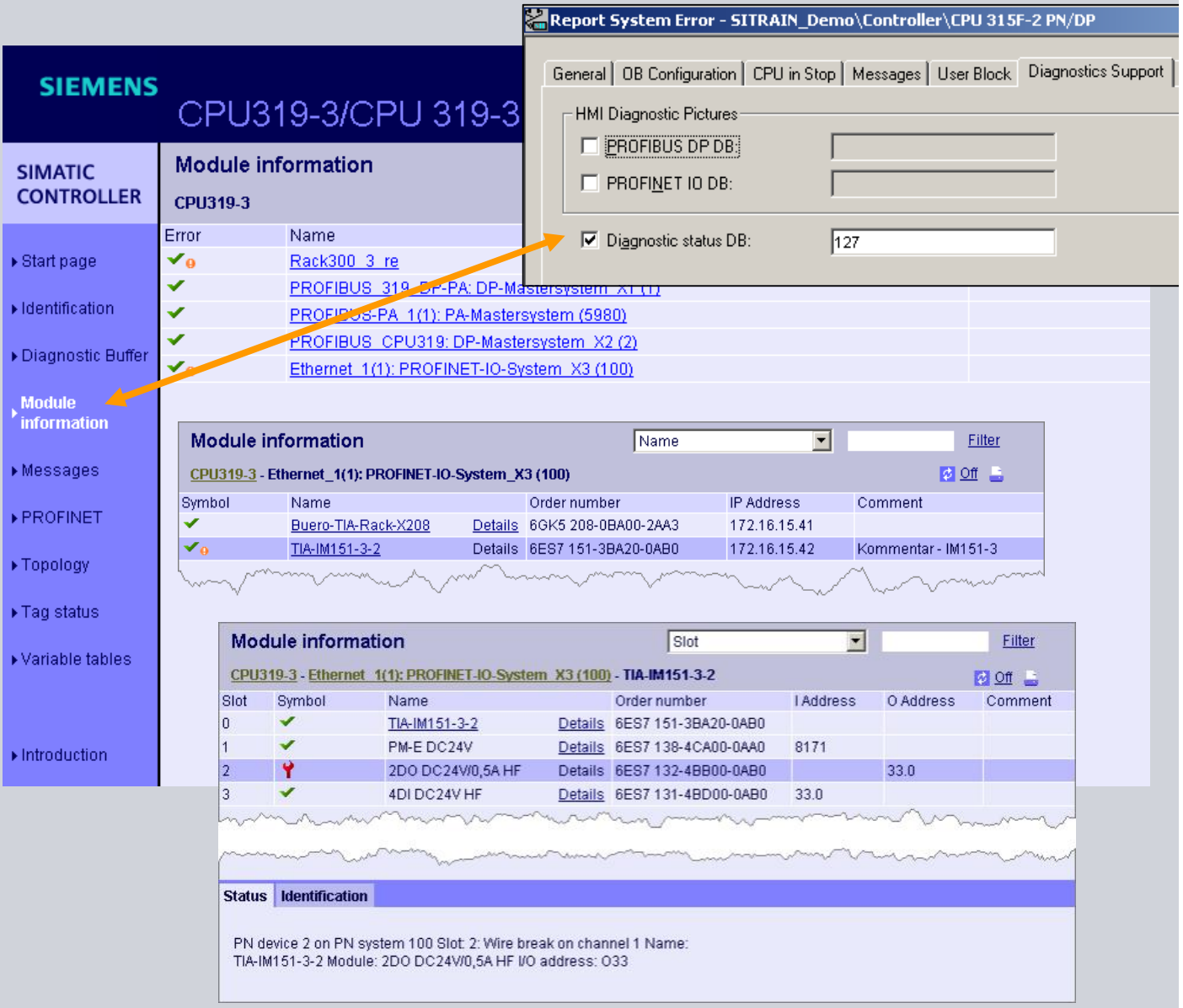
Exercise 2:
Web function



Creating DB127 in Report System Error is Mandatory for the Function "Module Information"

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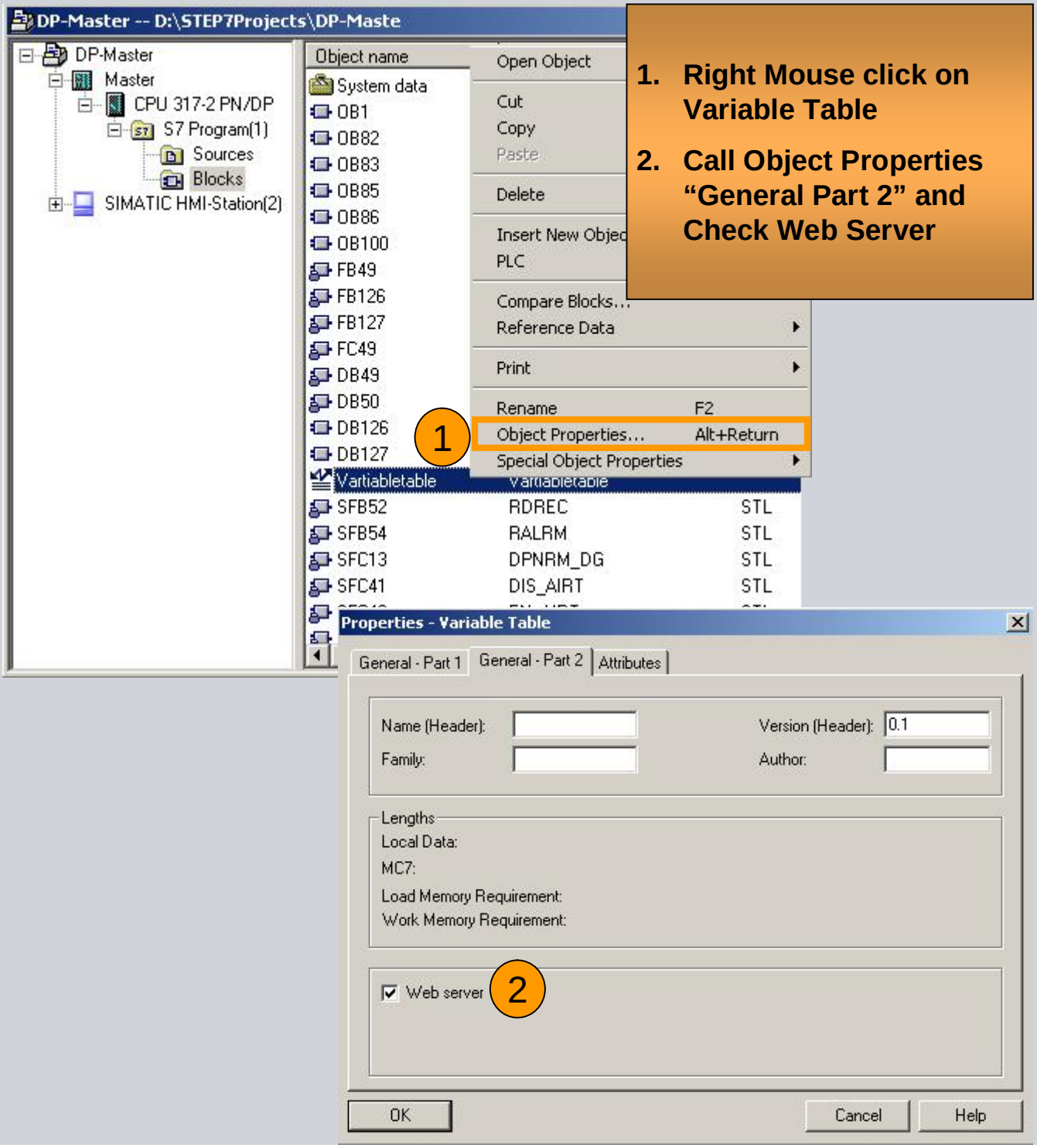
Exercise 2:
Web function



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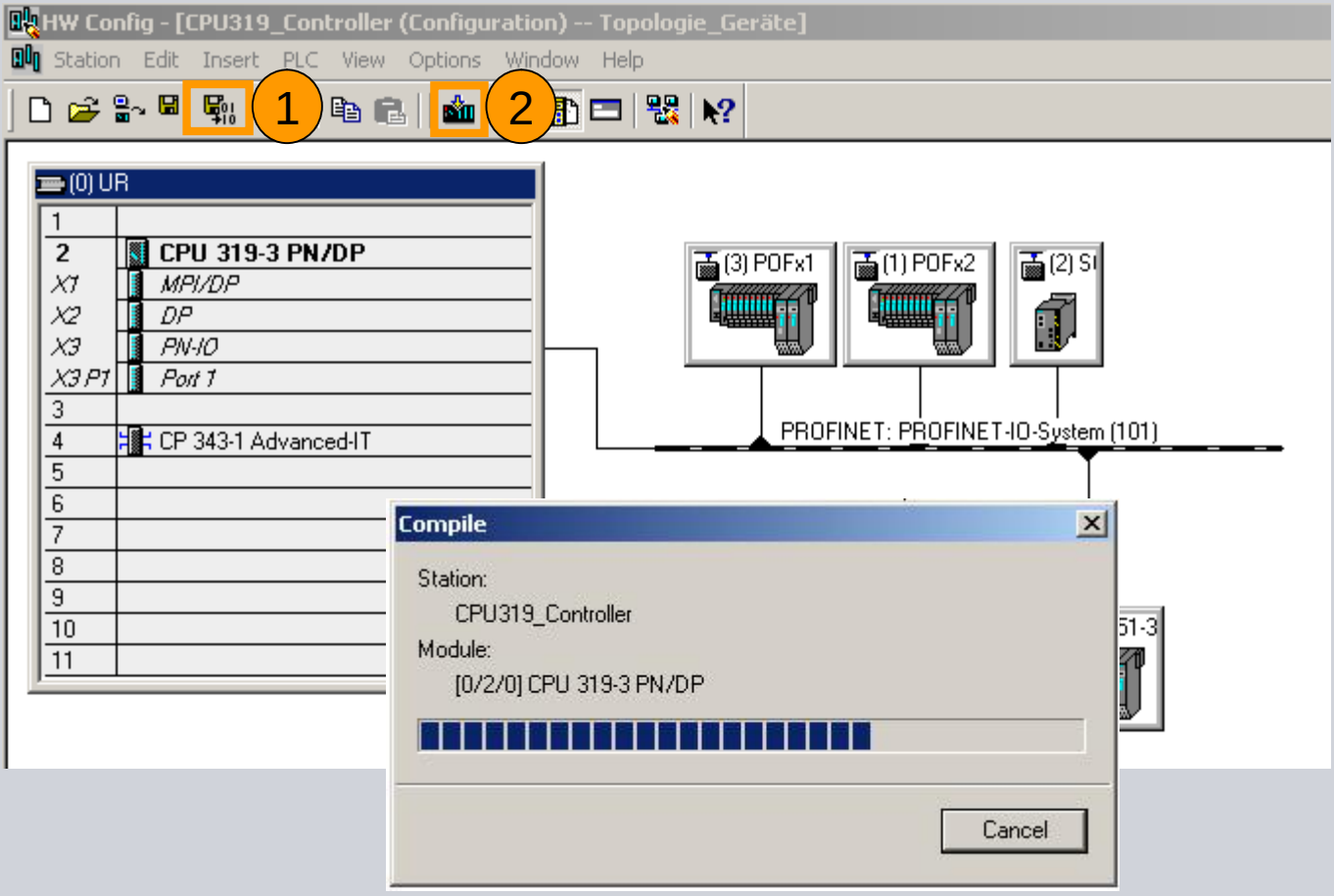
Exercise 2:
Web function



1. „Save&Compile“ of Hardware-Configuration is necessary.
2. Download of Hardware Config

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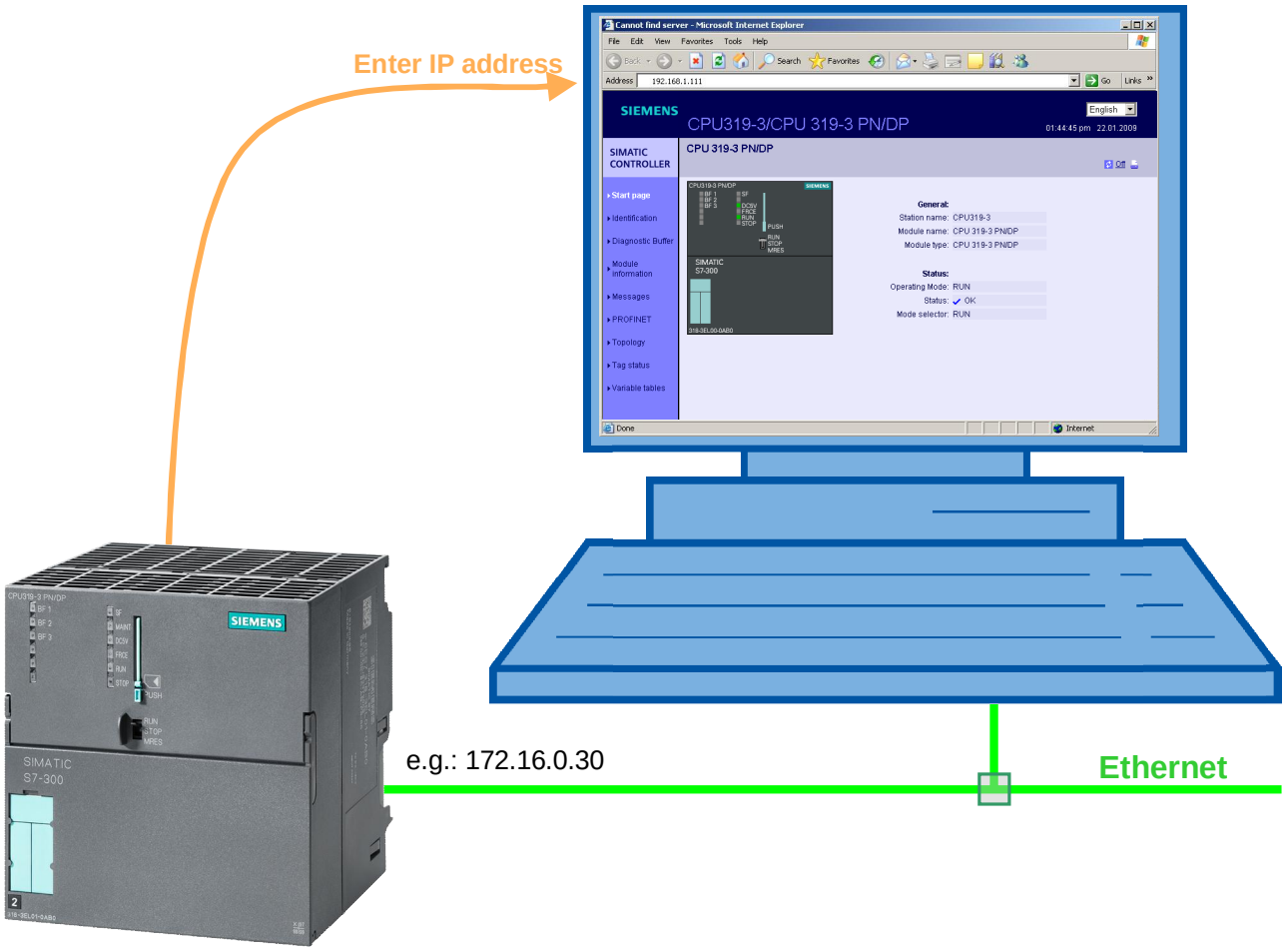
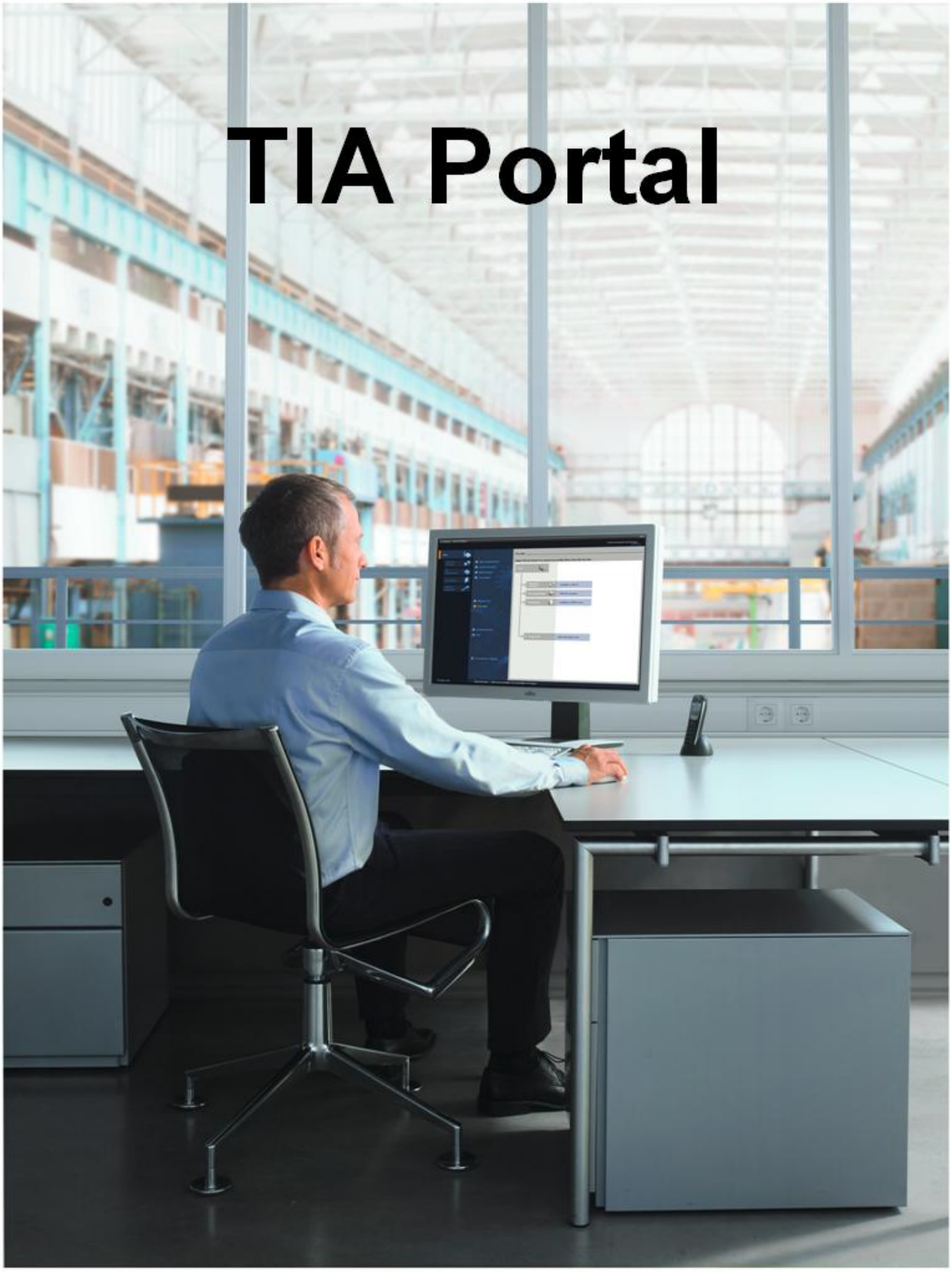
Exercise 2:
Web function



Start Web Browser and Test functionality

Industry Sector

TIA Portal



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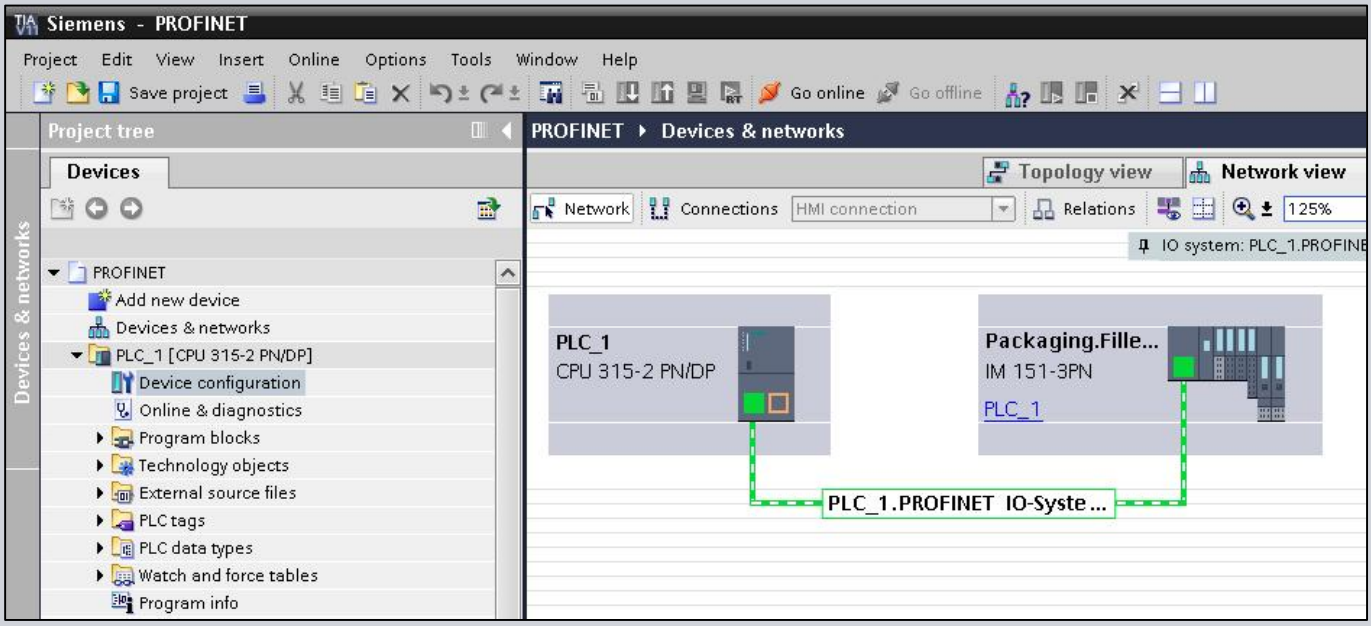
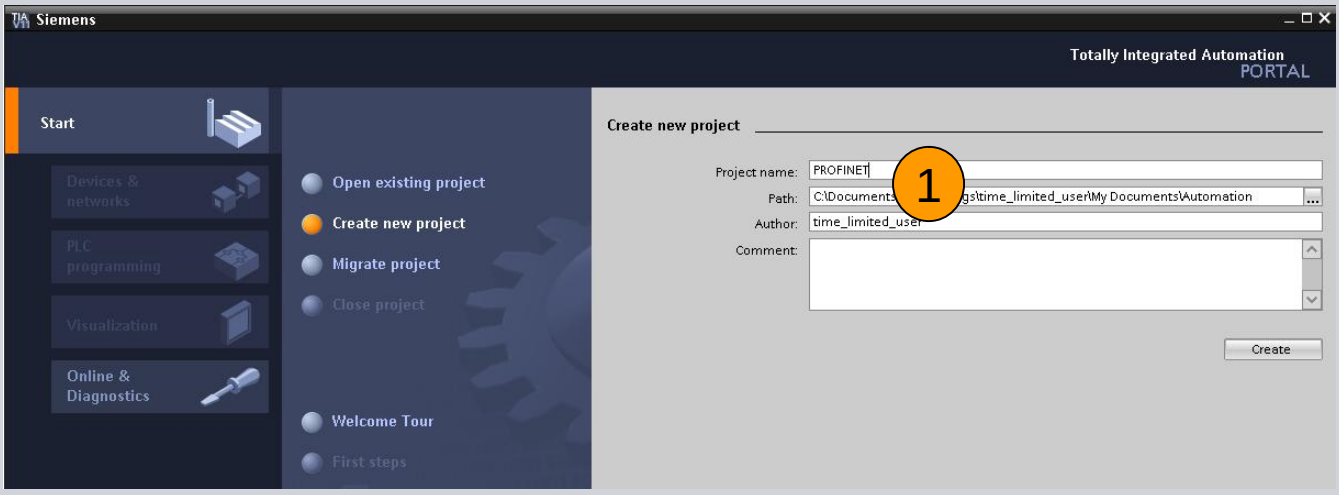
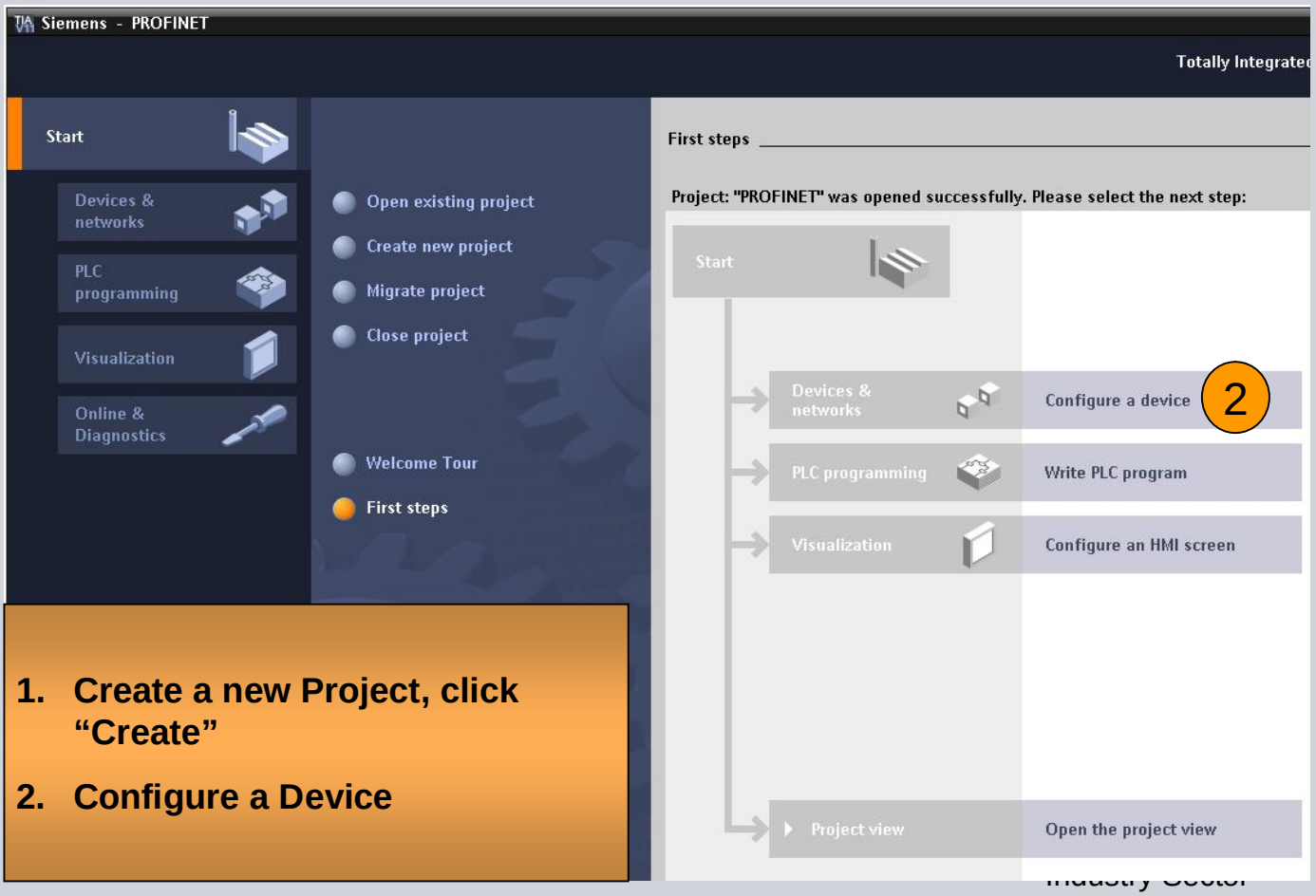
Exercise 2:
TIA Portal

1. Create Project in TIA Portal
2. Configure CPU and IO System
3. Insert IO-Devices from your Training Kit (ET200S, SCALANCE X)
4. Define and assign Device Names
5. Copy Error OBs
6. Download and test



Exercise 2:
TIA Portal

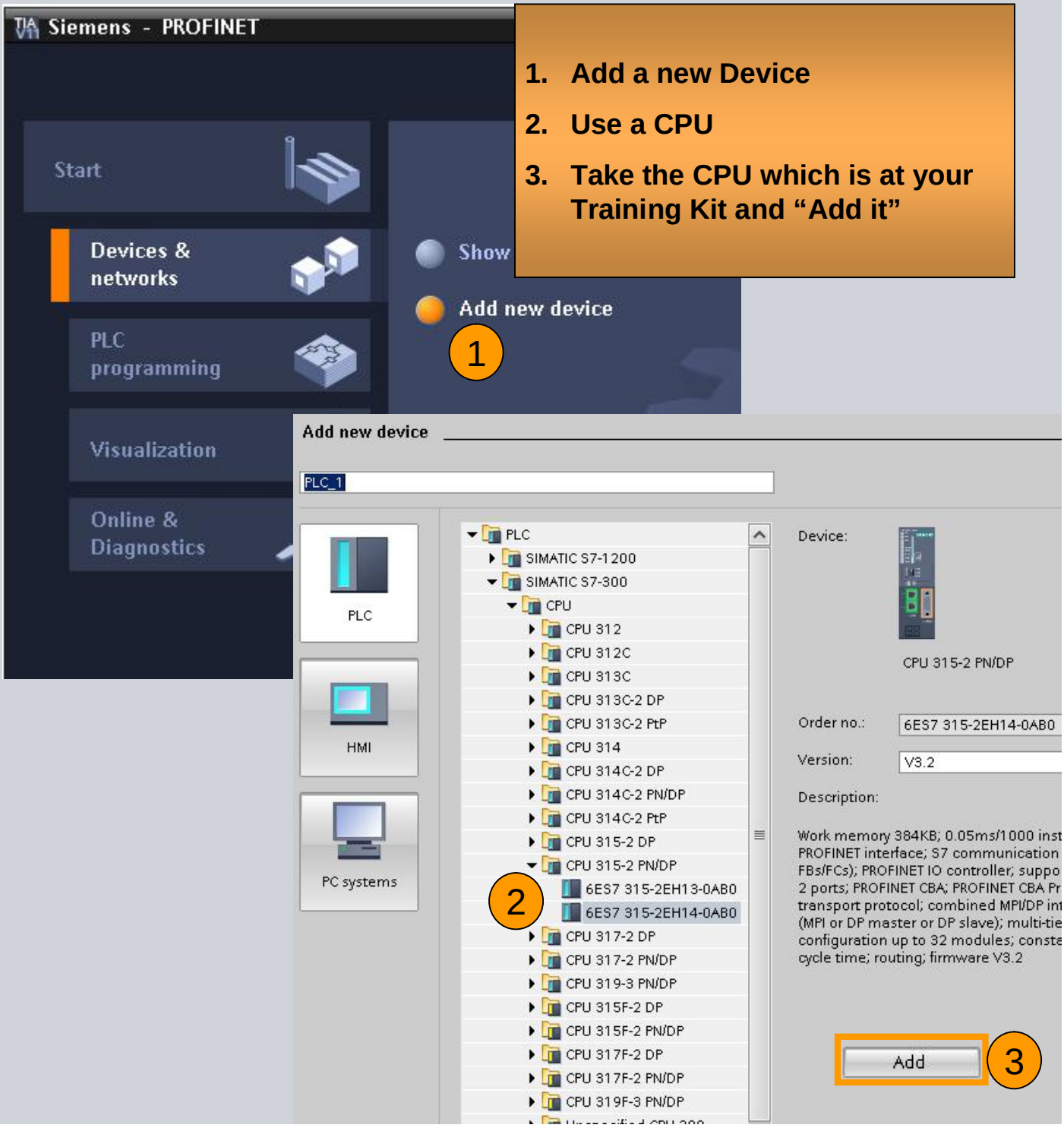




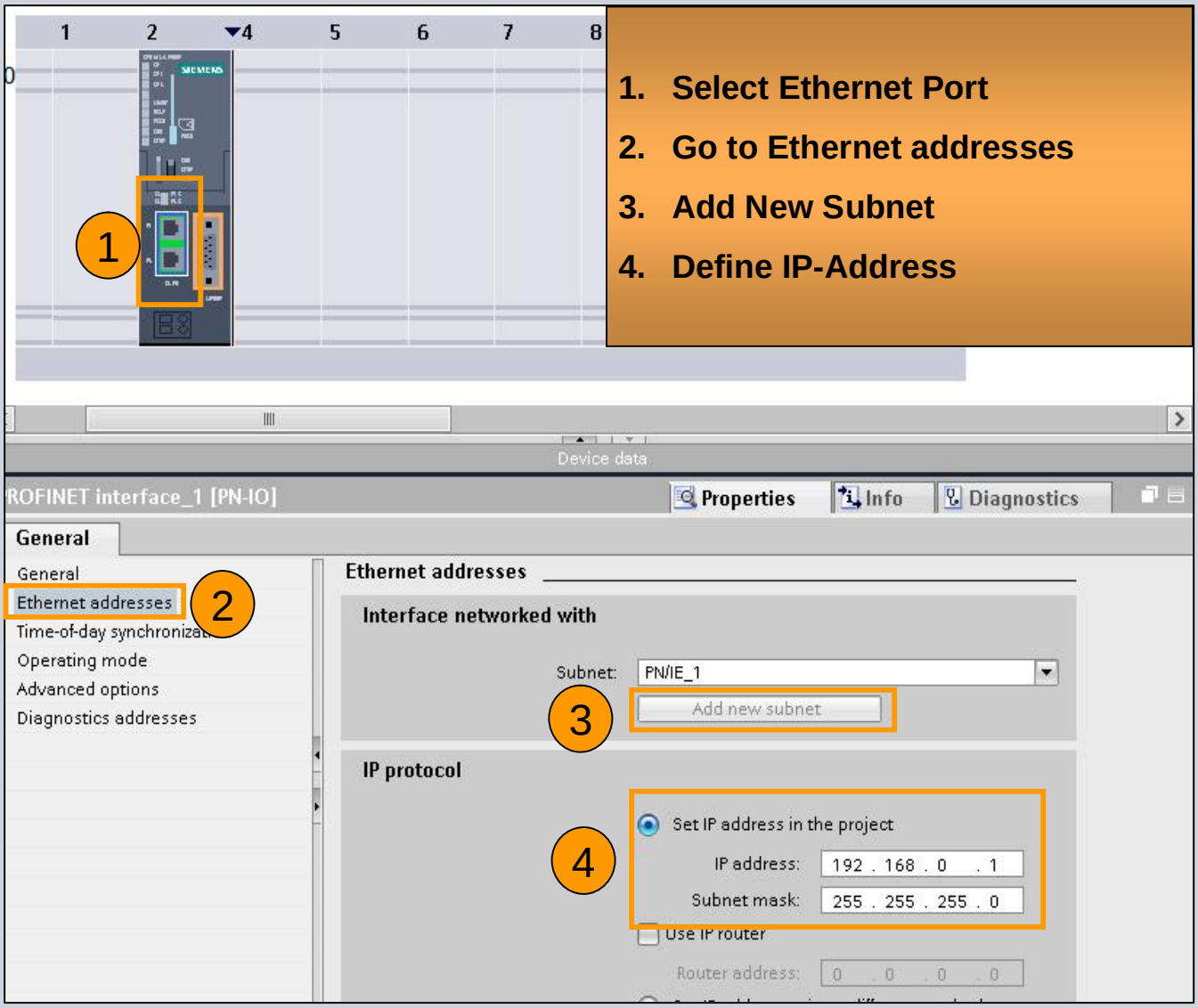
1. **Create a new Project, click "Create"**
2. **Configure a Device**

Exercise 2:
TIA Portal

SIEMENS

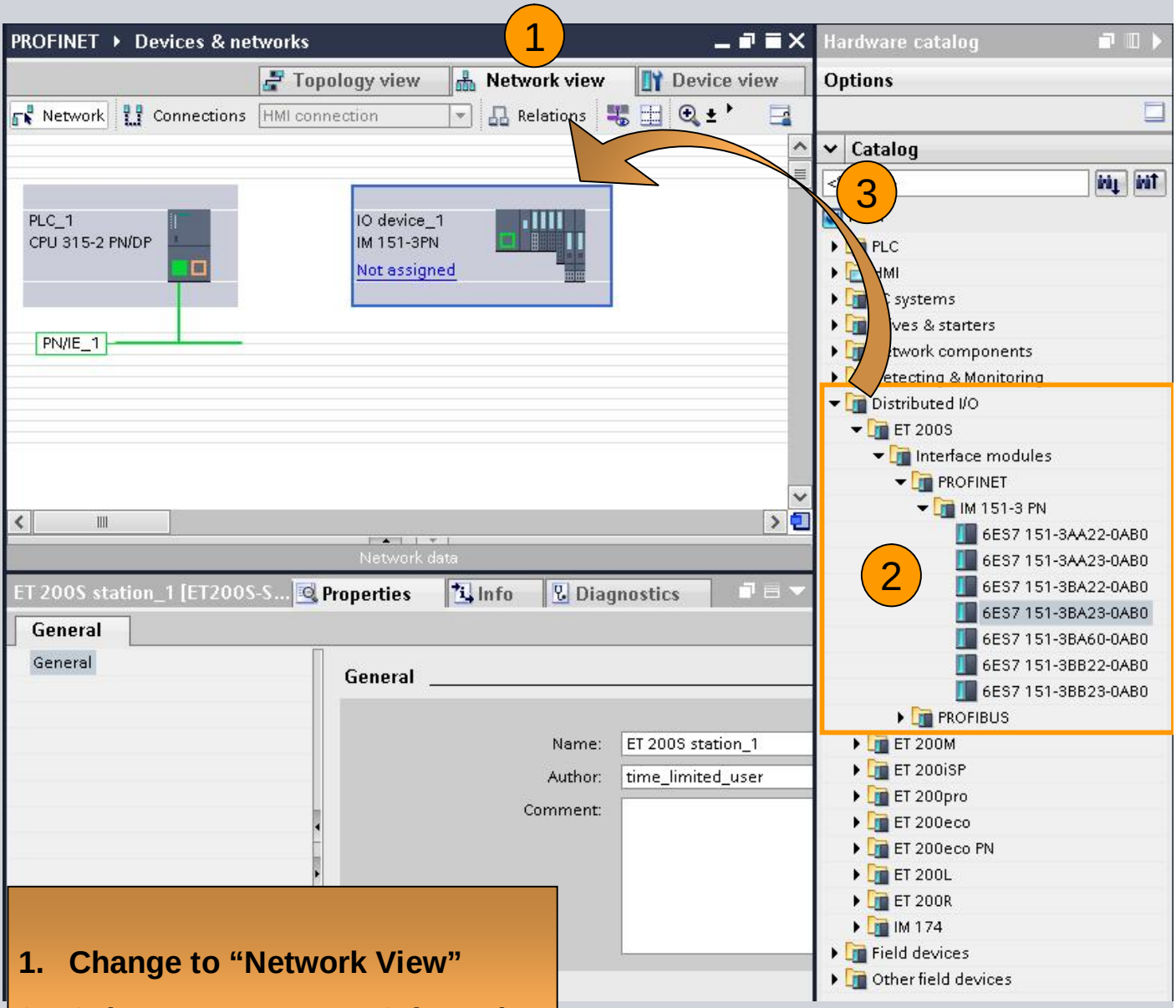


Exercise 2:
TIA Portal



Exercise 2:
TIA Portal

SIEMENS



1. **Change to “Network View”**
2. **Select your Remote IO from the Training Kit**
3. **Drag&Drop it into your working area**

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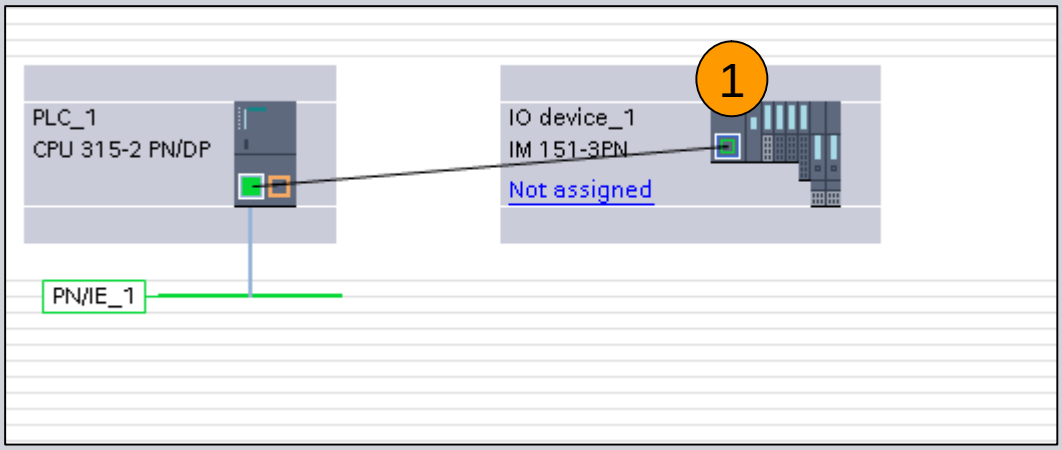
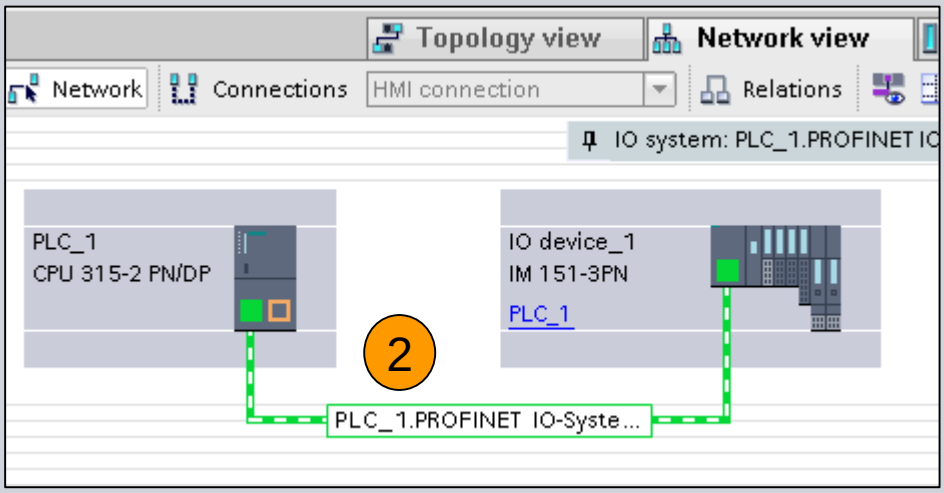
Exercise 2:
TIA Portal





1. **Drag Interface of the remote IO**
2. **Drop it to the Controllers Interface and release mouse**
3. **Repeat this step for all IO Devices**

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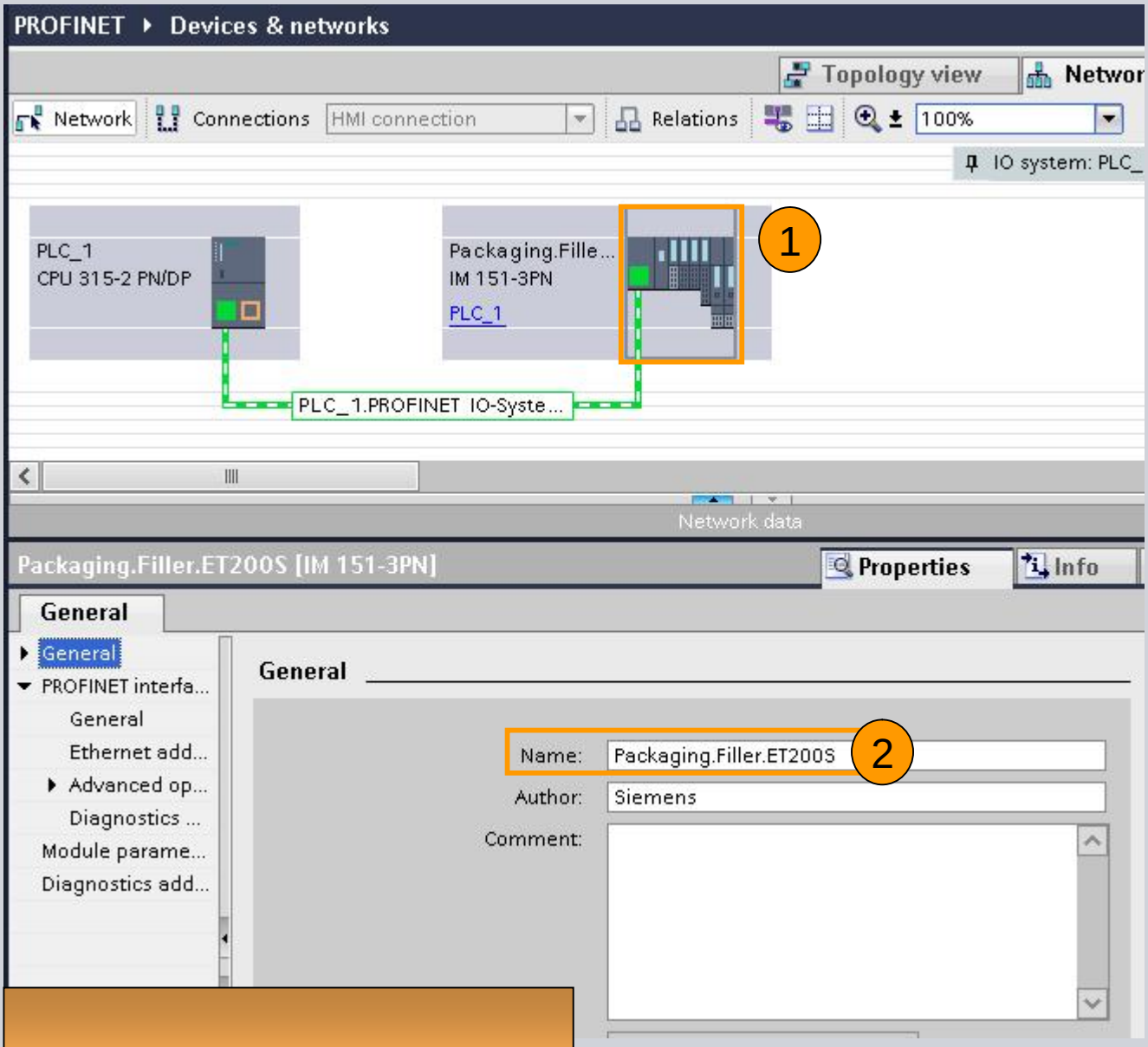
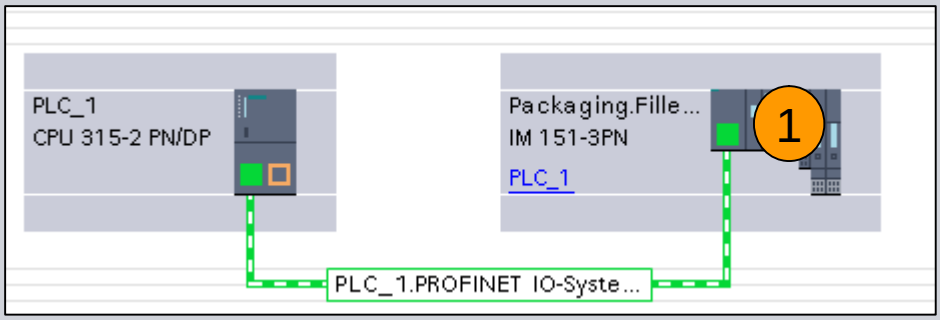
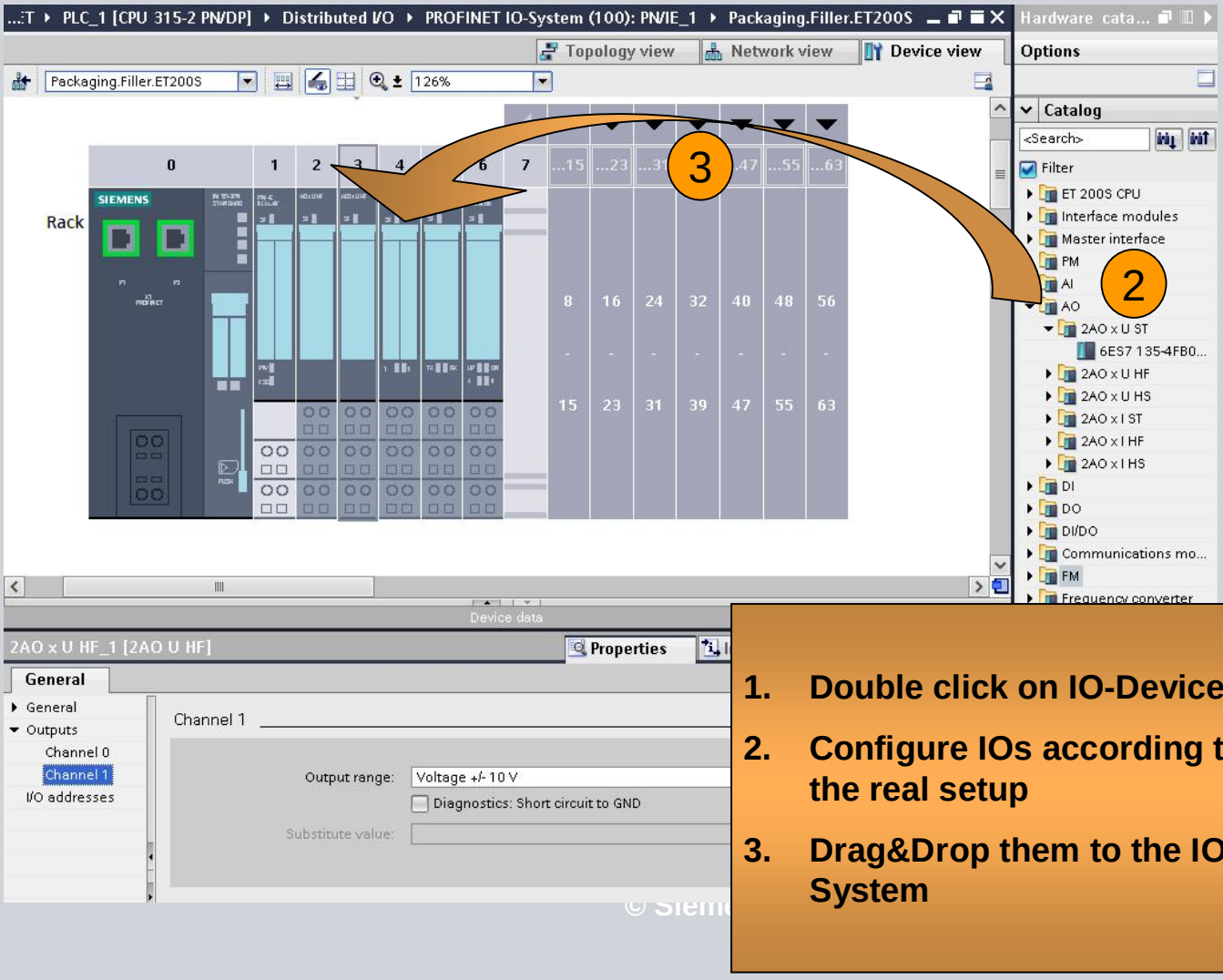
Exercise 2:
TIA Portal



1. **Select Device**
2. **Define Device Name**

Exercise 2:
TIA Portal

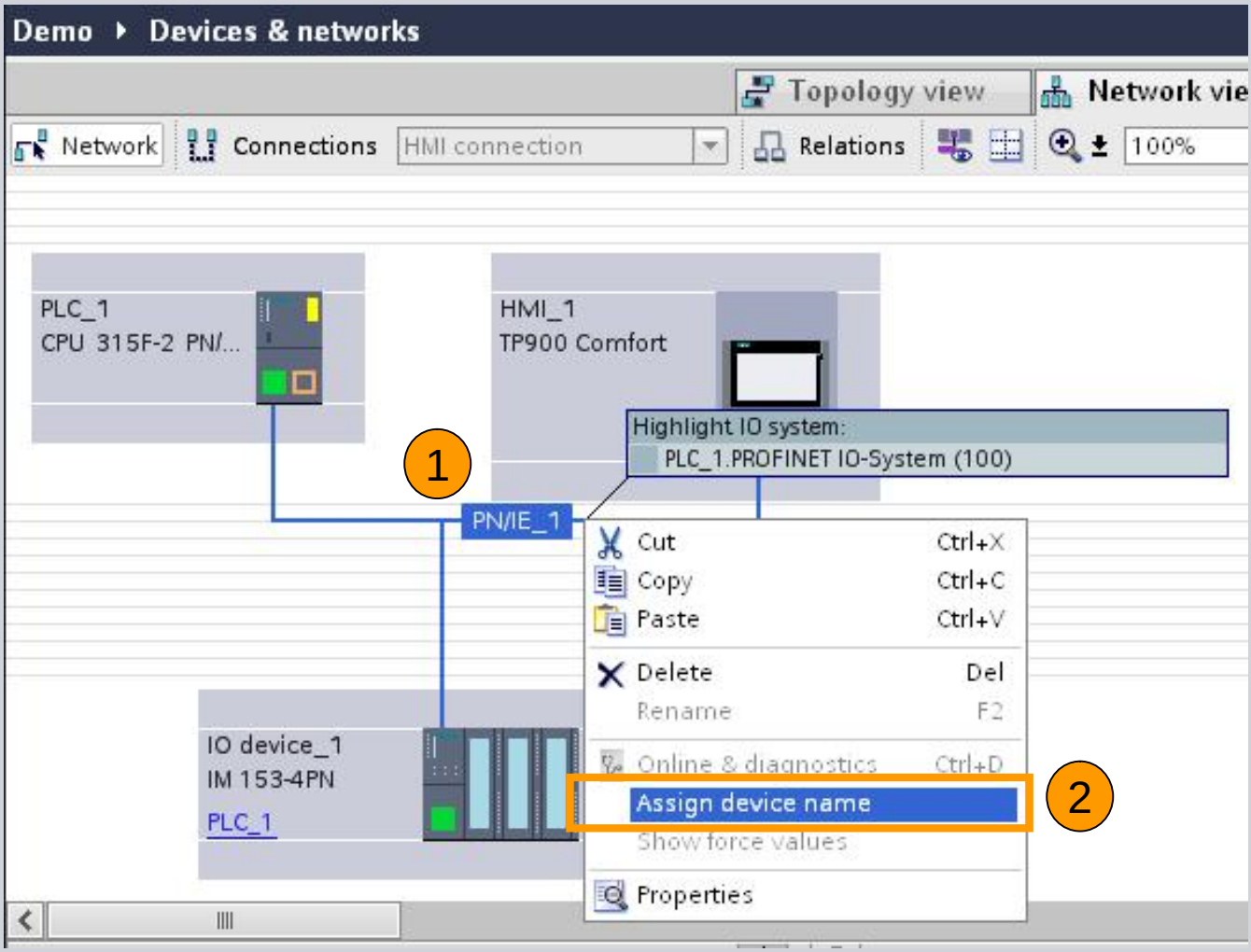




1. **Double click on IO-Device**
2. **Configure IOs according to the real setup**
3. **Drag&Drop them to the IO-System**

SIEMENS

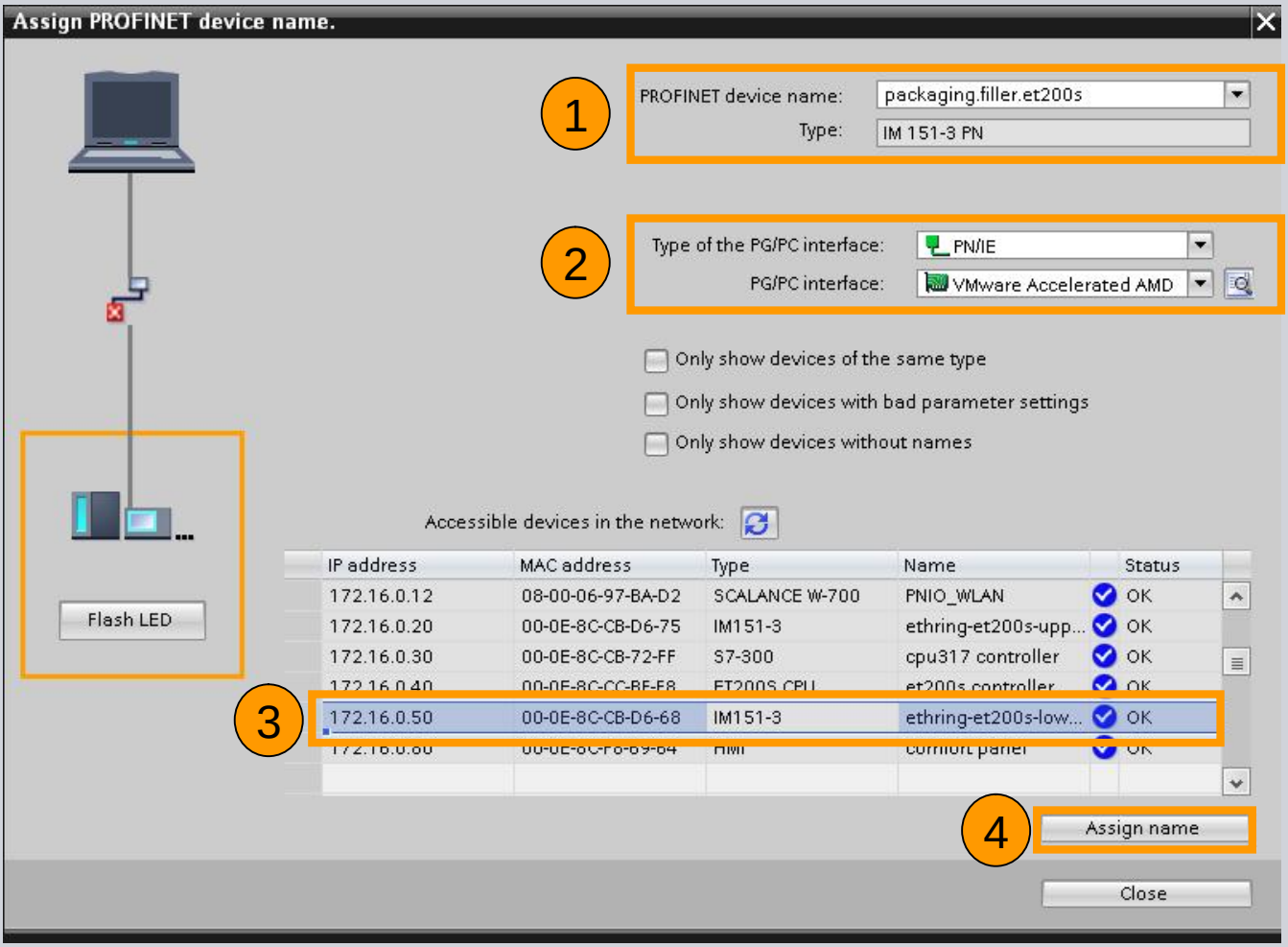
Exercise 2:
TIA Portal



1. **Right Mouse click on the PROFINET IO System**
2. **Call “Assign Device Name” dialog**

SIEMENS

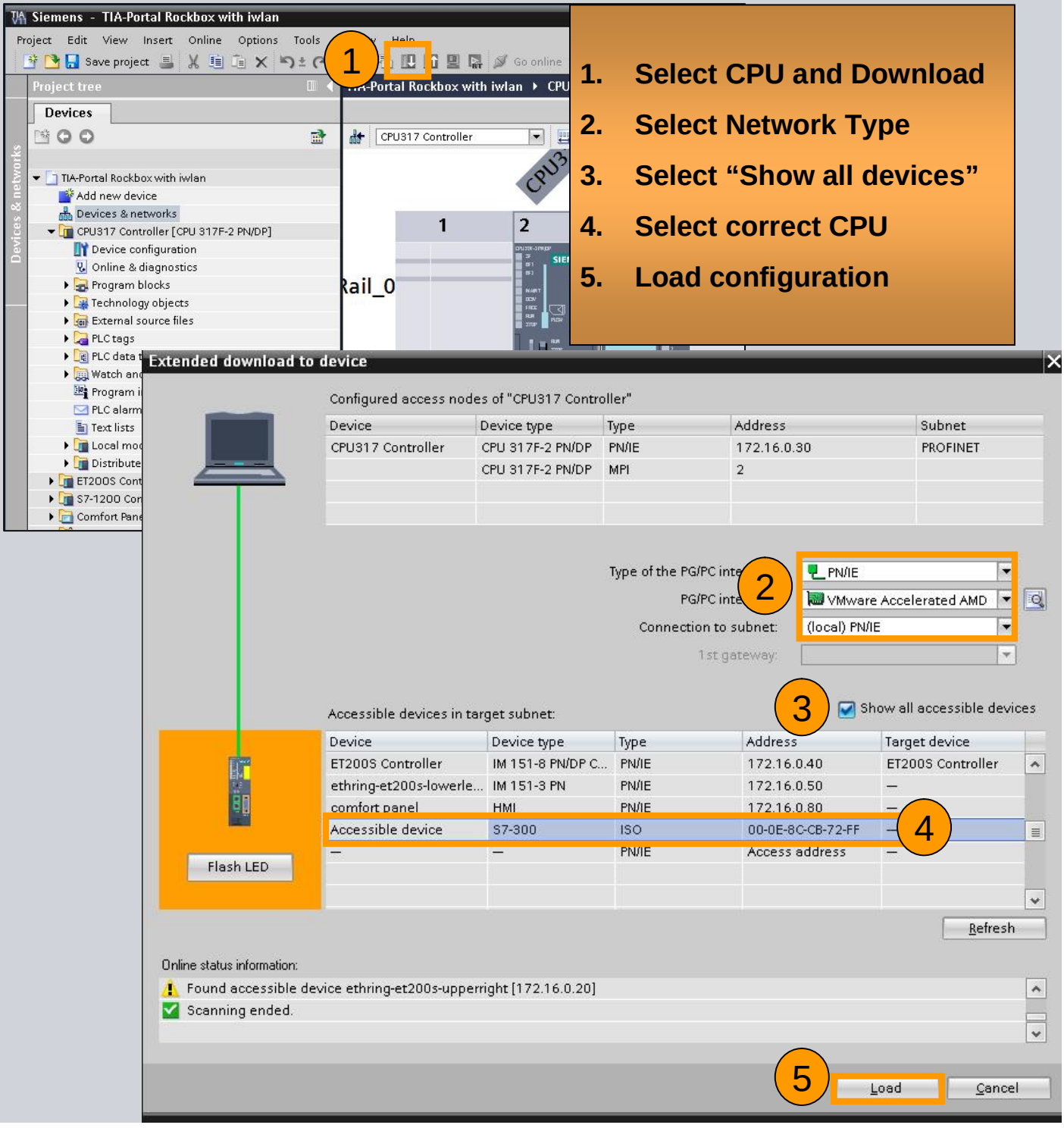
Exercise 2:
TIA Portal



1. **Select Device Name**
2. **Select Online Interface**
3. **Select Device you want to address**
4. **“Assign Name”**

Exercise 2:
TIA Portal

SIEMENS



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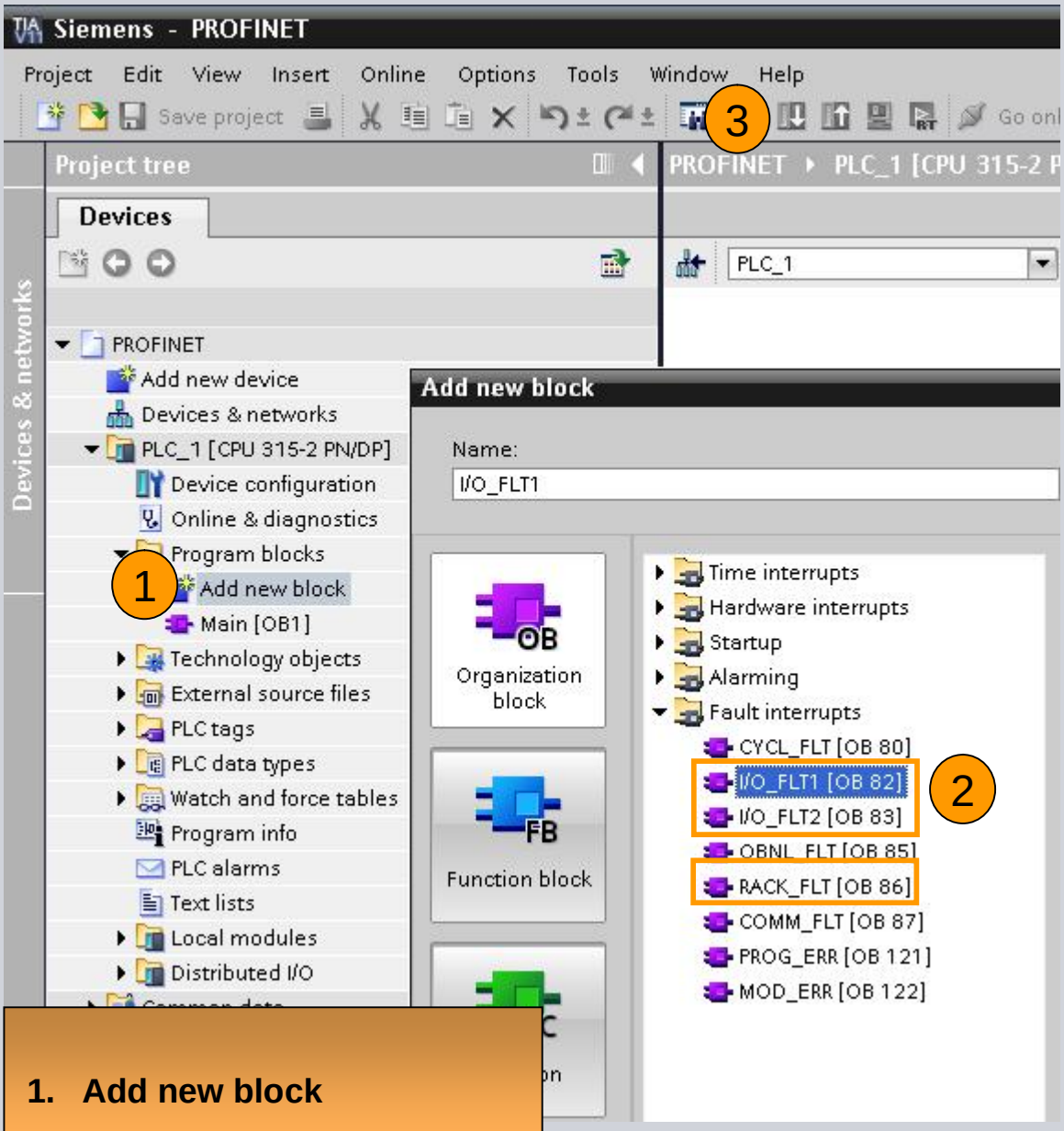
Exercise 2:
TIA Portal



1. **Add new block**
2. **Add OB82, OB83, OB86**
3. **Download Blocks**

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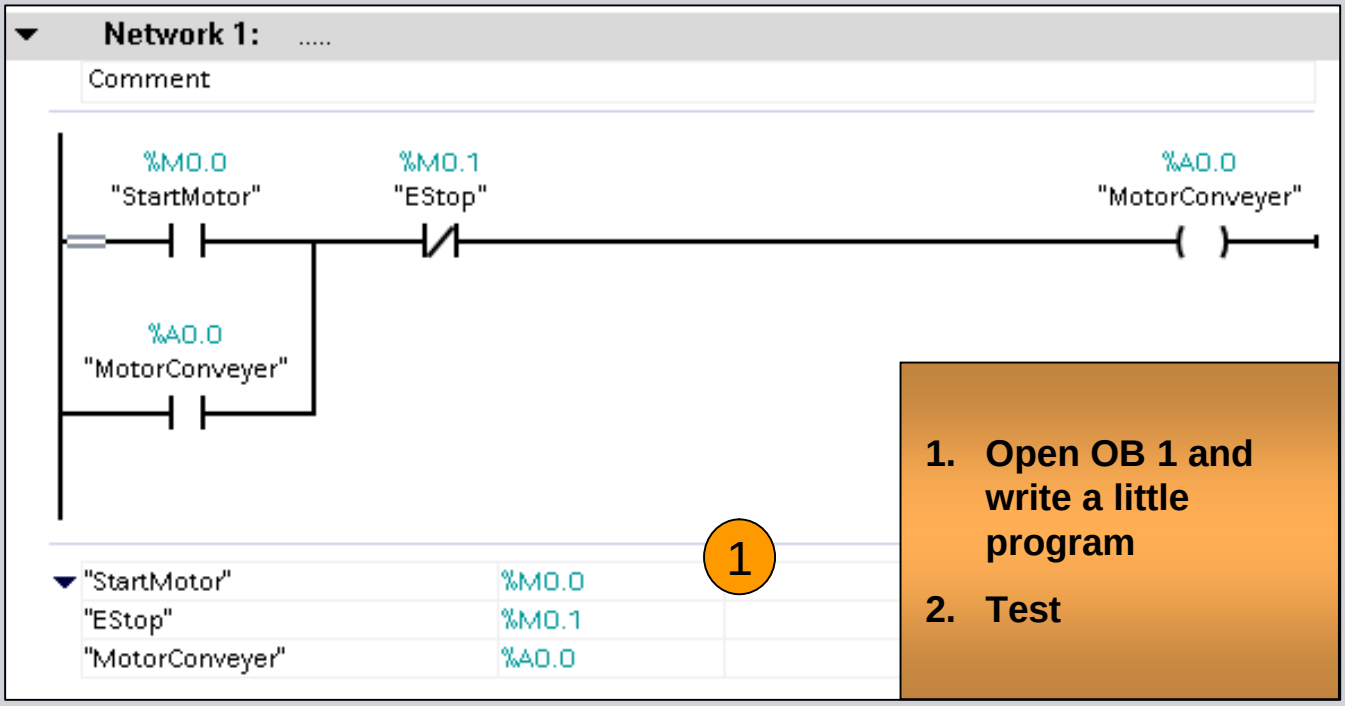
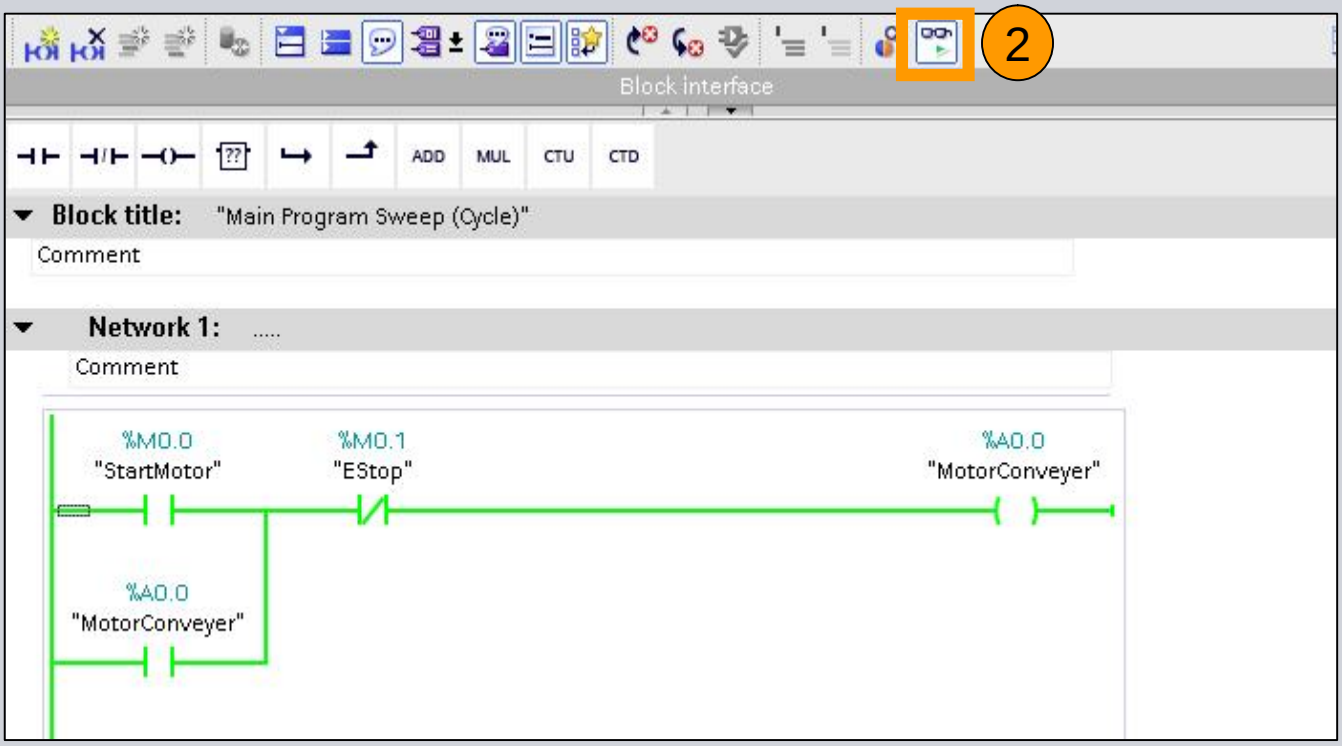
Exercise 2:
TIA Portal





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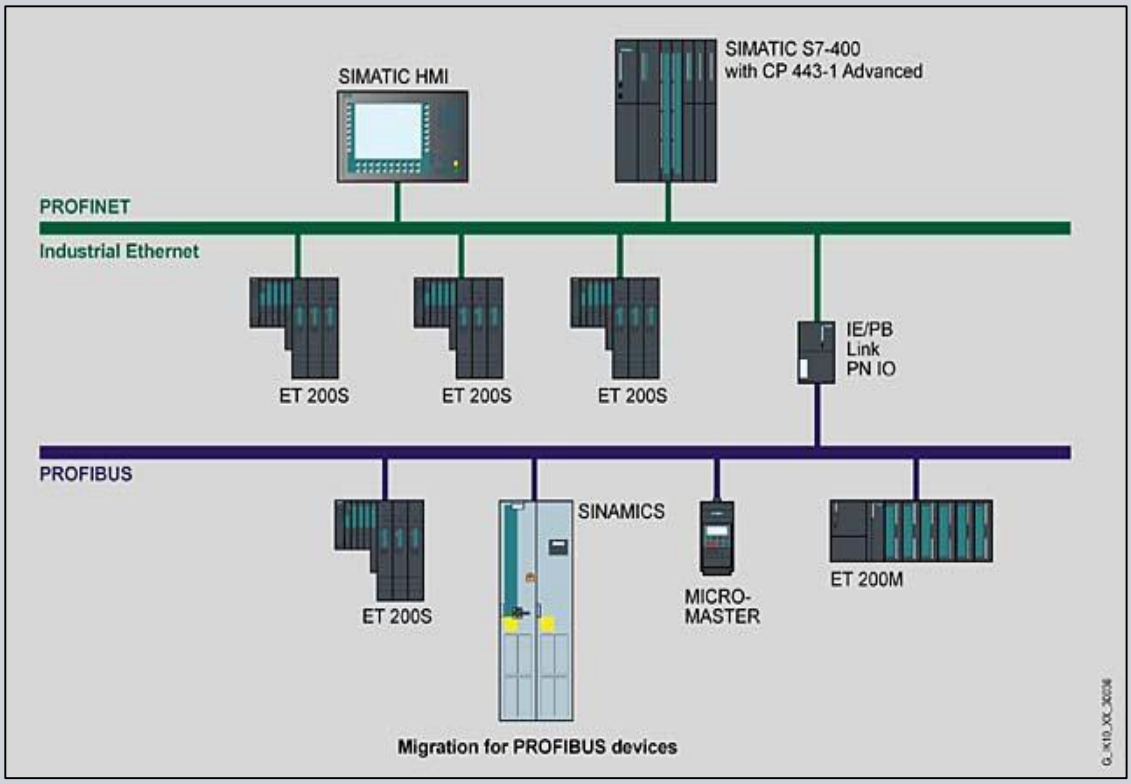
Exercise 3:
Fieldbus Integration

1. Integrate IE/PB-Link in your project
2. Configure PROFIBUS Network
3. Download and test



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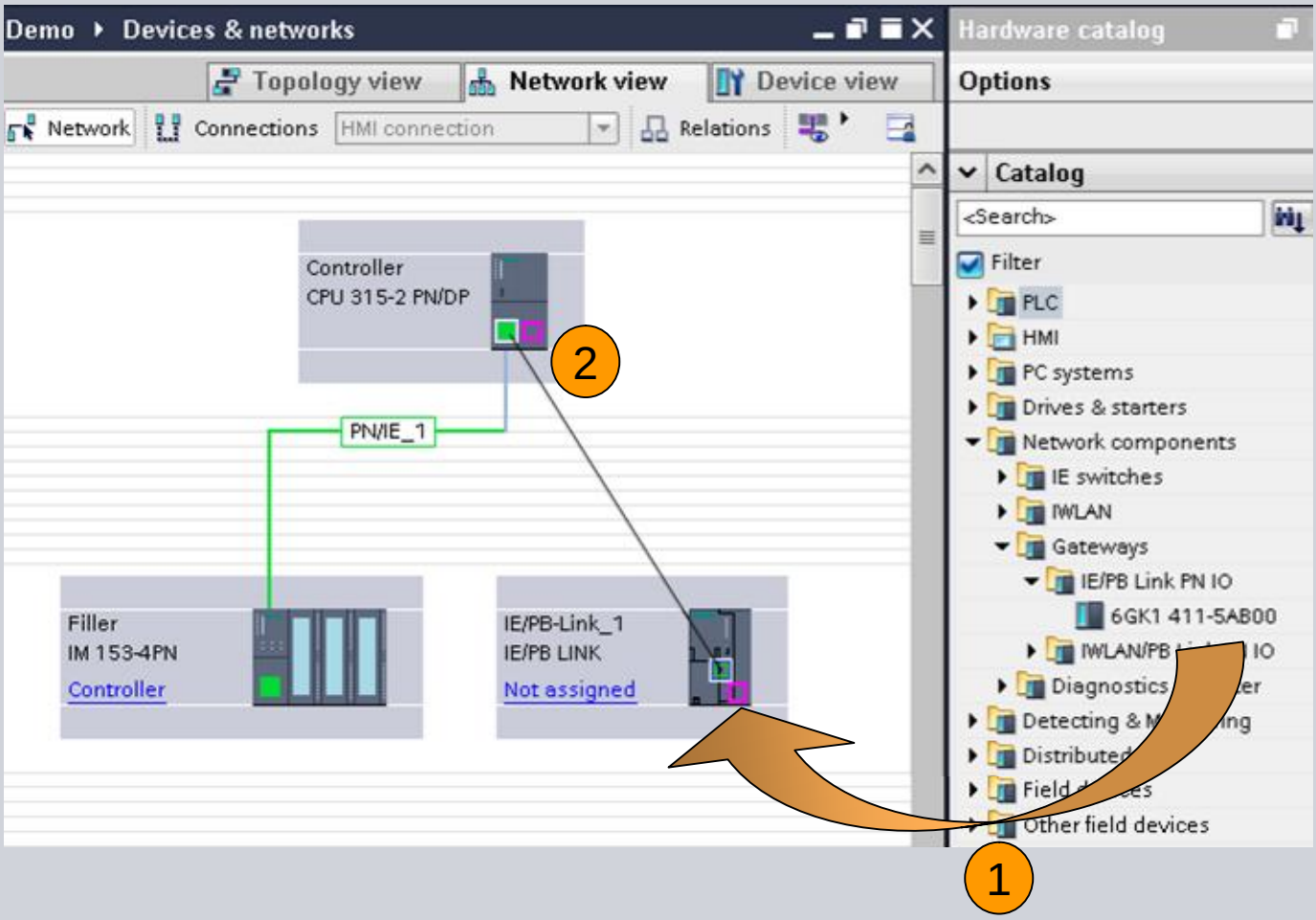
Exercise 3:
Fieldbus Integration



1. **Select the Gateway you want to use**
2. **Drag and Drop it to your Network View**
3. **Connect the Ethernet Port to the IO-Controller**

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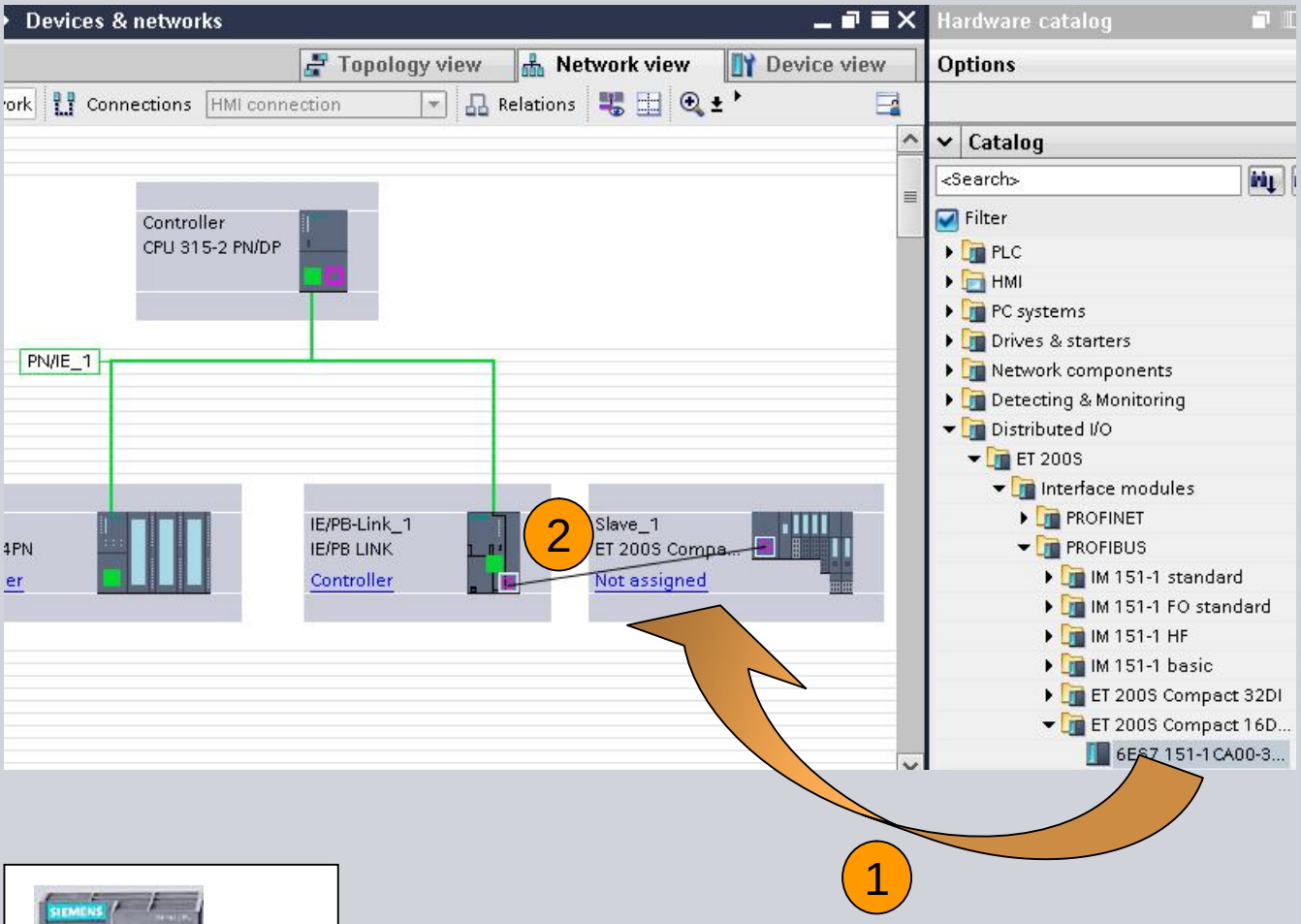
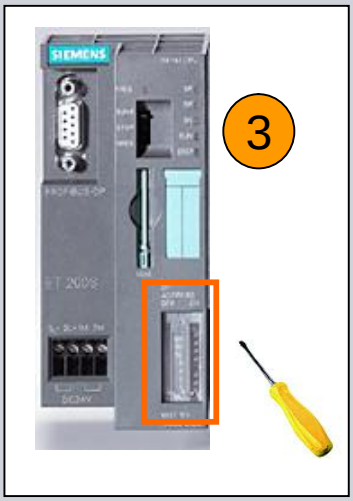
Exercise 3:
Fieldbus Integration





1. **Select the DP-Slave, Drag and Drop it to your Network View**
2. **Connect the PROFIBUS Port to the Proxy**
3. **Set PROFIBUS-Address**

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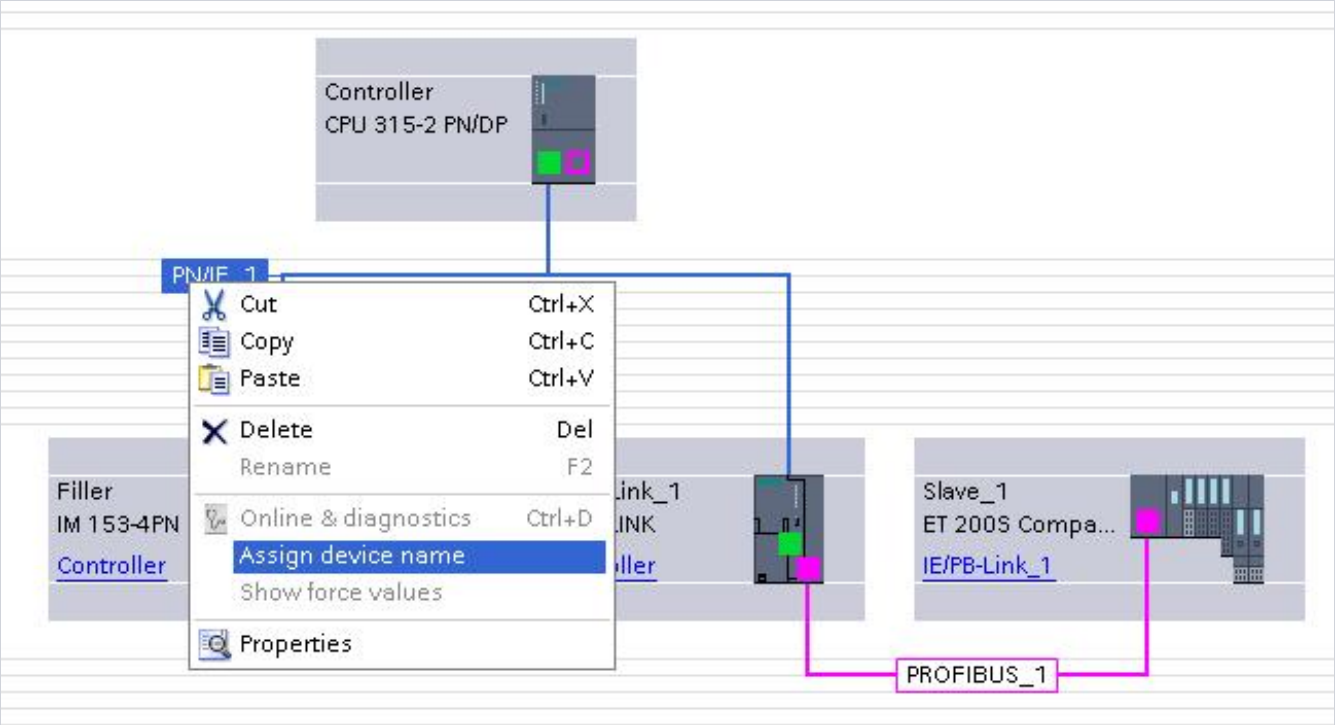
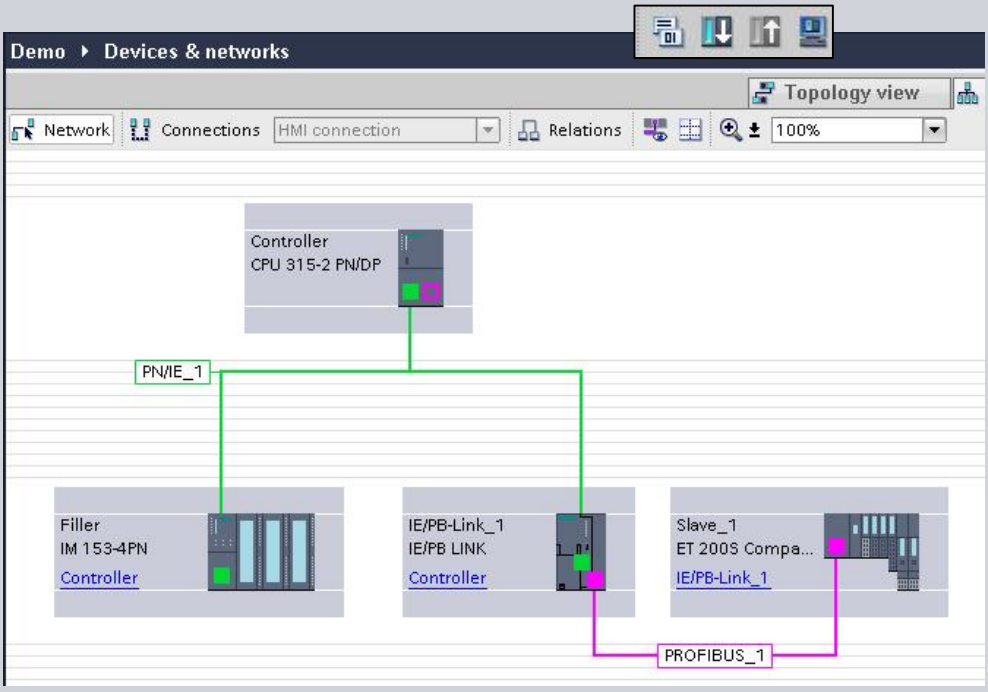
Exercise 3:
Fieldbus Integration





1. **Assign device name to the Proxy**
2. **Download and test**

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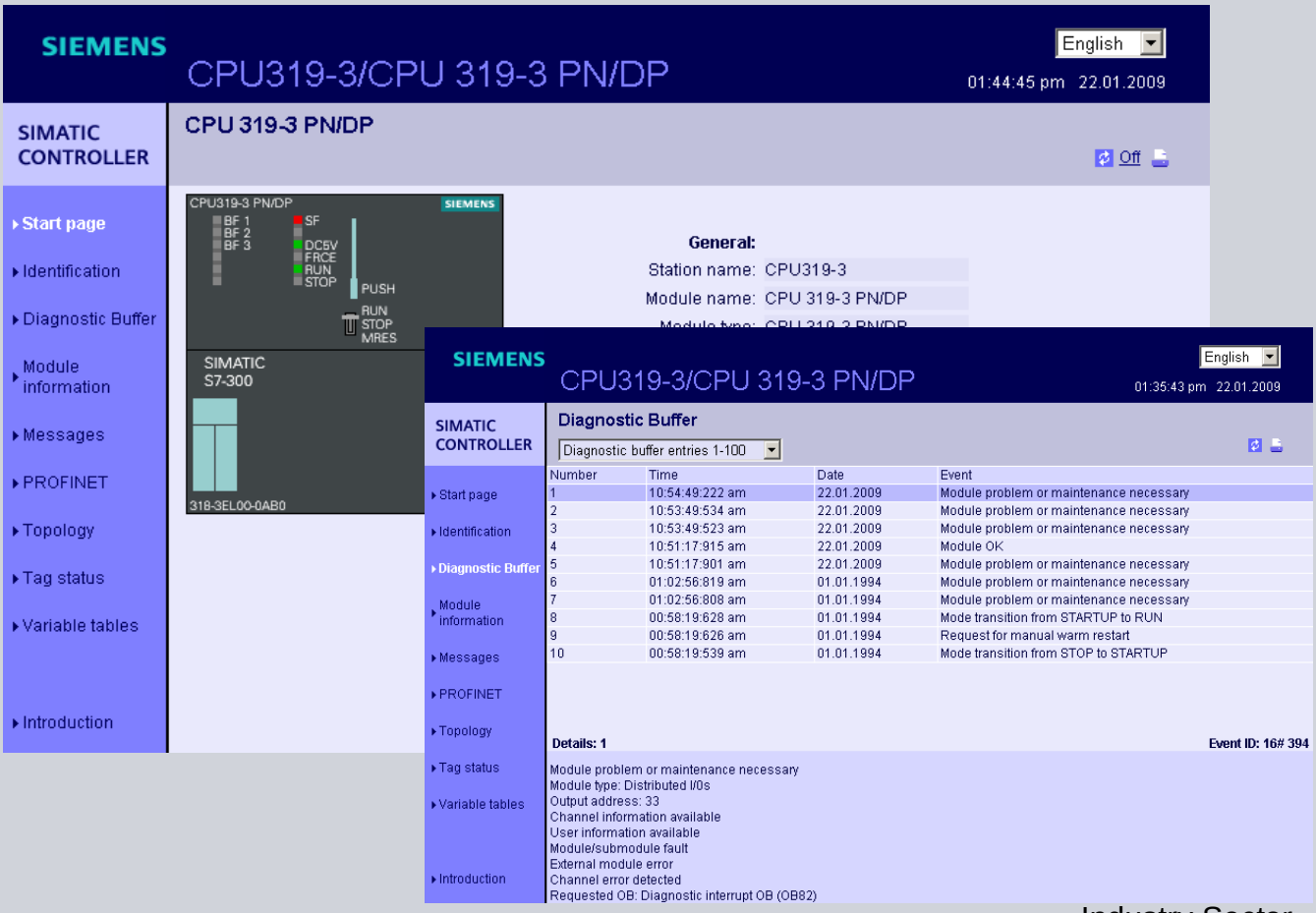
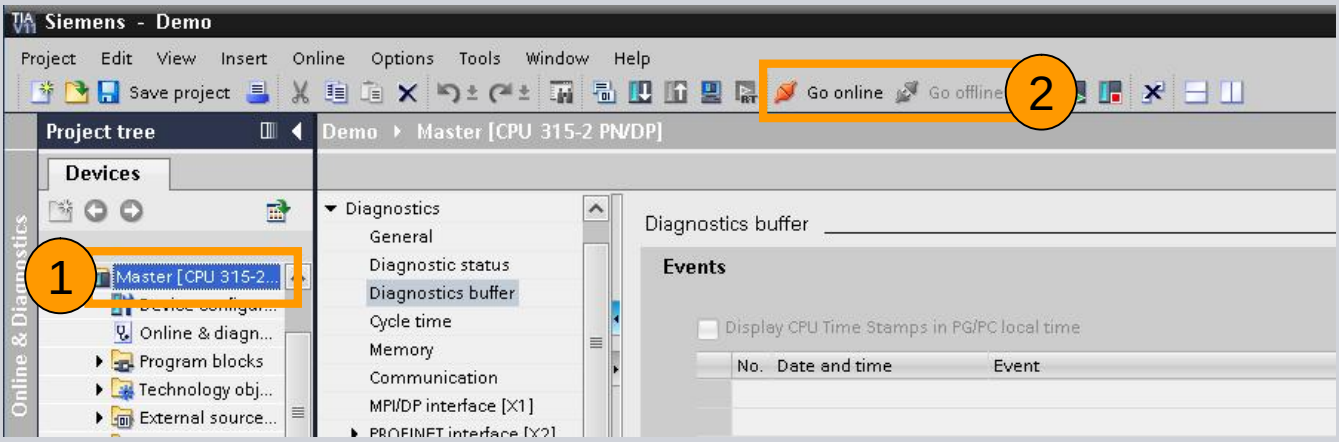
Exercise 4:
Diagnostic

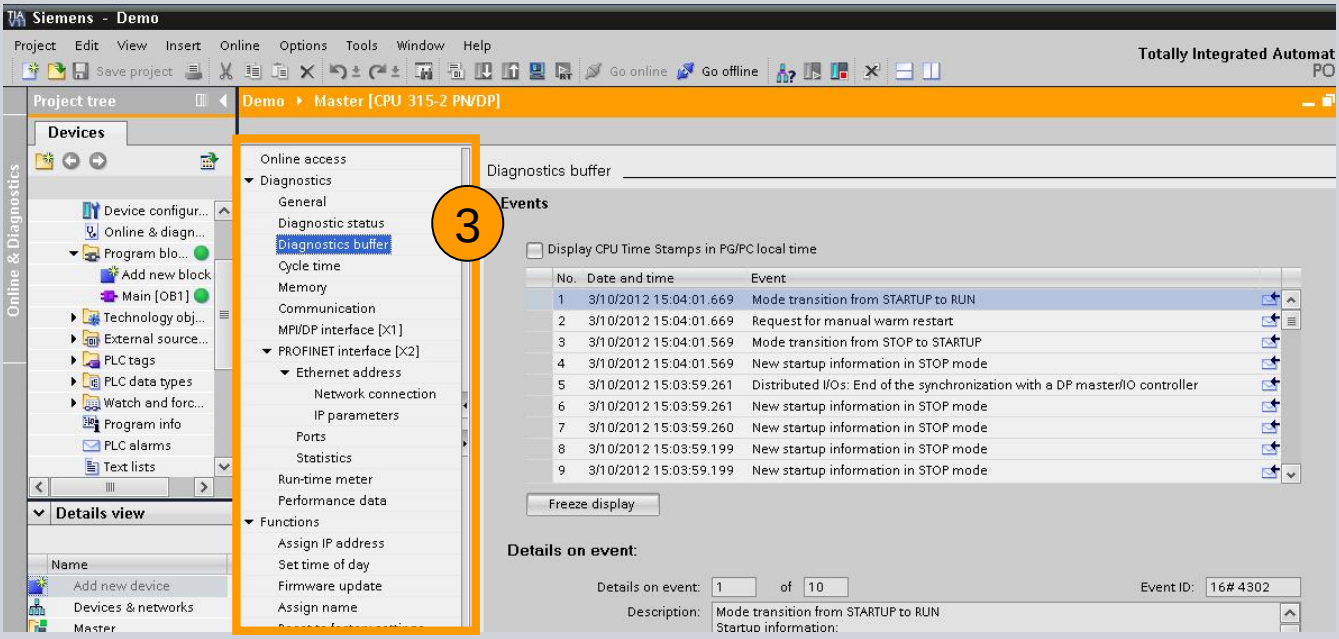
1. Go Online, read CPU Diagnostic
2. Switch on Online mode in Network and Device view
3. Create Report System Error
4. Activate Web interface
5. Define a Watch table for the Web interface
6. Download and test



Exercise 4:
Diagnostic



1. **Select the PLC you wish to go Online**
2. **Select “Go online” Button**
3. **Read Online Information's and Functions**



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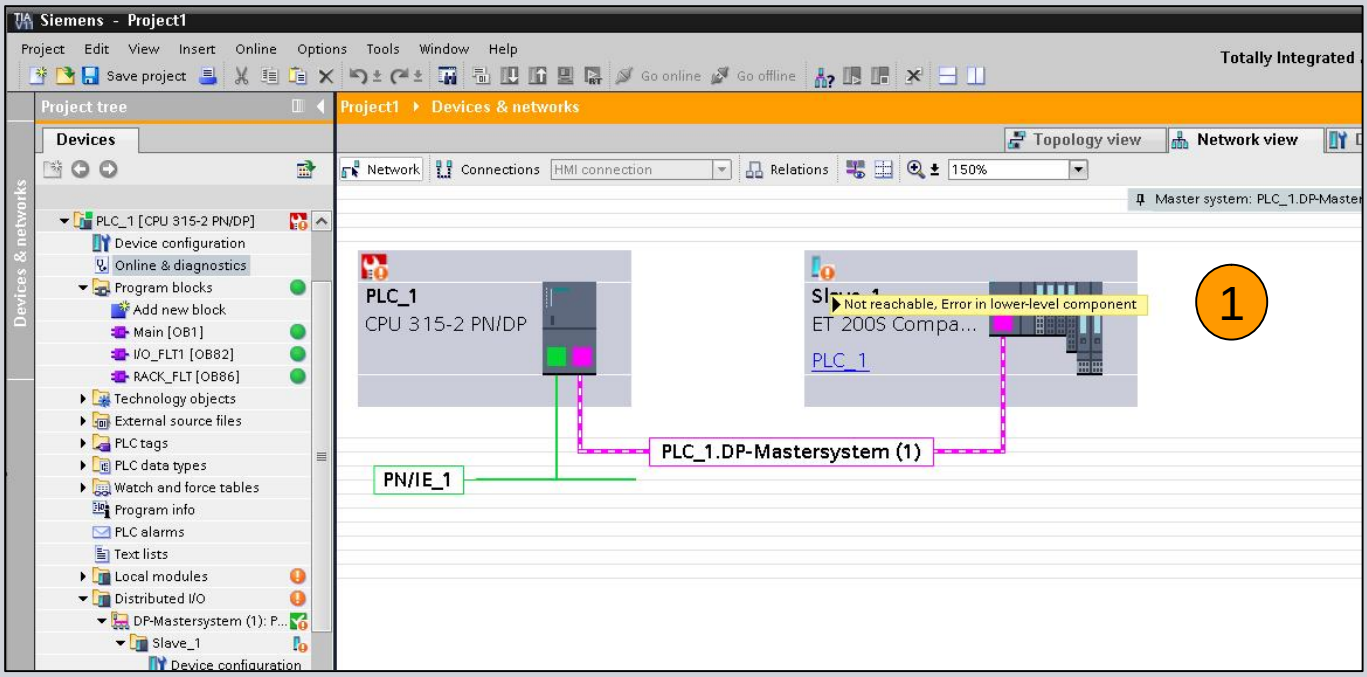
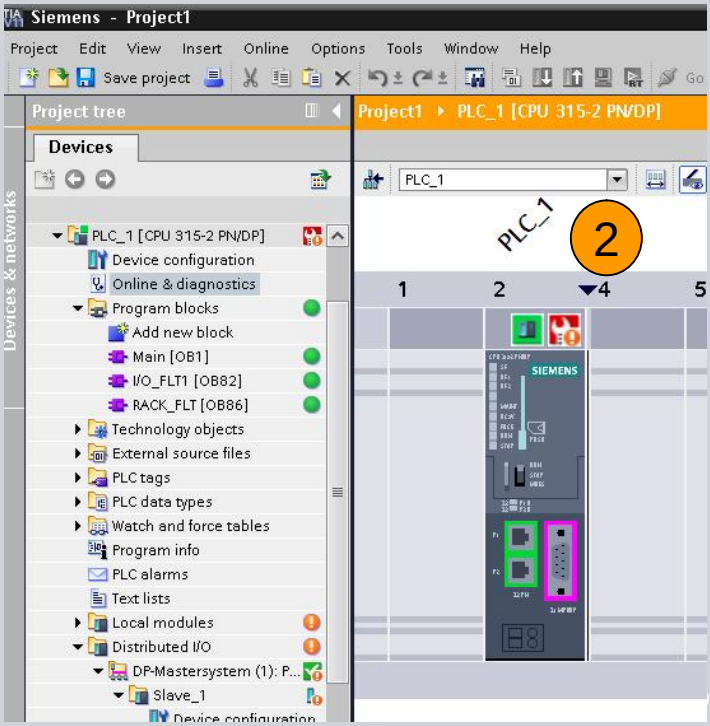
Exercise 4:
Diagnostic





1&2 Change to Device View and Network view and read the diagnostic Information.

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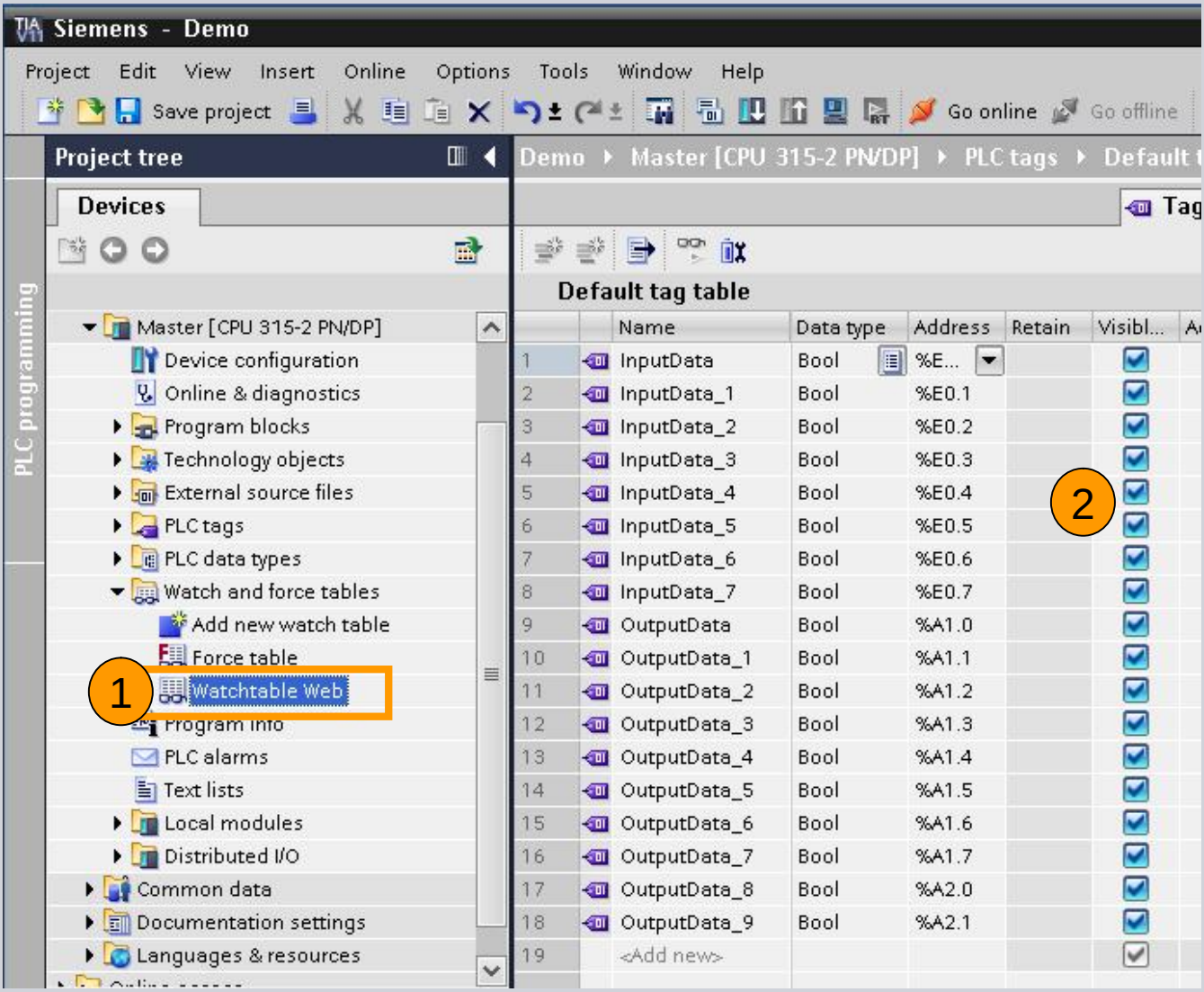
Exercise 4:
Diagnostic



1. **Select “Watch & Force Table” and add a Watch table for the Web interface.**
2. **Define variables**

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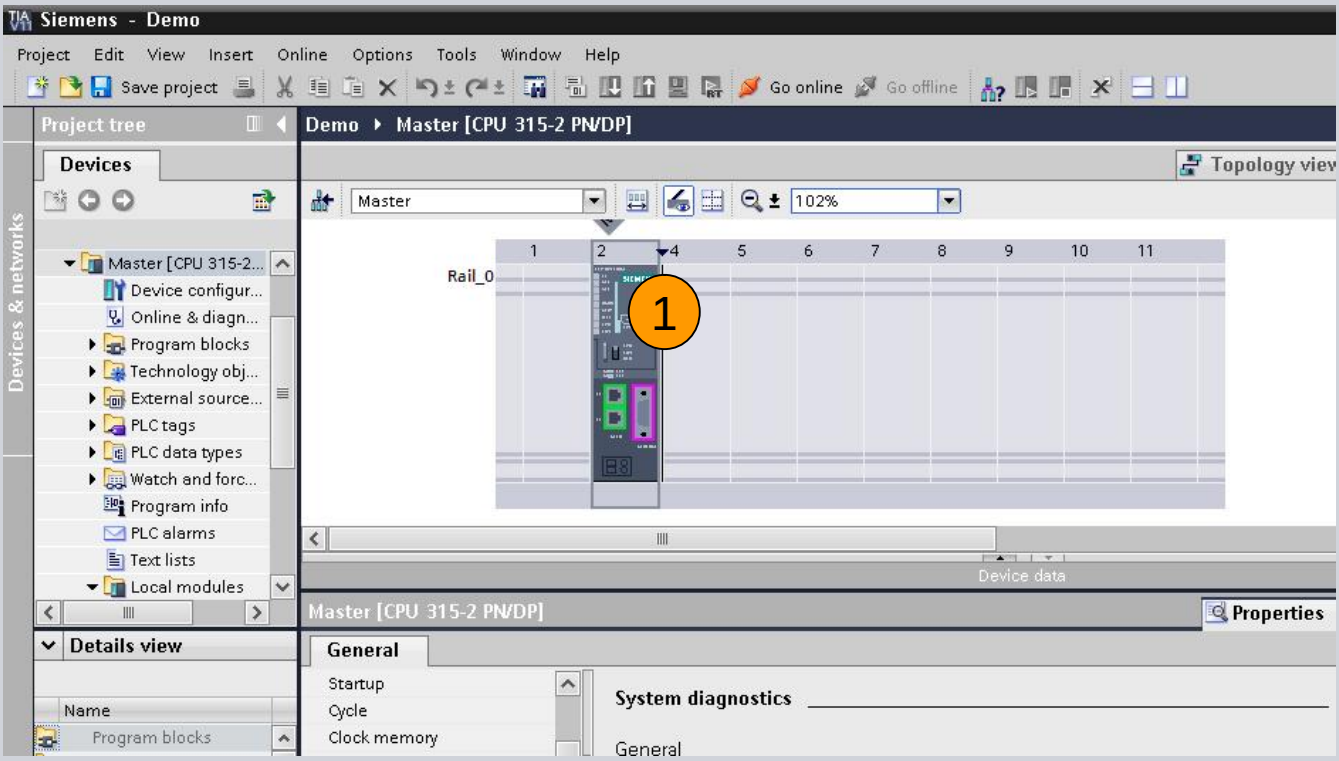
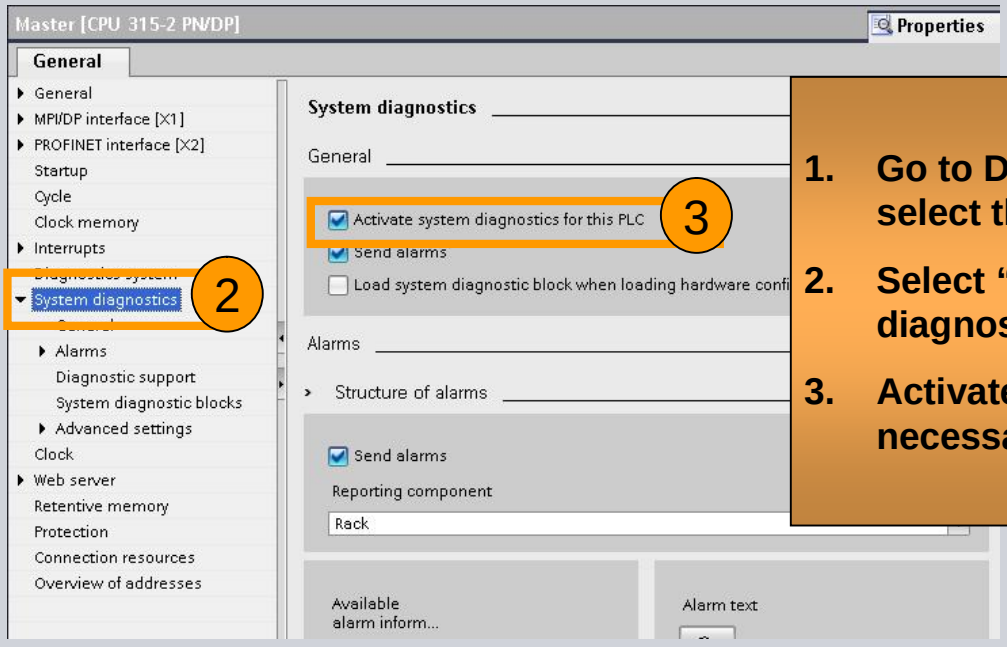
Exercise 4: Diagnostic





1. **Go to Device View and select the Controller**
2. **Select “System diagnostics”**
3. **Activate it and configure if necessary**

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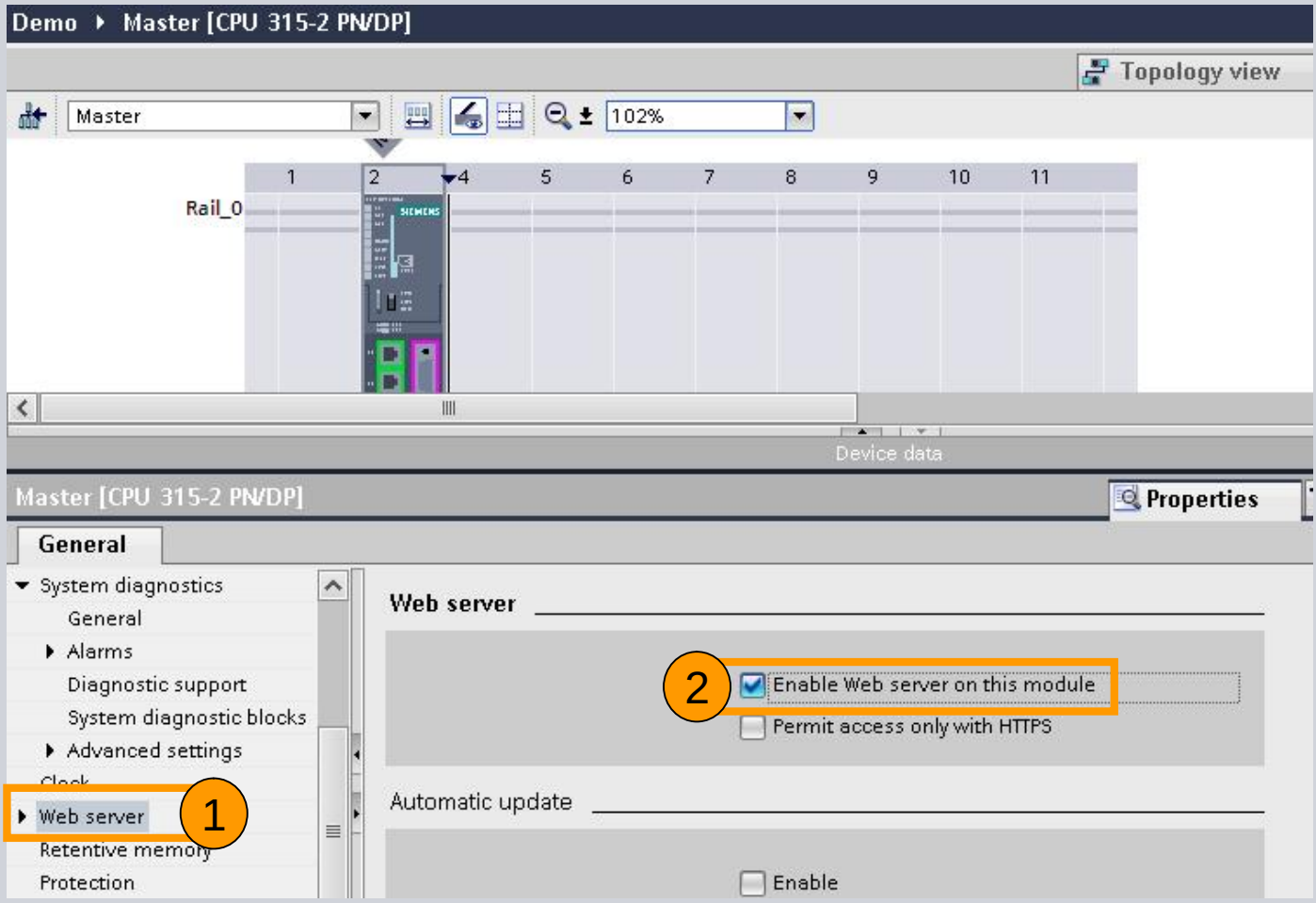
Exercise 4:
Diagnostic



1. **Select Web Interface**
2. **Activate Web Function for the PLC**

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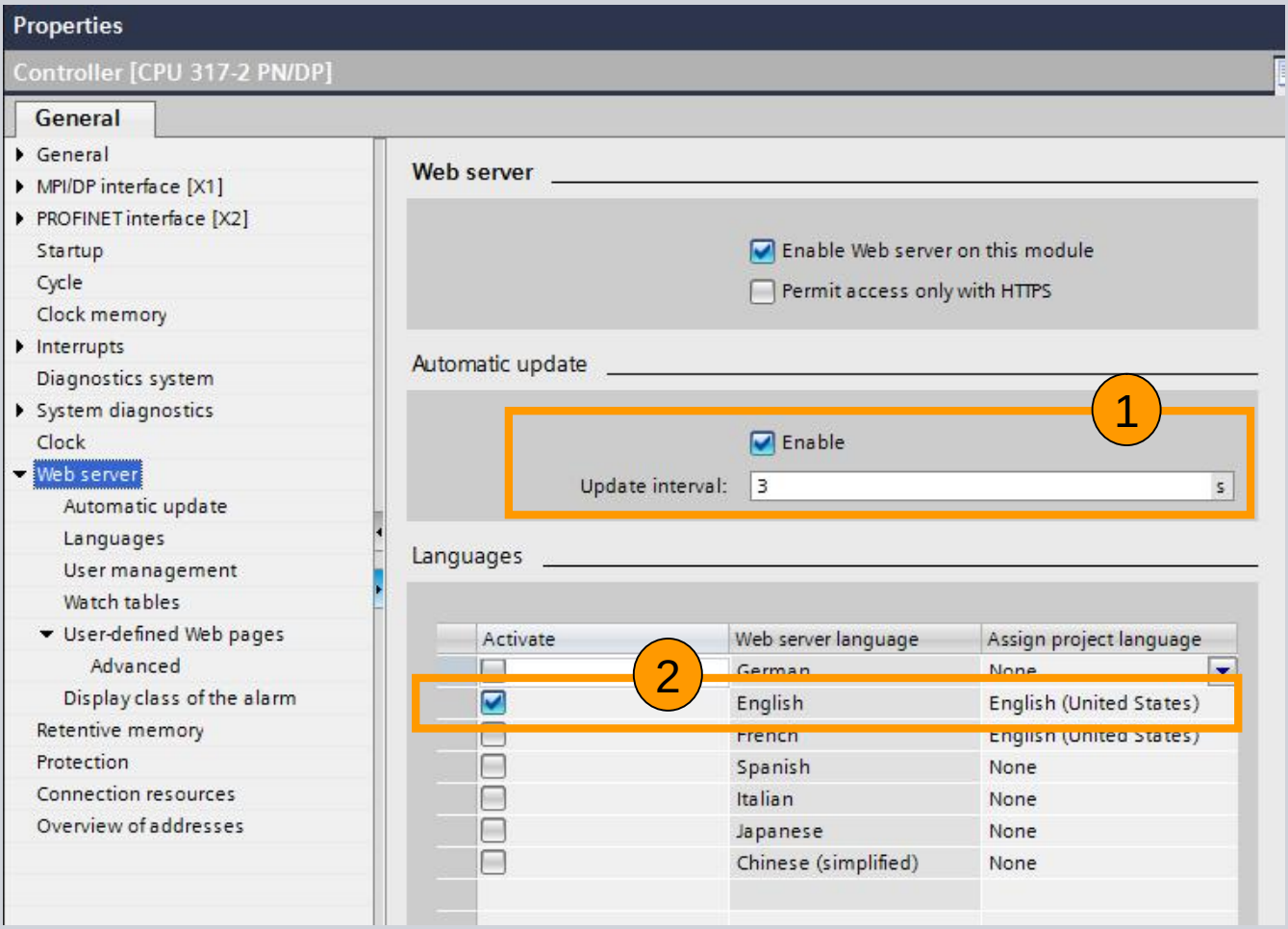
Exercise 4: Diagnostic



1. **Select Automatic Update**
2. **Select at least one language for the Web interface**

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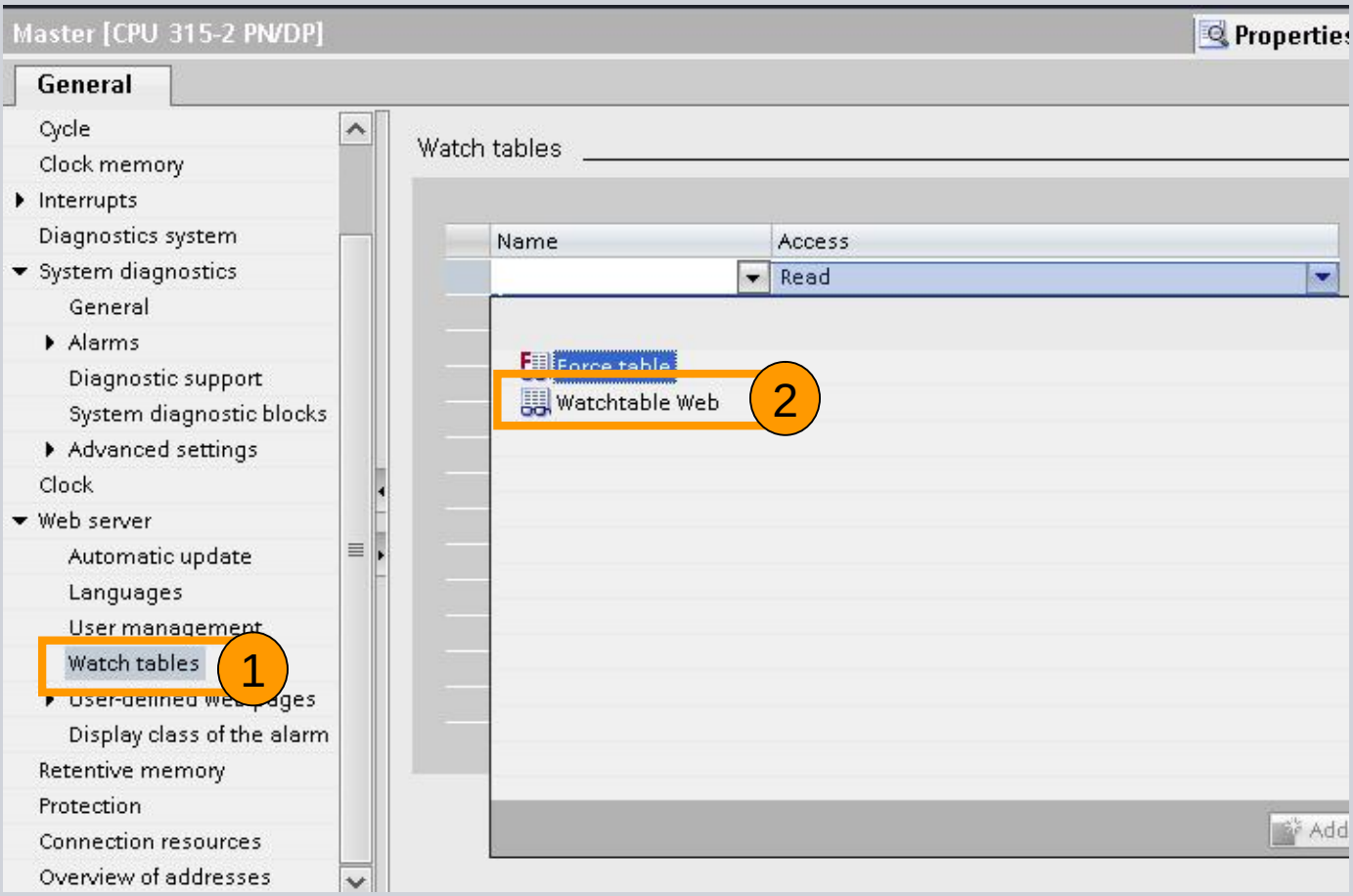
Exercise 4:
Diagnostic



1. **Select Watch table**
2. **Insert it to the Web interface**

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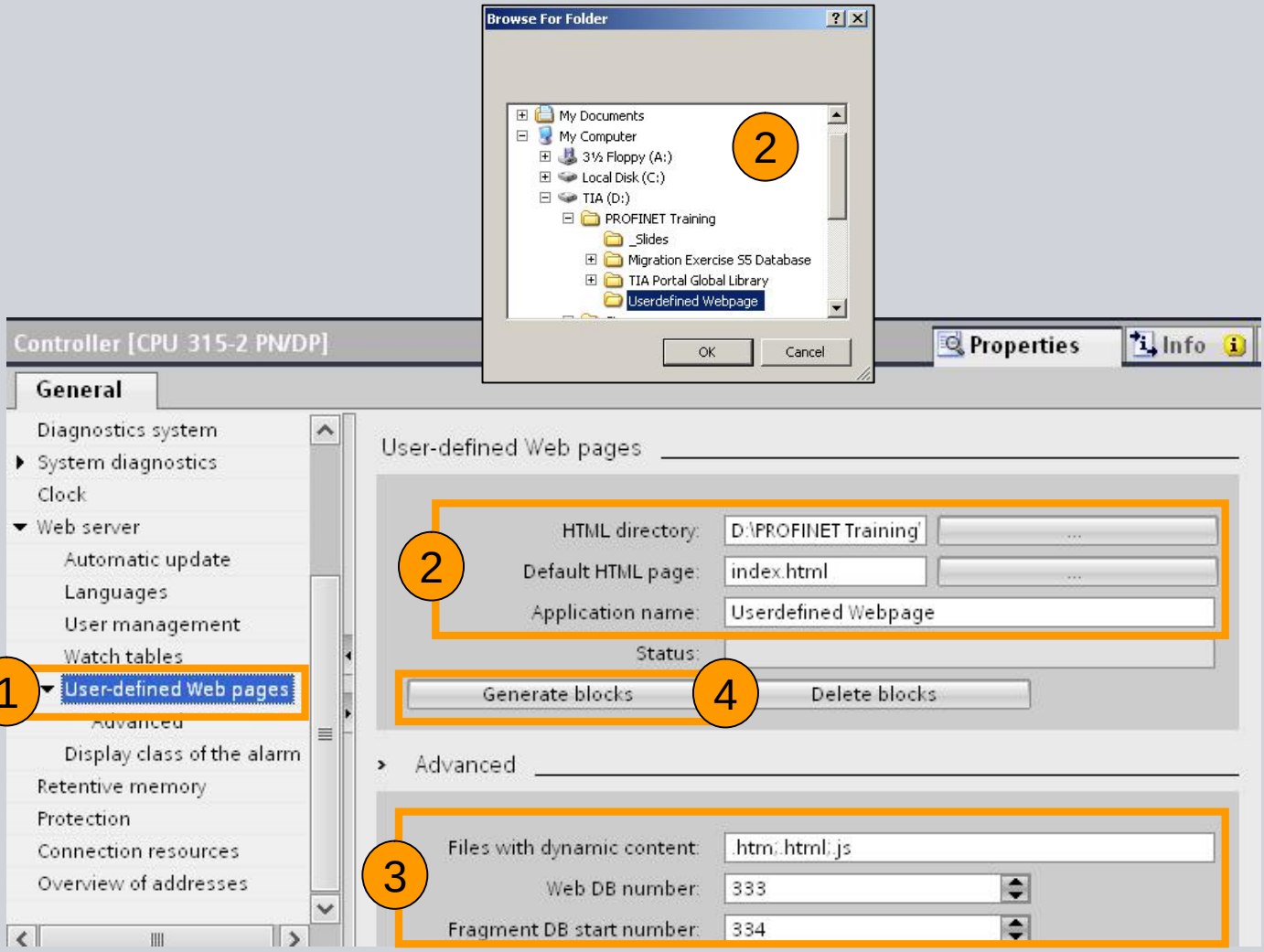
Exercise 4:
User Defined Webpage



1. **Select User-defined Web pages**
2. **Select Directory and Start page of the user page**
3. **Define DB Number start number, HTML Code will be converted into DB's**
4. **Generate the Datablocks**

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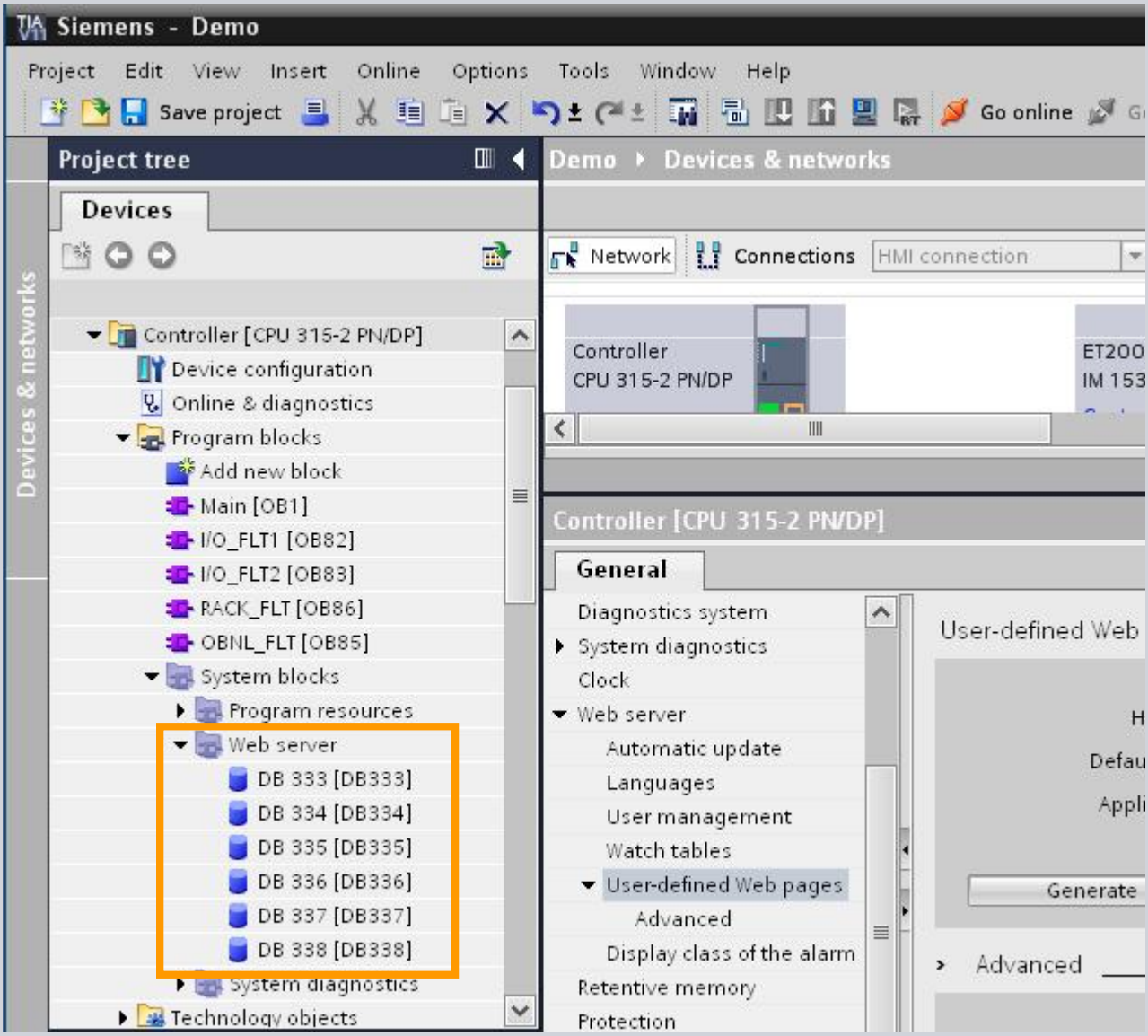
Exercise 4:
User Defined Webpage



1. **Web DBs are created for the Web server**

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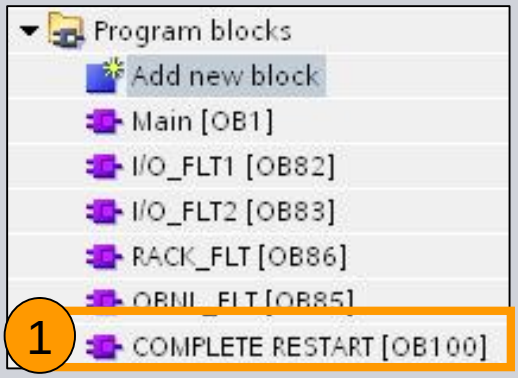
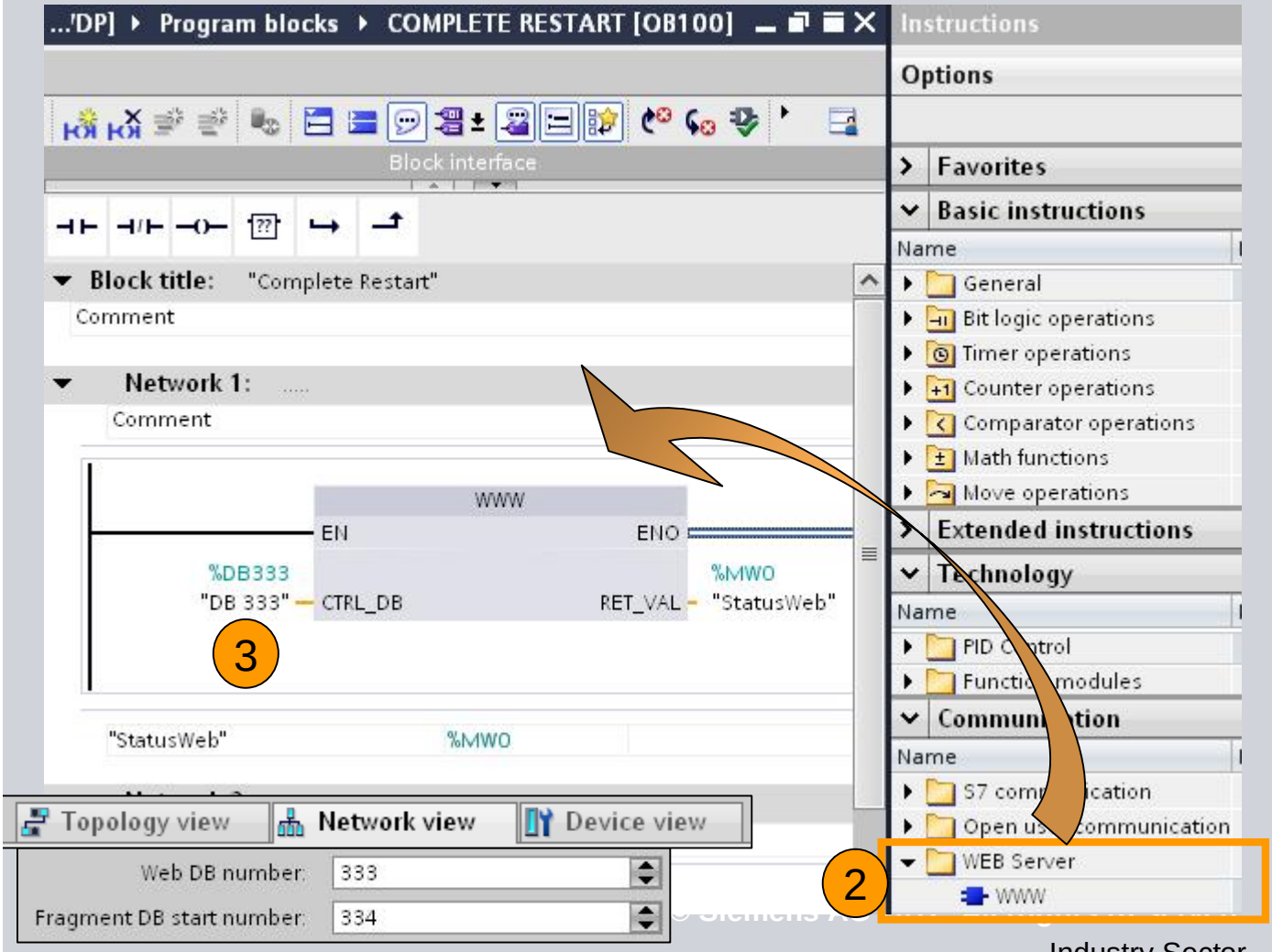
Exercise 4:
User Defined Webpage



1. **Create Startup OB 100**
2. **Call Web Server SFC (WWW)**
3. **Define Ctrl DB and Status**



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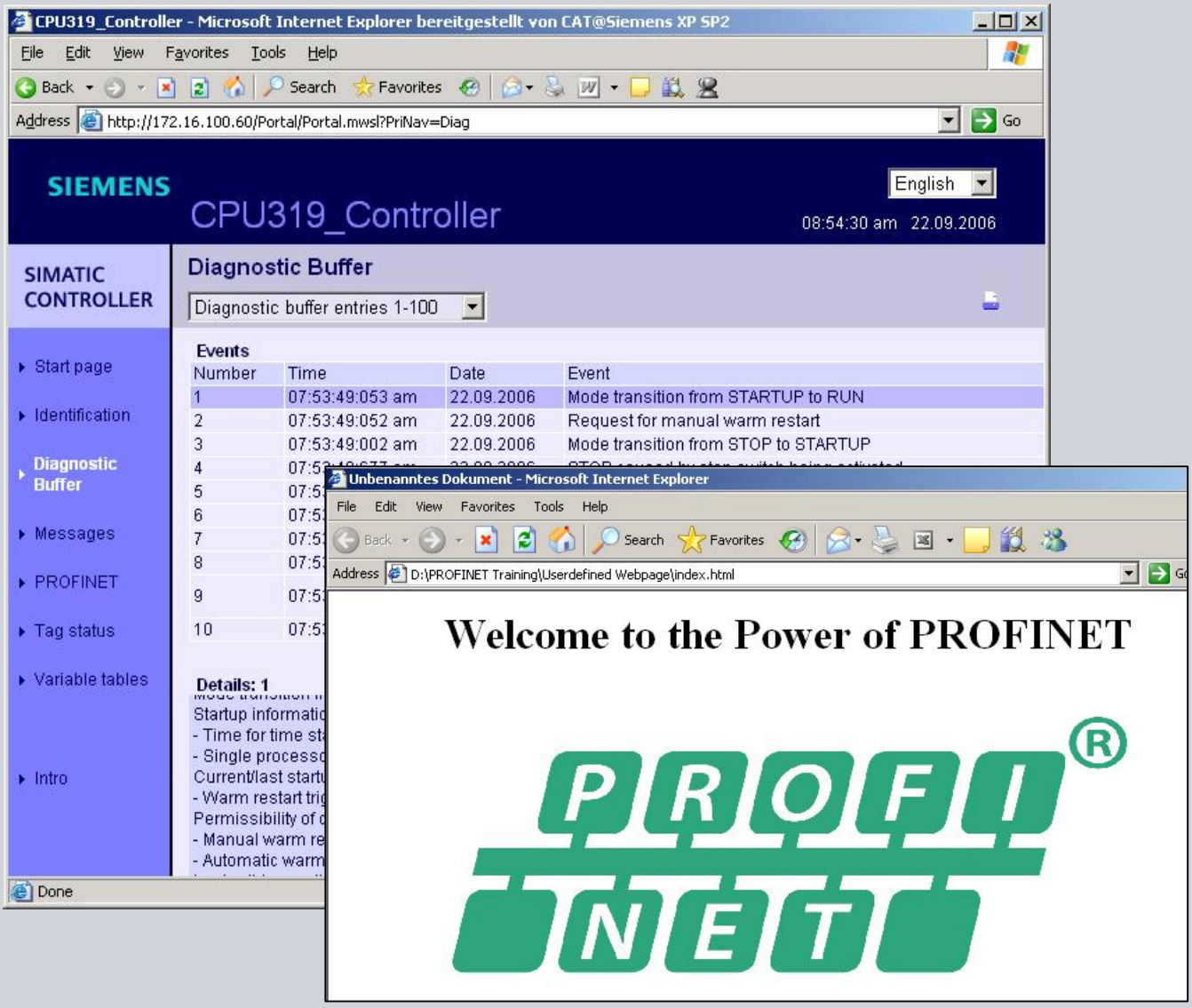
Exercise 4:
User Defined Webpage

1. Download and test



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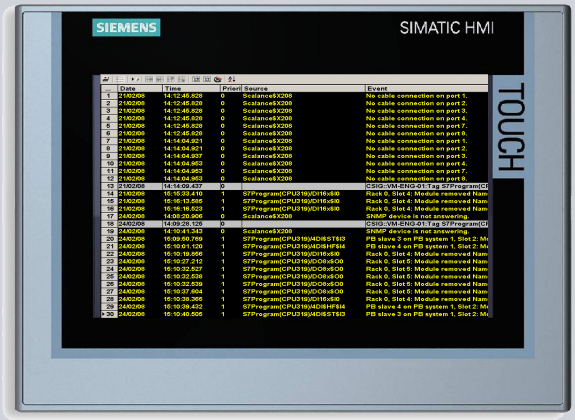
Exercise 5:
Diagnostic / Panel

1. Insert the Panel in your Project
2. Insert a Screen or Screenlayout
3. Insert the Diagnostic View in your Screen
4. Test



Exercise 5:
Diagnostic / Panel

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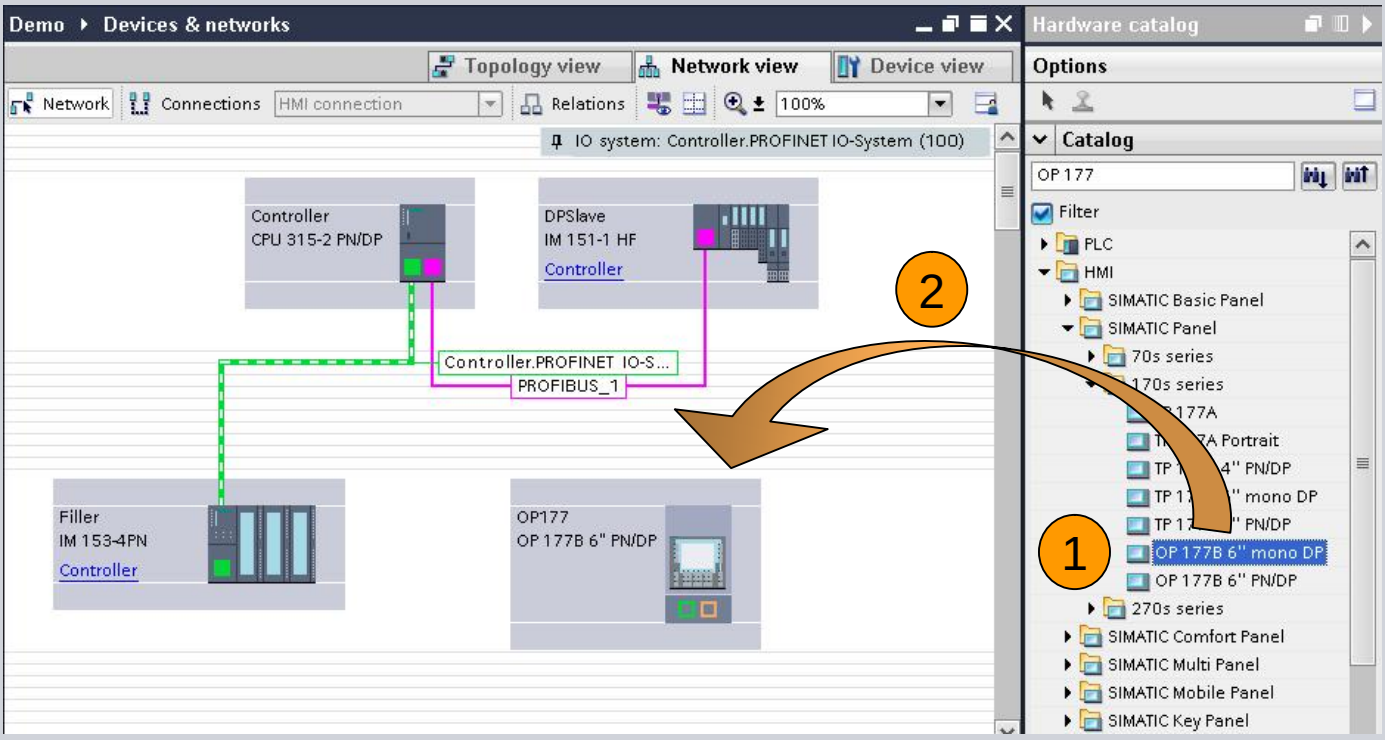
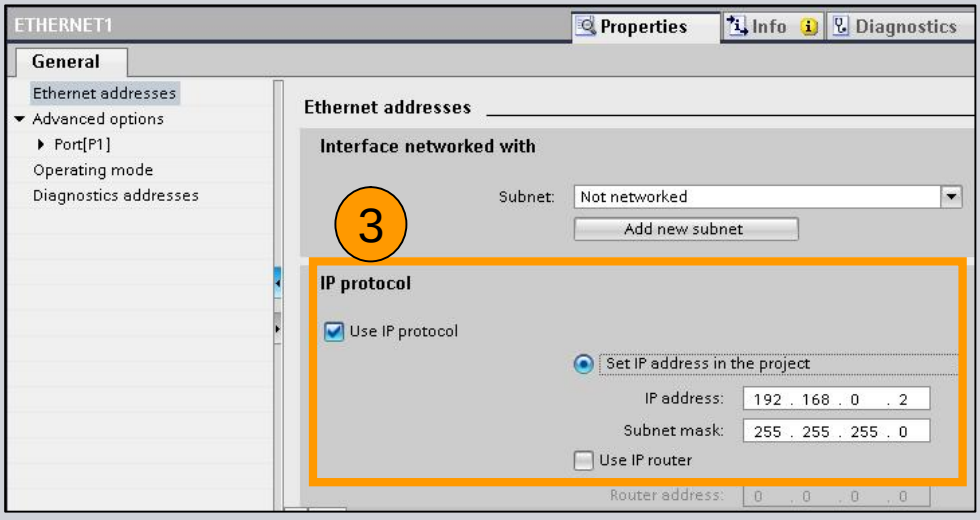
Possibility 1





1. **Select Panel**
2. **Drag and Drop to your Network View**
3. **Adjust IP-Settings if required**

Exercise 5:
Diagnostic / Panel

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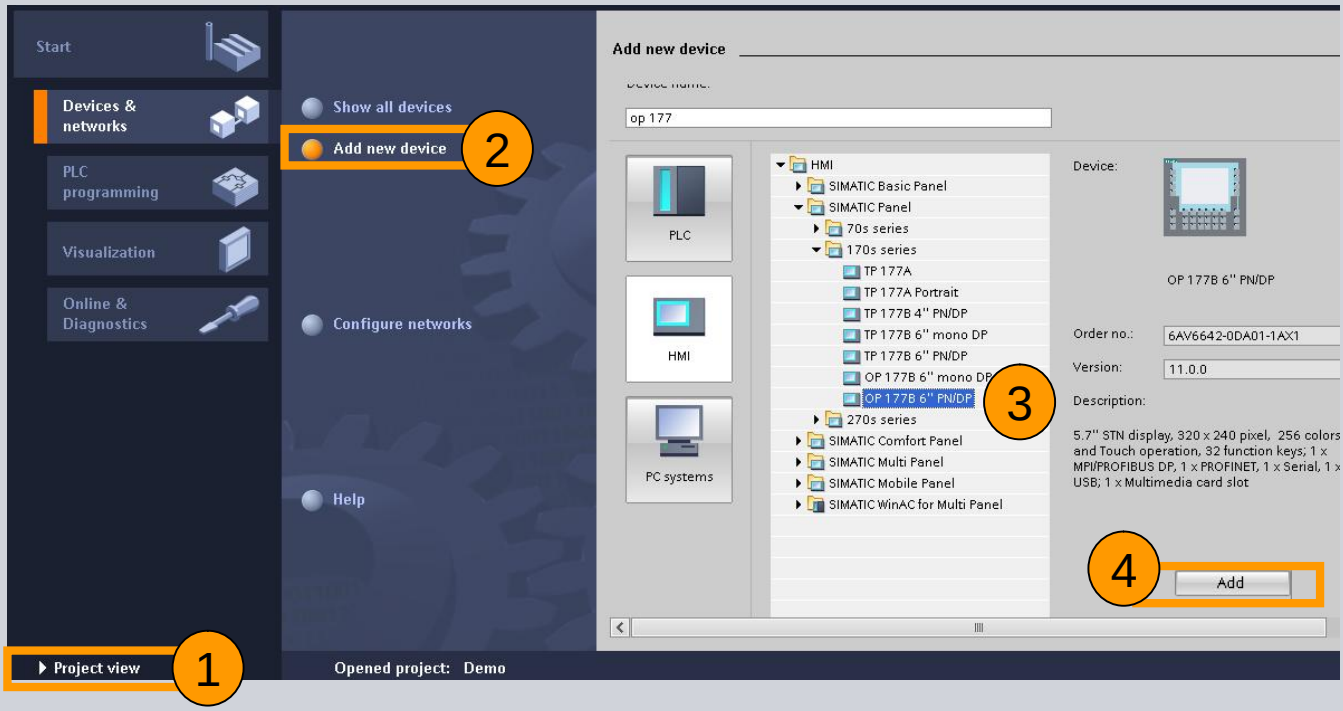
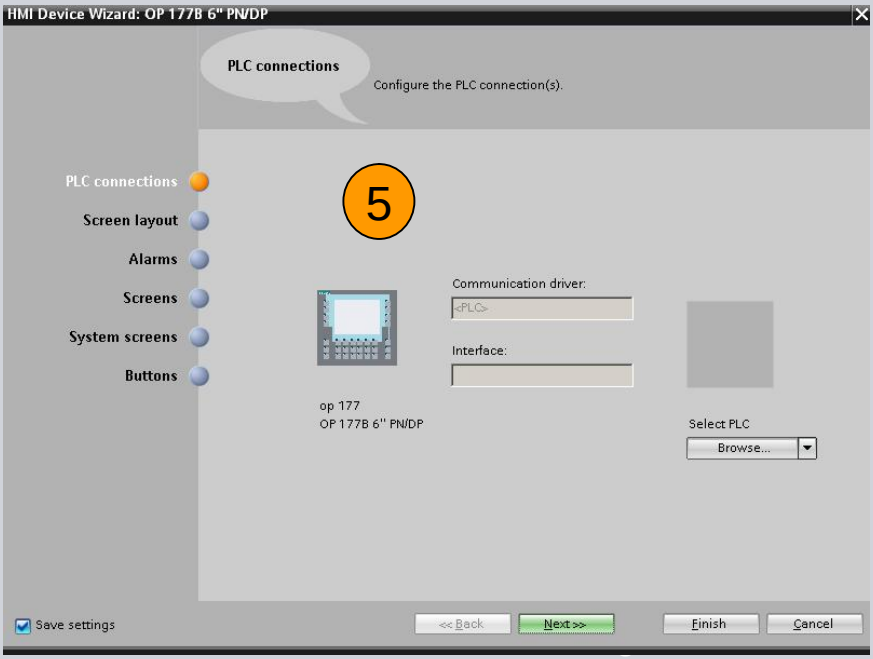
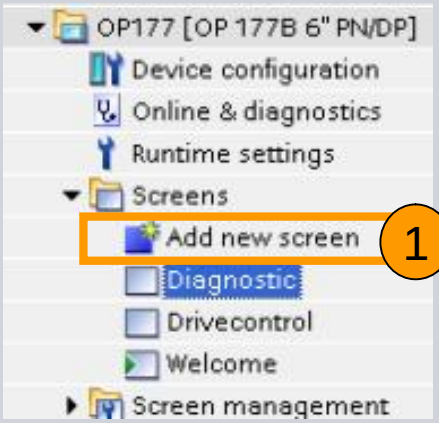
Possibility 2

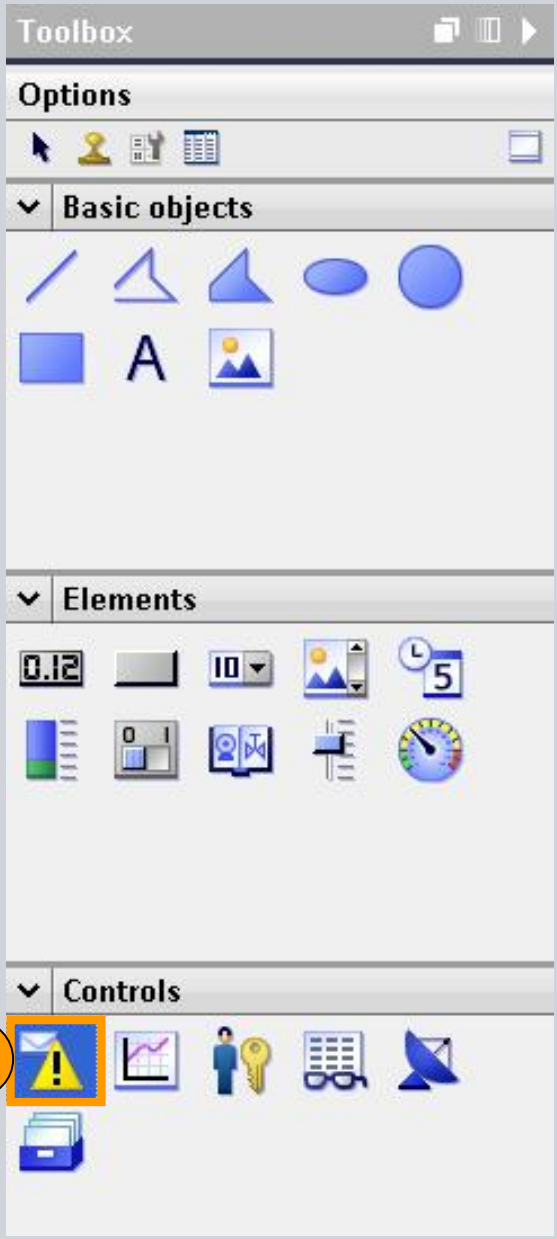


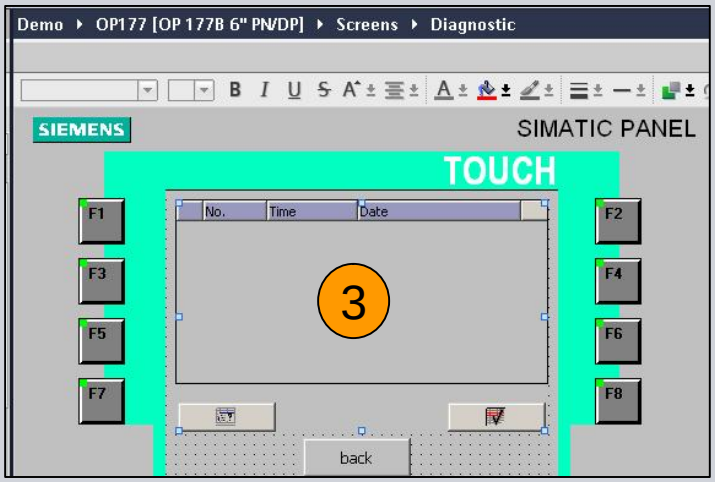
1. **Change to Portal View**
2. **Add new device**
3. **Select HMI**
4. **Add**
5. **Pre-configuration via Wizard is possible.**



Exercise 5:
Diagnostic Standard Panel

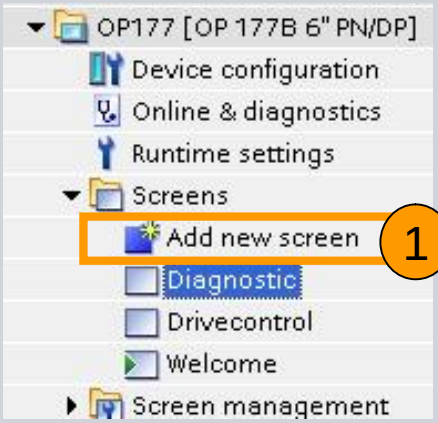


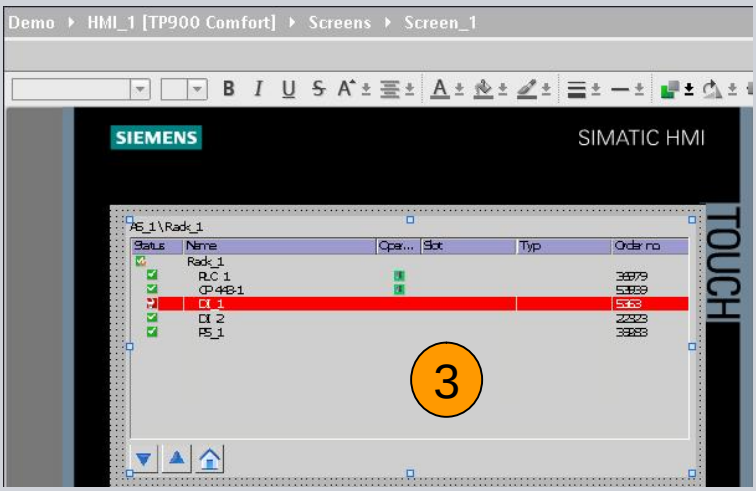


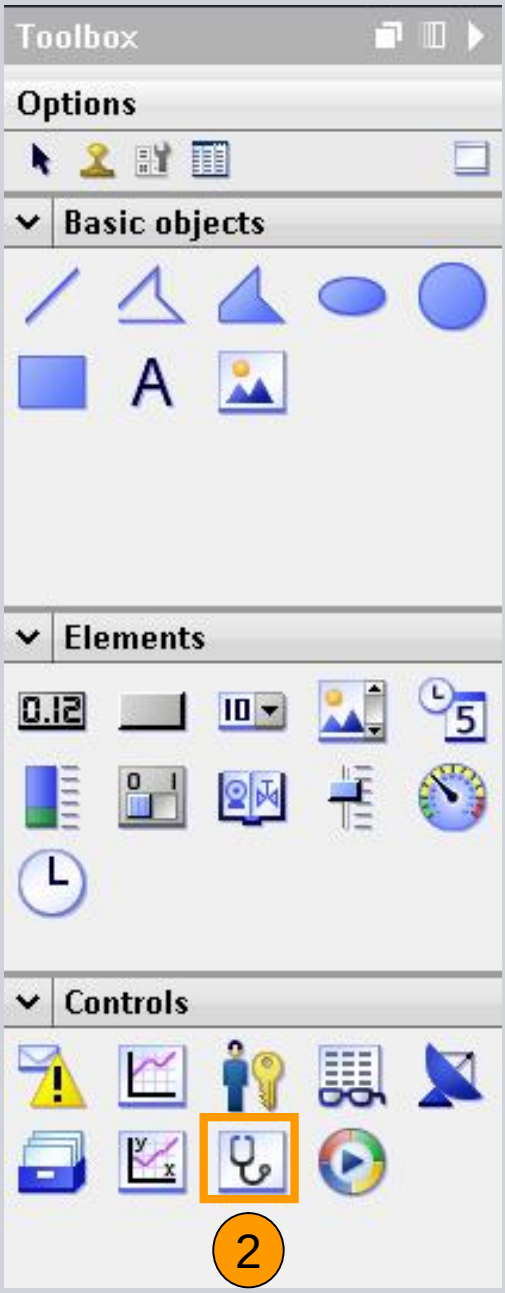


1. **Select the Panel in “Project view” and add a new screen**
2. **Select Alarm View**
3. **Bring it to your screen**

Exercise 5:
Diagnostic for Comfort Panel







1. **Add new screen**
2. **Besides “Alarm View” it is possible to select “System Diagnostic view” (Only available on Comfort Panel)**
3. **Bring it to your comfort panel screen.**

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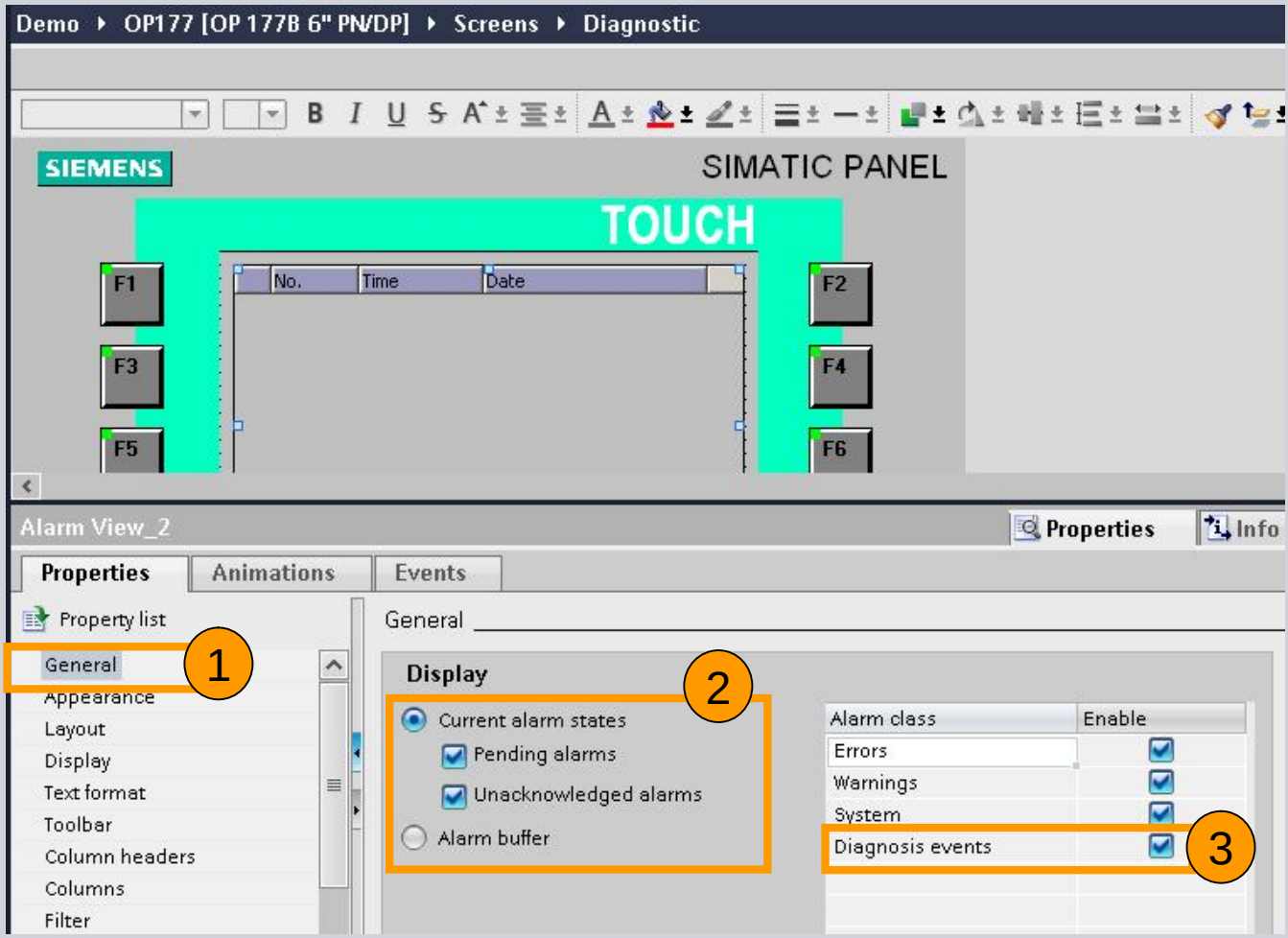
Exercise 5:
Diagnostic / Panel



1. **Go to Properties**
2. **Activate for “Current Alarm States”**
3. **Activate “Diagnosis events”**

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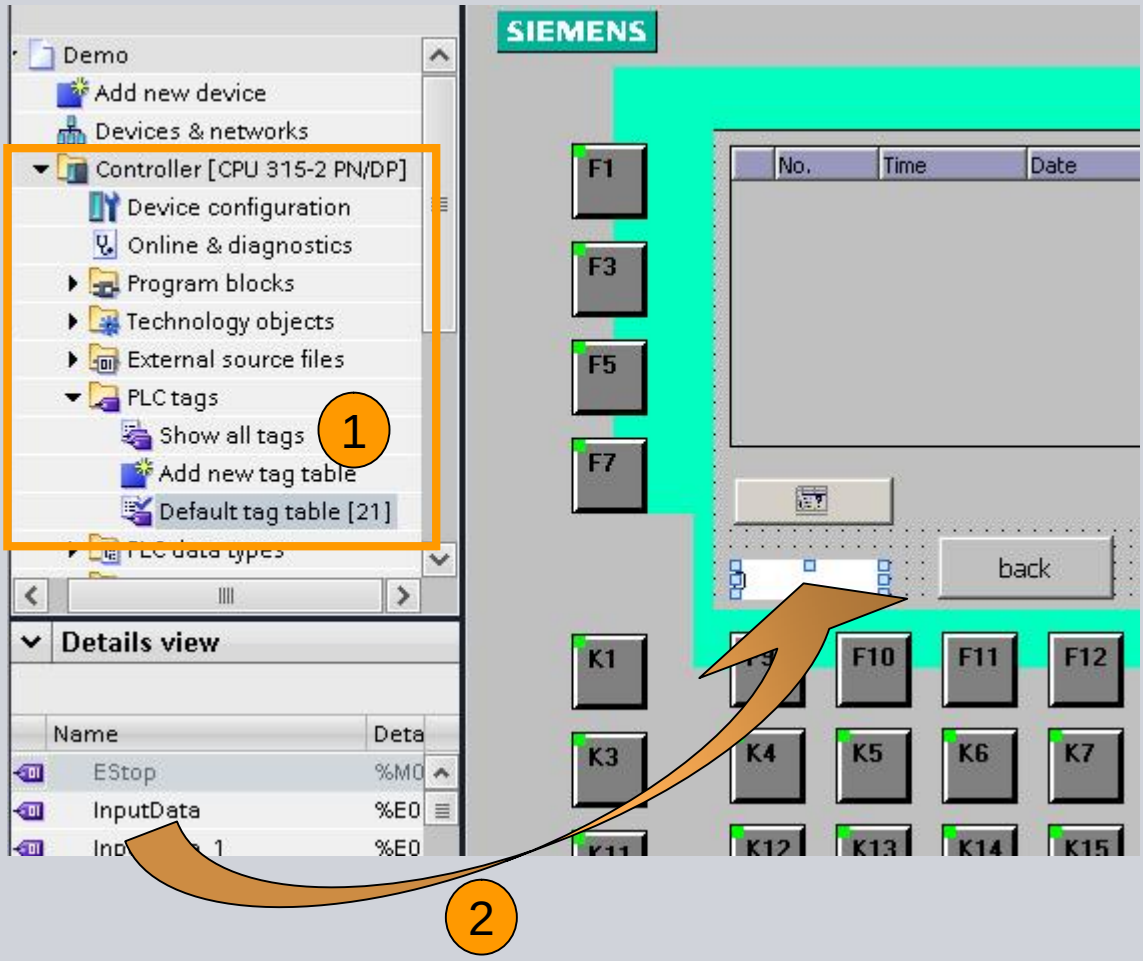
Exercise 5:
Diagnostic / Panel



1. **Select your PLC Tags**
2. **You will see them in “Details View”**
3. **Drag & Drop a Variable to your screen, it will become automatically an IO Field.**
4. **The Connection between Panel and PLC is now configured!**

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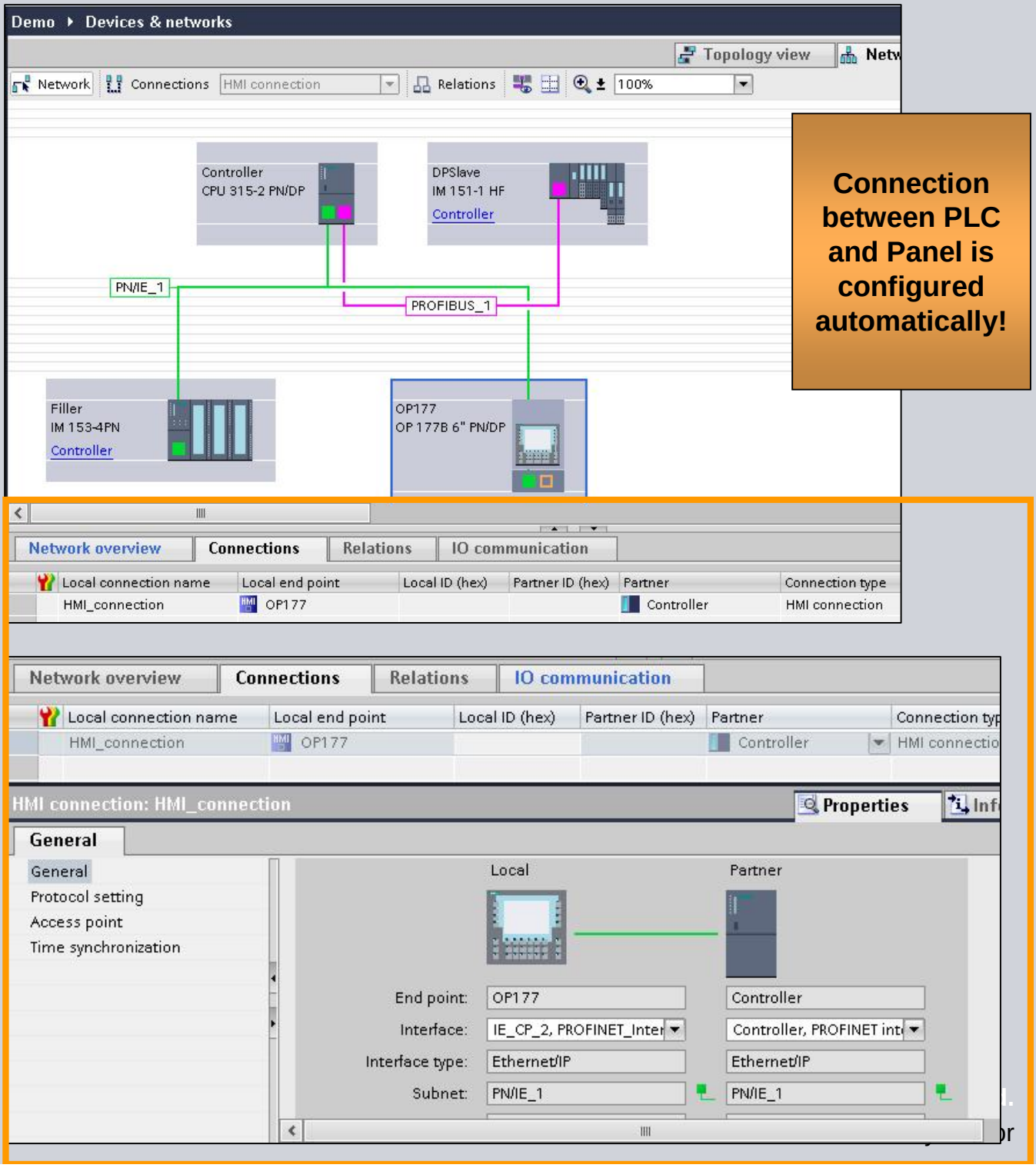
Exercise 5:
Diagnostic / Panel



Connection between PLC and Panel is configured automatically!

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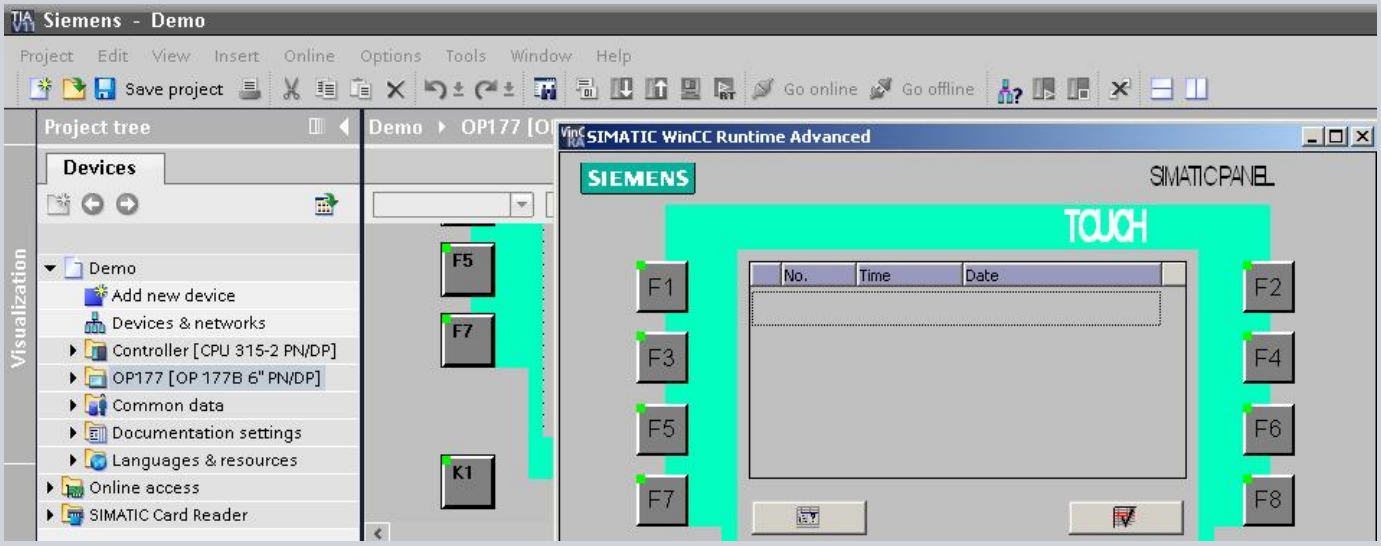
Exercise 5:
Diagnostic / Panel



1. **Compile the panel application**
2. **Download or start simulation for testing**

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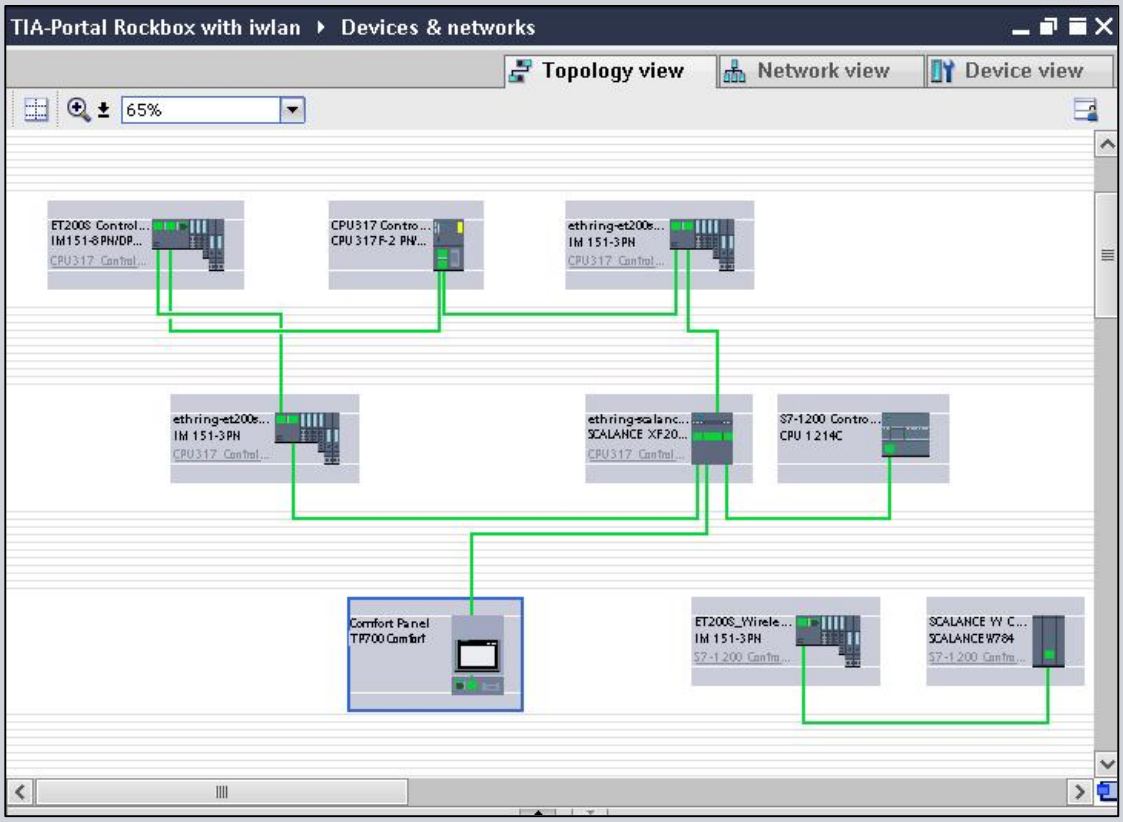
Exercise 6:
PROFINET Redundancy

1. Configure Topology
2. Define MRP-Manager and MRP-Clients
3. Test



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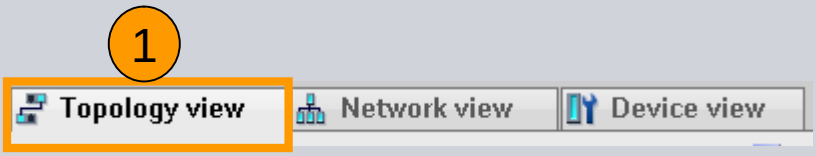
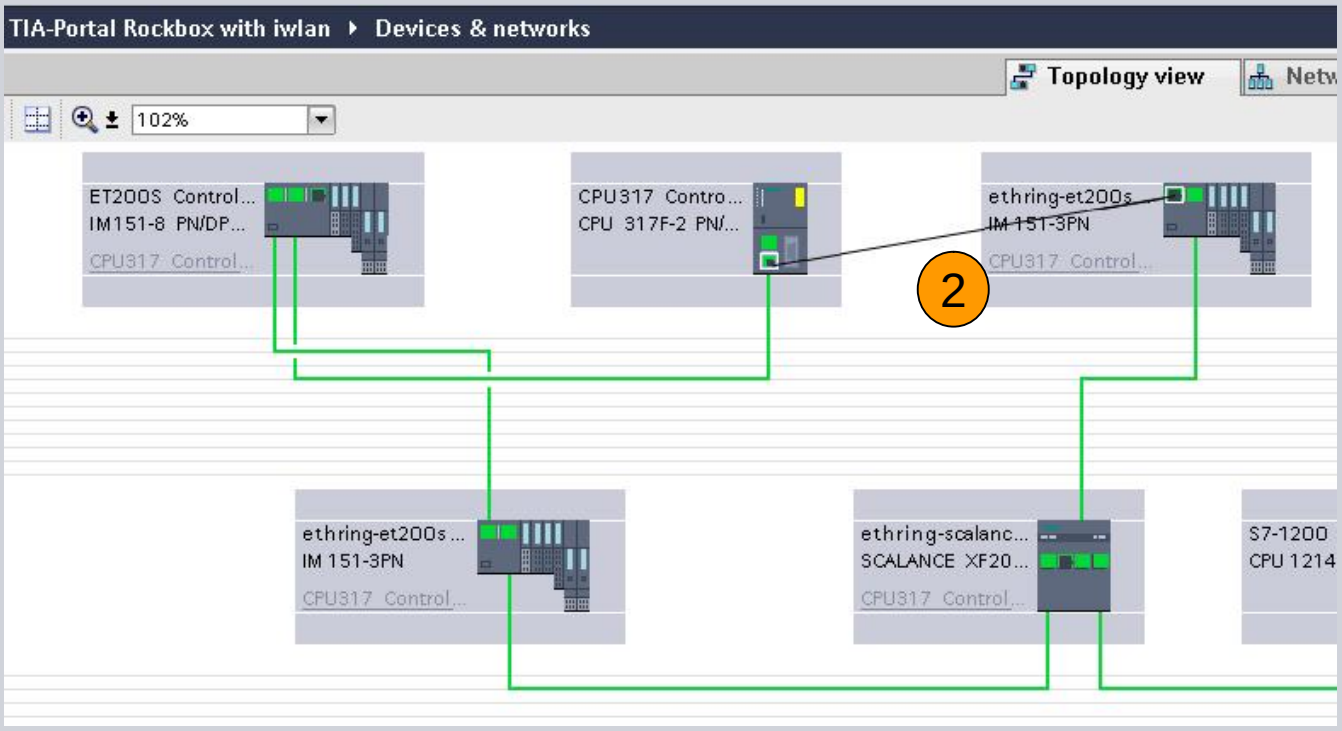
Exercise 6:
PROFINET Redundancy





1. **Change to topological view**
2. **Configure the Port interconnections**

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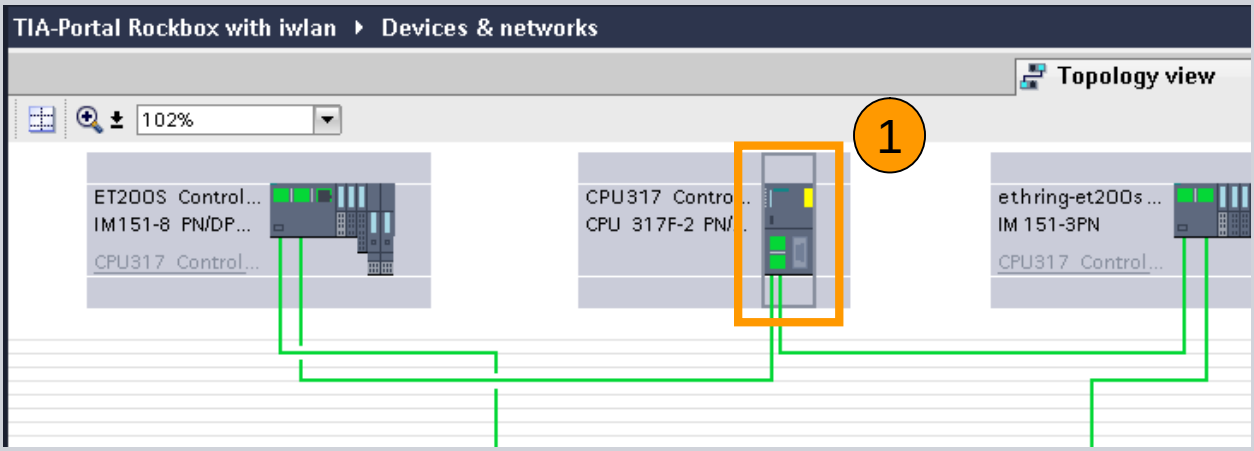
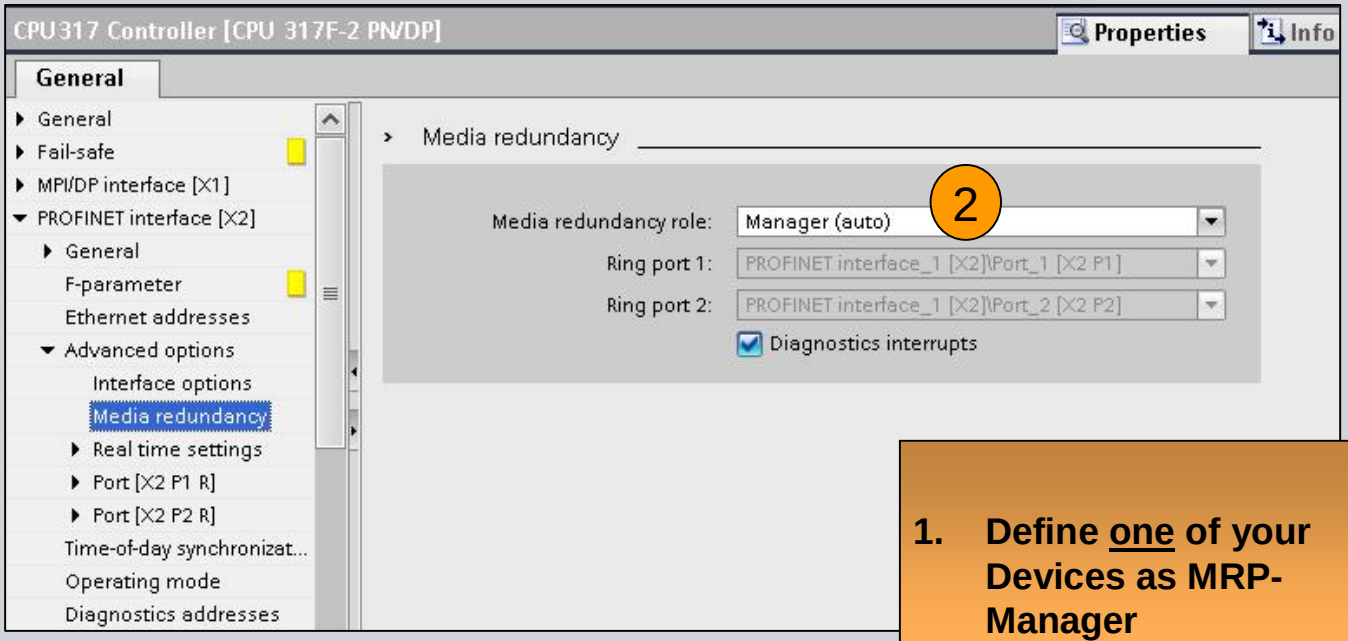
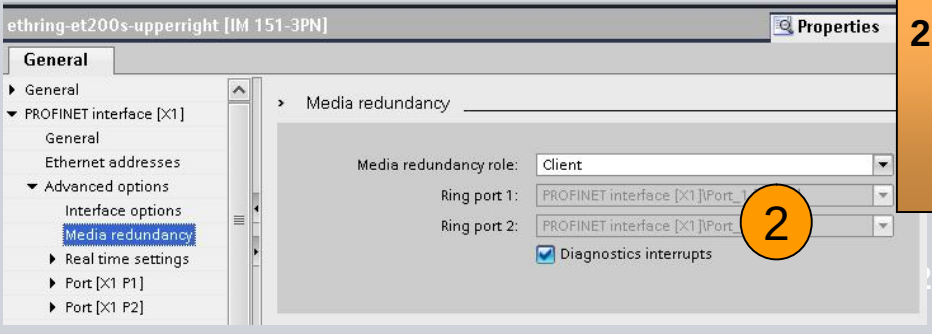
Exercise 6:
PROFINET Redundancy







1. **Define <u>one</u> of your Devices as MRP-Manager**
2. **All the other devices in the Ring-Network as MRP-Client**

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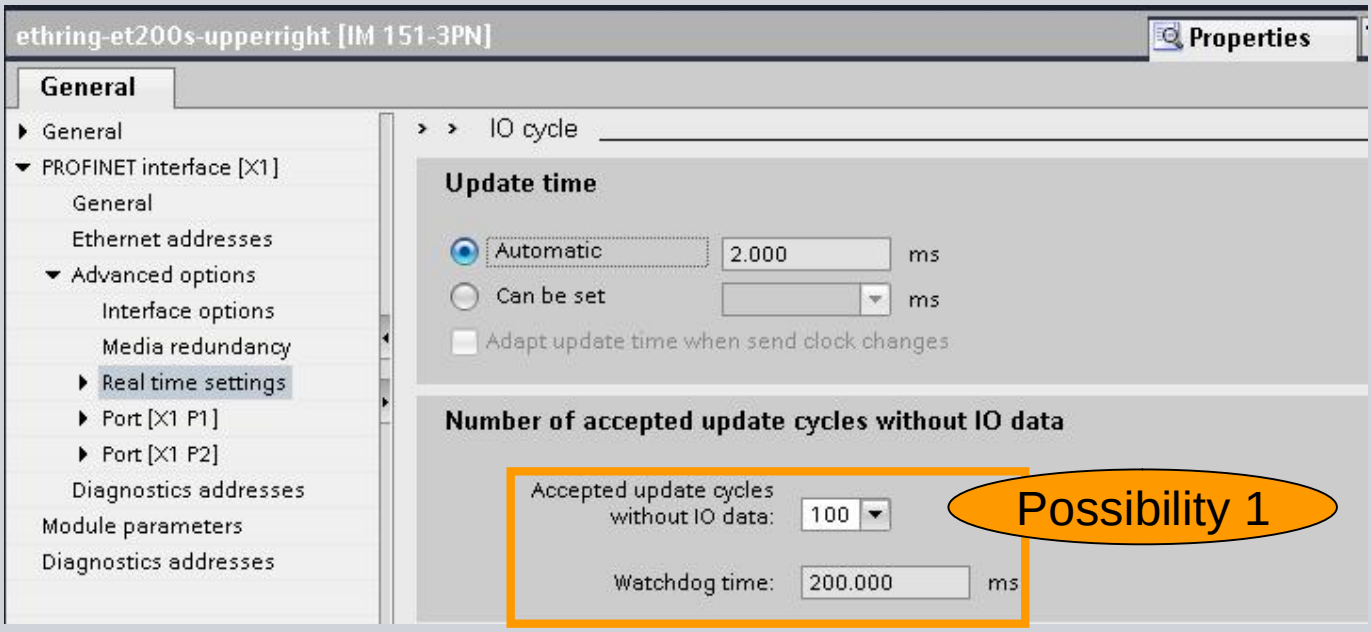
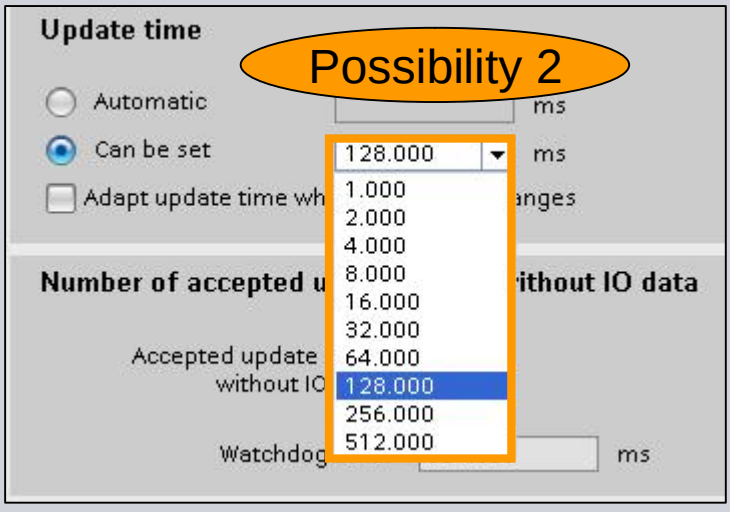
Exercise 6:
PROFINET Redundancy





1. **Adjust the time behavior of your IO-Devices in the Ring that a Watchdog of 200ms is configured!**

   Reason: MRP (Media Redundancy Protocol) max. Reconfiguration time is 200ms.

   If this parameter will not be changed, the IO-Device will drop off the network when Redundancy switchover occurs!

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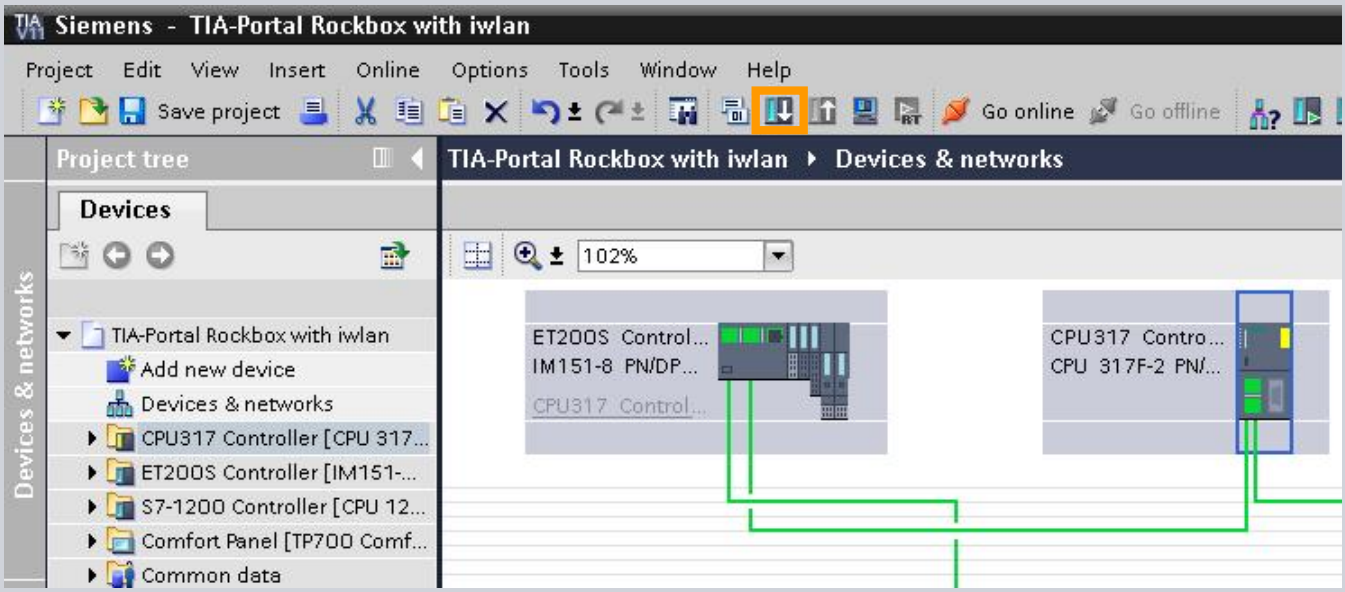
Exercise 6:
PROFINET Redundancy



1. **Download first!!!**
2. **Connect the Ring topology**
3. **Test Redundancy**

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Congratulation, you made it!!

Industry Sector

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Thank you for your attention!

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