

SIEMENS

Exercise

The Siemens logo is displayed in a bold, teal, sans-serif font in the upper right corner of the page. The background of the page is a dark grey-blue gradient, with a vertical strip on the left side showing a close-up of a network switch port with a green Ethernet cable plugged in. The word 'SIEMENS' is visible on the switch face and the cable connector.

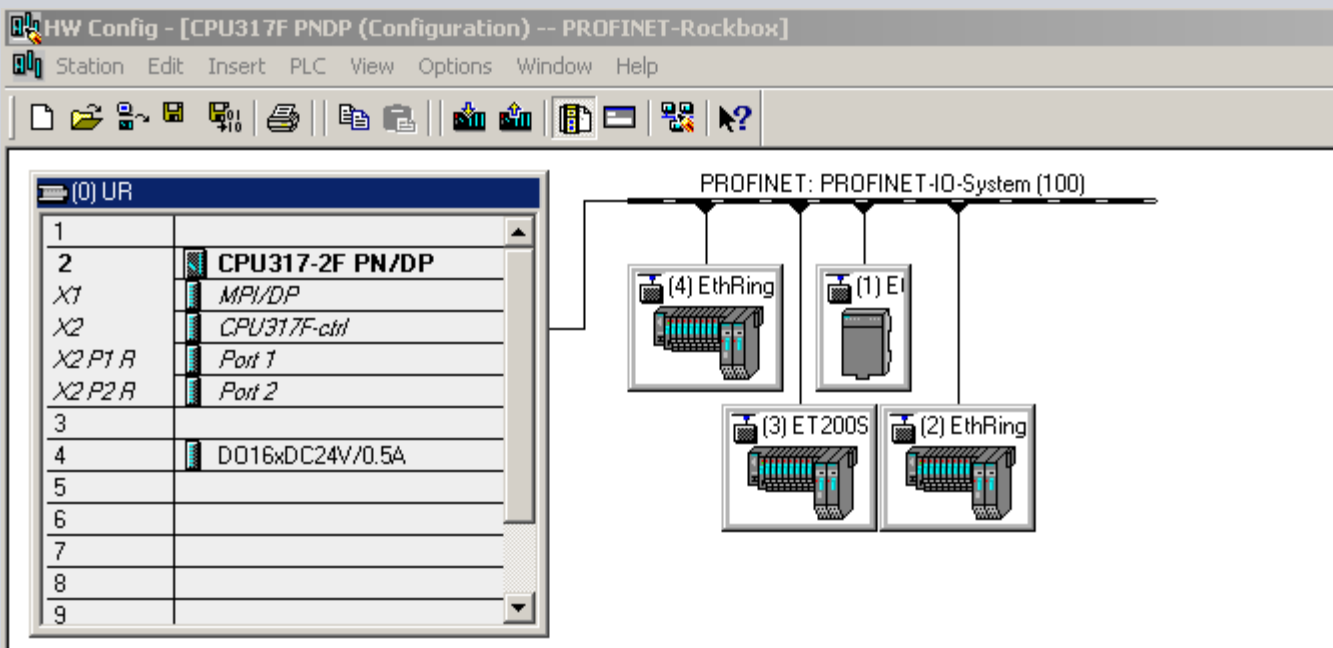
SIEMENS

Exercise 1

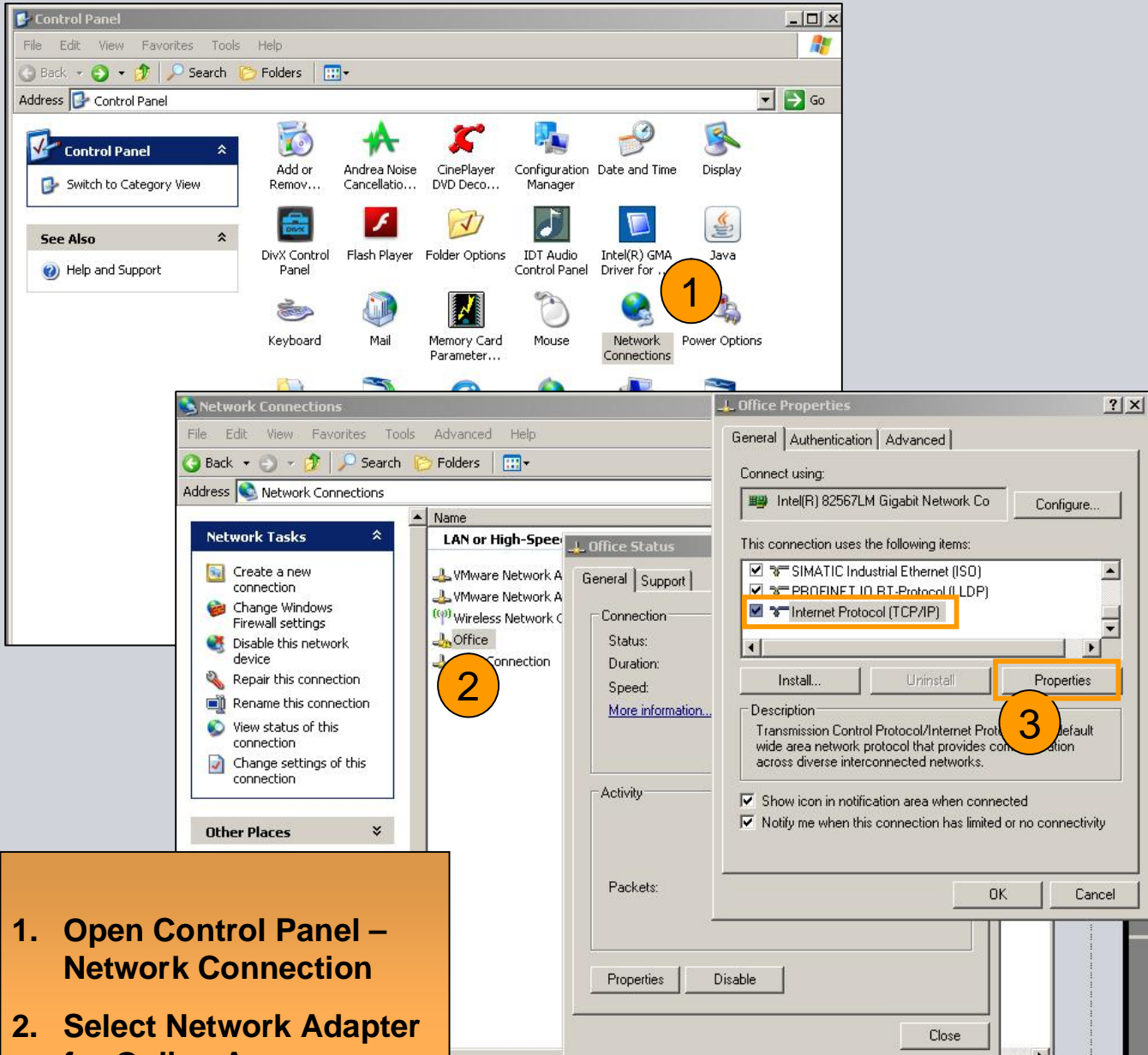
PROFINET IO System
Engineering with STEP7 V5.5

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

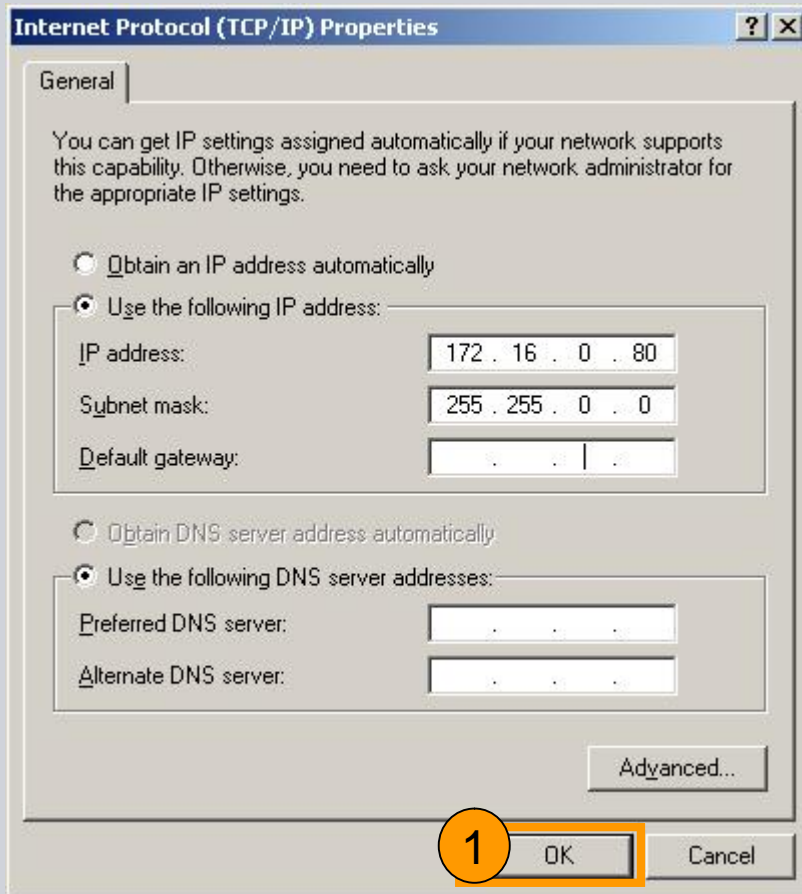


Exercise 1: Assign IP-Address



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

Exercise 1: Assign IP-Address



Three Network Classes:

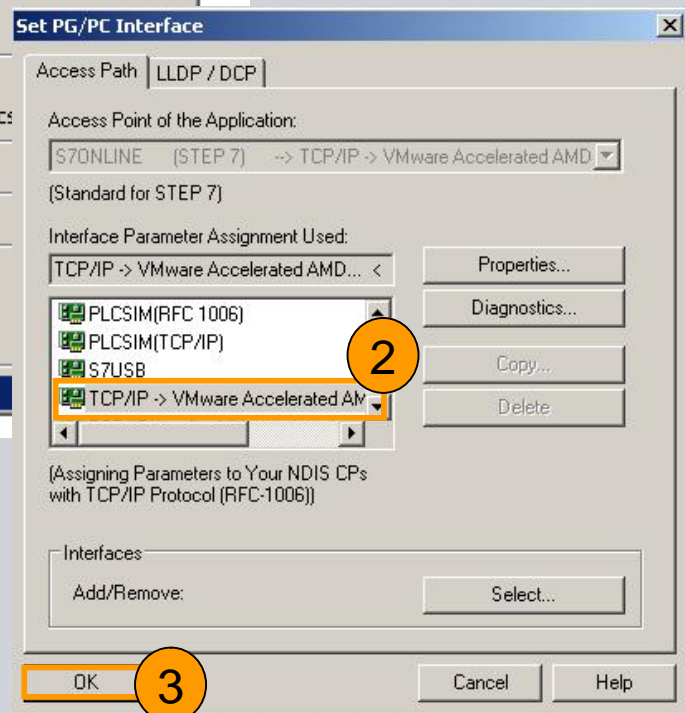
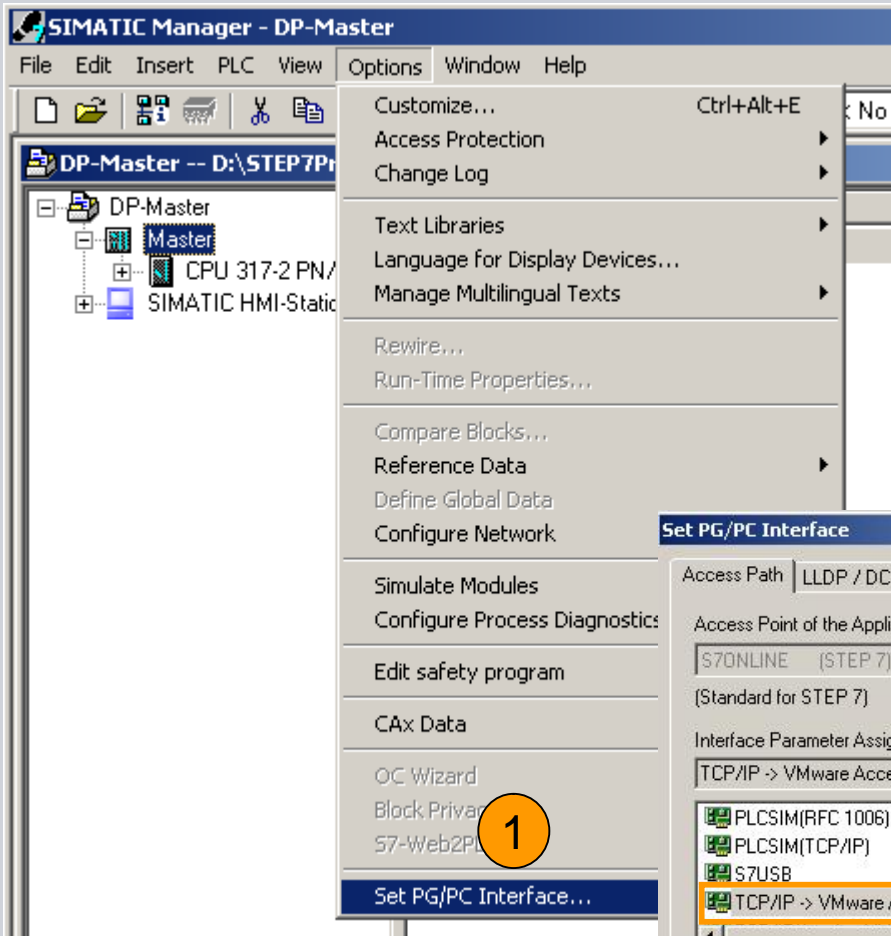
Class A: 1.0 - 127.0
Subnet: 255.0.0.0

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

Exercise 1: Assign IP-Address

1. Open Browse Dialog

2. Browse Ethernet Network

3. Identify Device and assign IP-Address

4. OK

The screenshot shows the SIMATIC Manager interface with the 'Edit Ethernet Node' dialog box open. The 'Browse Network' dialog is also open, displaying a list of nodes. The '0.0.0.0' IP address is selected in the list, and the 'OK' button is highlighted.

IP address	MAC address	Device type	Name
0.0.0.0	00-0E-8C-CB-D6-68	ET 200S	
172.16.0.1	00-0E-8C-D4-73-C7	SCALANCE...	ethring-sc
172.16.0.11	00-1C-06-02-2B-C7	S7-1200	s7-1200x
172.16.0.12	08-00-06-97-BA-D2	SCALANCE...	PNIO_WI
172.16.0.20	00-0E-8C-CB-D6-75	ET 200S	ethring-et
172.16.0.40	00-0E-8C-CC-BF-F8	IM151-8F P...	et200sxa
172.16.0.80	00-0E-8C-F8-69-64	HMI	comfortx

Exercise 1: Assign IP-Address

Edit Ethernet Node [X]

Ethernet node

MAC address:

Nodes accessible online

Set IP configuration

Use IP parameters

IP address: Gateway: Do not use router

Subnet mask: Use router

Address:

Obtain IP address from a DHCP server

Identified by

Client ID MAC address Device name

Client ID: **1**

Assign device name

Device name:

Reset to factory settings

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

```

c:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\time_limited_user>ping 172.16.0.30

Pinging 172.16.0.30 with 32 bytes of data:

Reply from 172.16.0.30: bytes=32 time=3ms TTL=30
Reply from 172.16.0.30: bytes=32 time=1ms TTL=30
Reply from 172.16.0.30: bytes=32 time=5ms TTL=30
Reply from 172.16.0.30: bytes=32 time<1ms TTL=30

Ping statistics for 172.16.0.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 2ms

C:\Documents and Settings\time_limited_user>
    
```

2

Exercise 1: PROFINET

The screenshot shows the HW Config software interface for a SIMATIC Manager project. The main window displays a rack configuration for a CPU317F PN/DP. The rack slots are as follows:

Slot	Module
1	CPU317F PN/DP
X1	MPU/DP
X2	CPU317F-ctrl
X2.P1.R	Port 1
X2.P2.R	Port 2
3	
4	DO16xDC24V/0.5A
5	
6	
7	
8	
9	

Below the rack configuration, a table shows the details for the selected IM151-3PN module:

Slot	Mo...	Order number	I address	Q address	Diagnostic address	Comment	Ac...
0	IM151-3PN	6ES7 151-3BA2			8184*		Full
X1	PN-IO				8183*		Full
X1.A	Port 1				8186*		Full
X1.B	Port 2				8185*		Full
1							

The component tree on the right side of the window shows the following structure:

- PROFIBUS DP
- PROFIBUS PA
- PROFINET IO
 - Additional Field Device
 - Drives
 - Gateway
 - HMI
 - I/O
 - ET 200eco PN
 - ET 200M
 - ET 200pro
 - ET 200S
 - GSD
 - IM151-3 PN
 - IM151-3 PN
 - IM151-3 PN FO V4.0
 - IM151-3 PN FO V5.0
 - IM151-3 PN FO V6.0
 - IM151-3 PN FO V7.0
 - IM151-3 PN HF
 - IM151-3 PN HF V4.0
 - IM151-3 PN HF V5.0
 - IM151-3 PN HF V6.0
 - IM151-3 PN HF V6.1
 - IM151-3 PN HF V7.0

An orange arrow points from the IM151-3 device in the rack to the IM151-3 device in the component tree, with a label 'Drag & Drop' indicating the action.

Exercise 1: PROFINET

PROFINET: PROFINET-ID-System (100)

(1) IM151-3

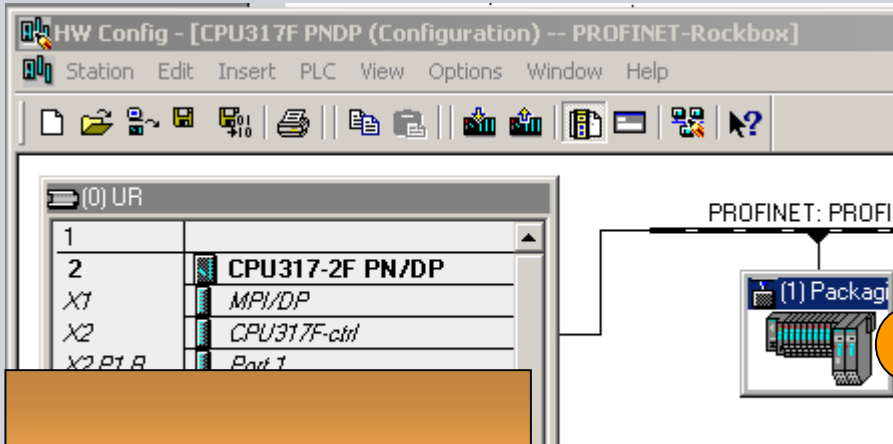
Find:

Profile: Standard

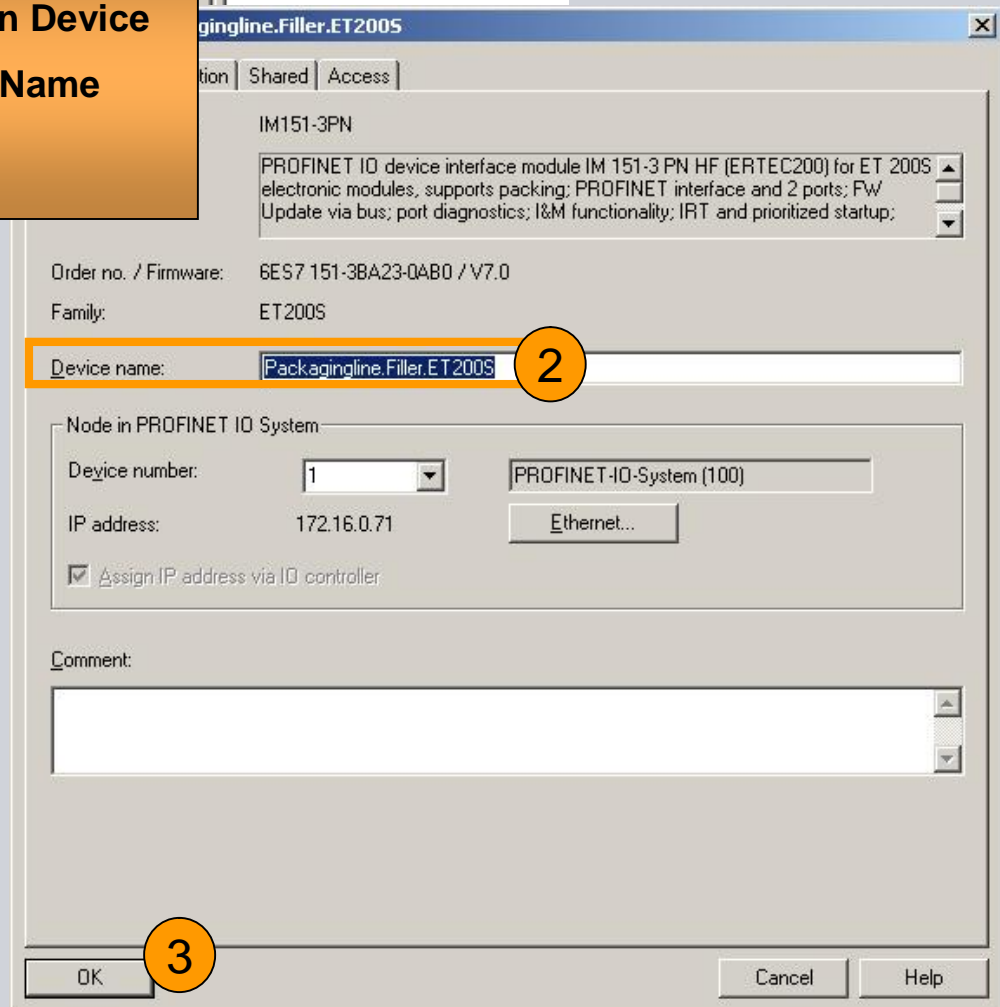
Slot	Module	Order number	I address	Q address	D...	C...	A...
0	IM151-3PN	6ES7 151-3BA23-0AB0			8184		F...
X1	PN-ID				8183		F...
X1	Port 1				8186		F...
X1	Port 2				8185		F...
1	PM-E DC24V/48V/AC24V	6ES7 138-4CB10-0AB0			8182*		F...
2	2DI DC24V/0.5A	6ES7 131-4BB01-0AA0	0.0...0.1				F...
3	4DO DC24V/0.5A HF	6ES7 132-4BD30-0AB0		2.0...2.3			F...
4	2AI RTD Pt100	6ES7 134-4NB50-0AB0	256...259				F...
5	2AO I HF	6ES7 135-4MB02-0AB0		256...259			F...
6	1 SI Modbus Master (4 B)	6ES7 138-4DF11-0AB0	260...263	260...263			F...

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

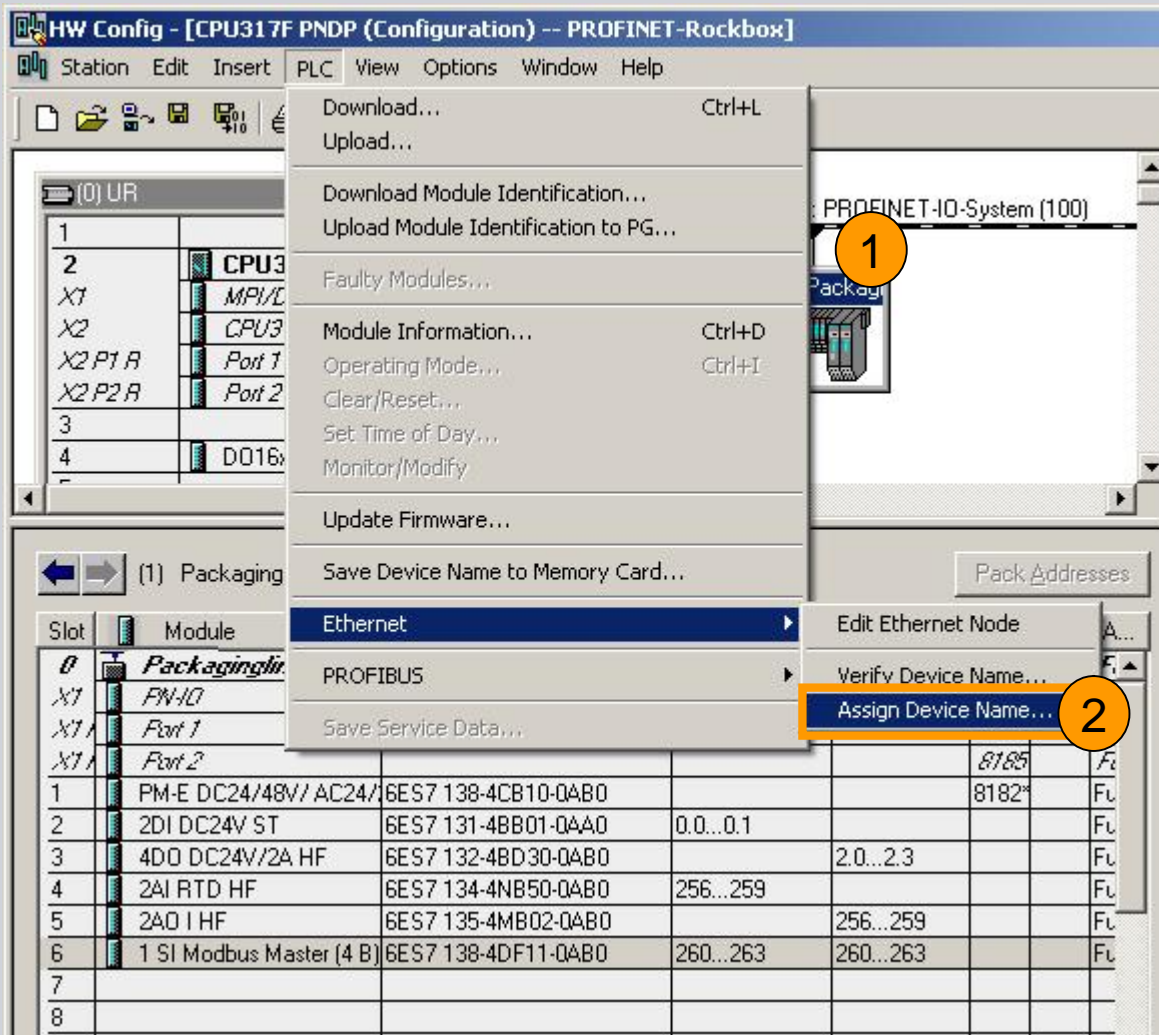
Exercise 1: PROFINET



1. Double click on Device
2. Define Device Name
3. OK

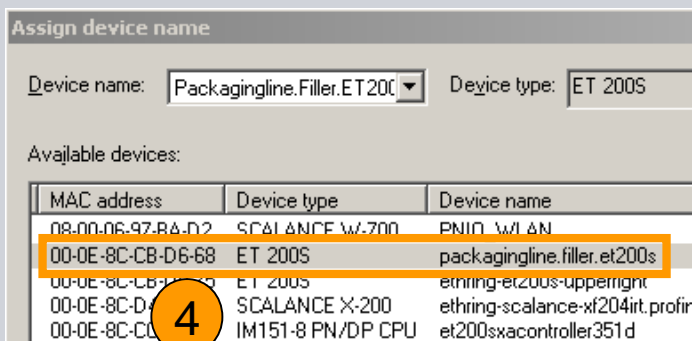
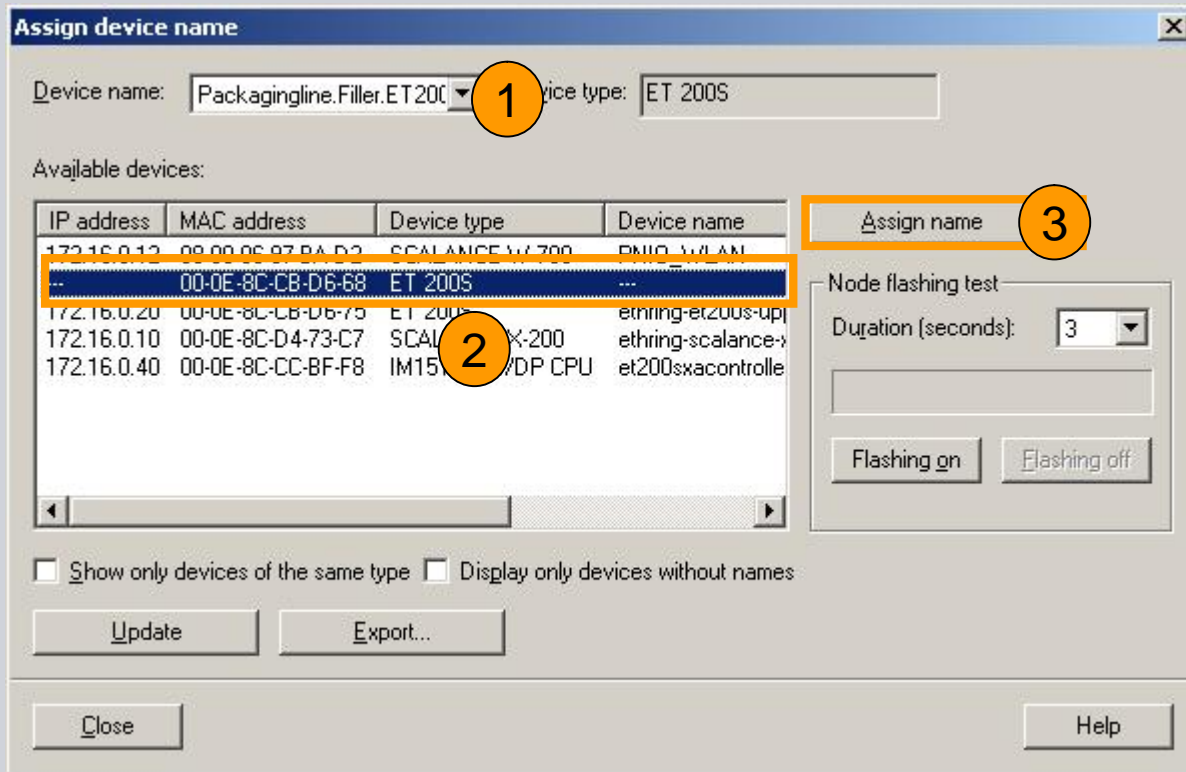


Exercise 1: PROFINET



1. Select IO-System or IO-Device
2. Call "Assign Device Name" Dialog

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

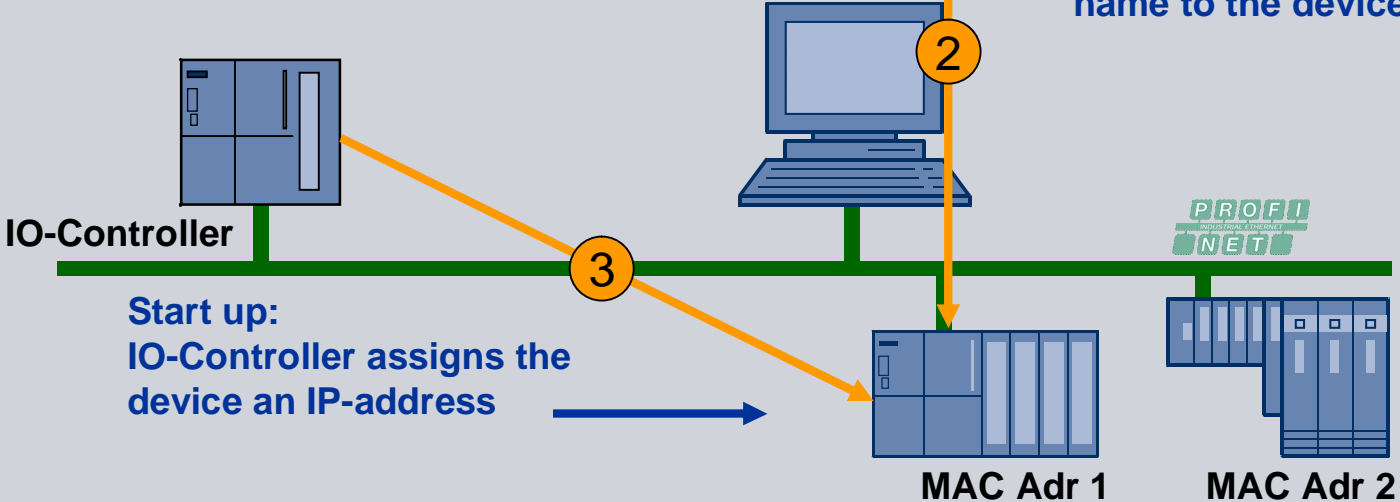
Exercise 1: PROFINET

Offline configuration

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

IP address	MAC address	Device type	Device name
172.16.0.12	08-00-06-97-BA-D2	SCALANCE W-700	PNIQ_WLAN
...	00-0E-8C-CB-D6-68	ET 200S	...
172.16.0.20	00-0E-8C-CB-D6-75	ET 200S	ething-et200s-upl
172.16.0.10	00-0E-8C-D4-73-C7	SCALANCE X-200	ething-scalance->
172.16.0.40	00-0E-8C-CC-8F-F8	IM151-8 PN/DP CPU	et200sxacontrolle

Online:
Write the device name to the device



Exercise 1: PROFINET

The image shows two overlapping screenshots of the SIMATIC Manager software. The top screenshot displays the 'Standard Library' window with a tree view on the left and a table of objects on the right. The table lists various organization blocks (OB) with their symbolic names and the language they were created in. An orange arrow points from the 'OB82' row in the table to the 'OB1' row in the table of the project window below. A yellow callout box with the text 'Copy OB82, OB83, OB86' is positioned over the arrow. The bottom screenshot shows the 'PROFINET-Rockbox' project window with a tree view on the left and a table of objects on the right. A yellow callout box with the text 'Download' is positioned over the 'Download' icon in the toolbar. The table in the bottom screenshot shows the copied blocks: OB82 (I/O_FLT1), OB83 (I/O_FLT2), and OB86 (RACK_FLT).

Object name	Symbolic name	Created in language
OB72	...	STL
OB73	...	STL
OB80	...	STL
OB81	...	STL
OB82	I/O_FLT1	STL
OB83	I/O_FLT2	STL
OB84	CPU_FLT	STL
OB85	OBNL_FLT	STL
OB86	RACK_FLT	STL
OB87	COMM_FLT	STL
OB88	BREAKUP ERROR	STL
OB89	BACKGROUND	STL
OB100	COMPLETE RESTART	STL

Object name	Symbolic name
OB1	MAIN
OB82	I/O_FLT1
OB83	I/O_FLT2
OB86	RACK_FLT

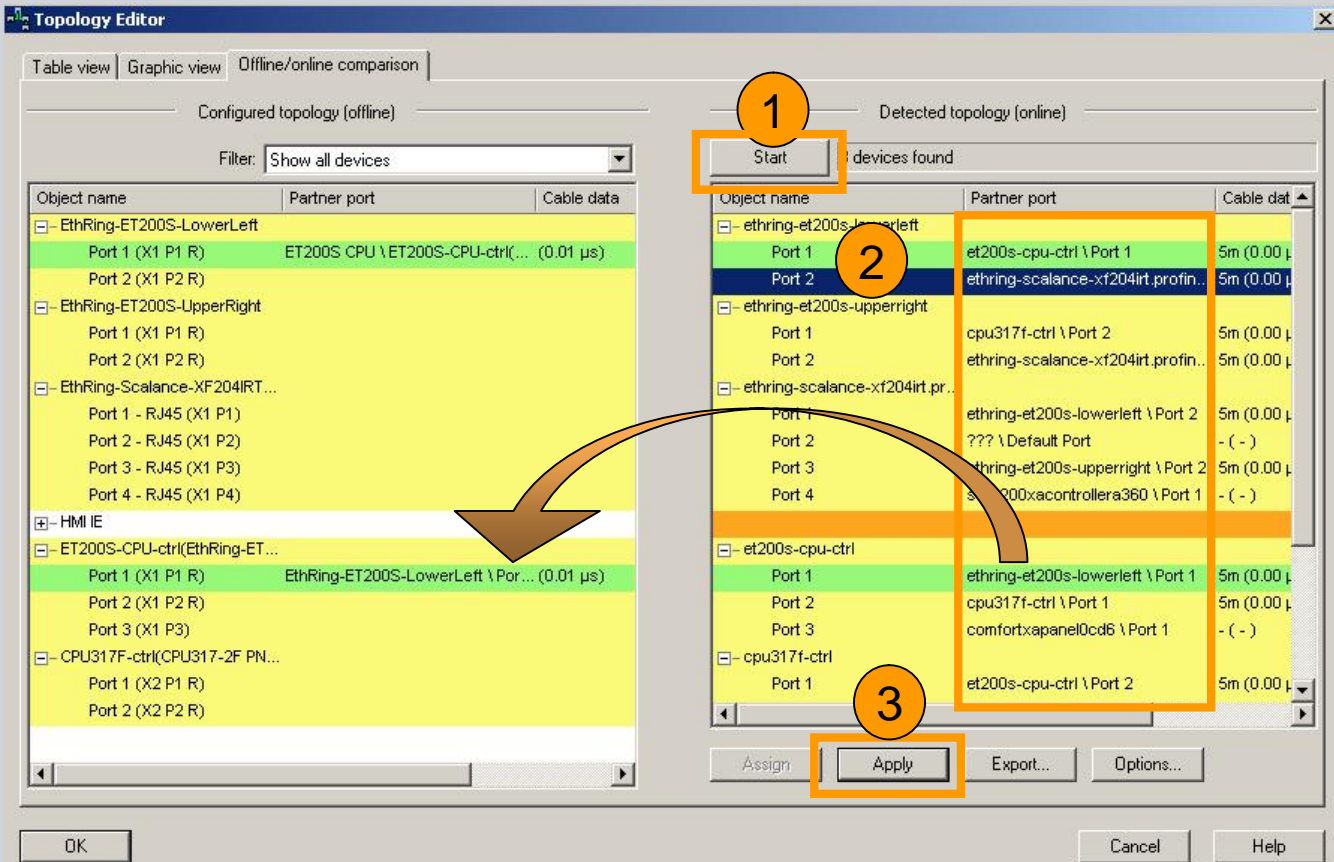
Exercise 1: Topology

The screenshot shows the Siemens HW Config interface. The main window displays a rack configuration for a CPU317F PN/DP. A right-click context menu is open over the 'PROFINET: PROFINET-IO-System (100)' component. The menu item 'PROFINET IO Topology...' is highlighted with a red circle labeled '1'. Below this, the 'Topology Editor' window is open, showing an 'Interconnection table' with a filter set to 'Show all ports'. The table lists connections between 'EthRing-ET200S-LowerLeft' and 'EthRing-ET200S-UpperRight' ports. A red circle labeled '2' is placed over the table. At the bottom, a legend shows icons for 'ET200S CPU', 'CPU317F PN/DP', 'EthRing-ET200S-UpperRight', 'EthRing-ET200S-LowerLeft', and 'EthRing-Scalance-X F204IRT.PROFIN...'.

Port	Partner port	Cable len	Signal del	Comment
EthRing-ET200S-LowerLeft				
Port 1 (X1 P1 R)				
Port 2 (X1 P2 R)				
EthRing-ET200S-UpperRight				
Port 1 (X1 P1 R)				
Port 2 (X1 P2 R)				

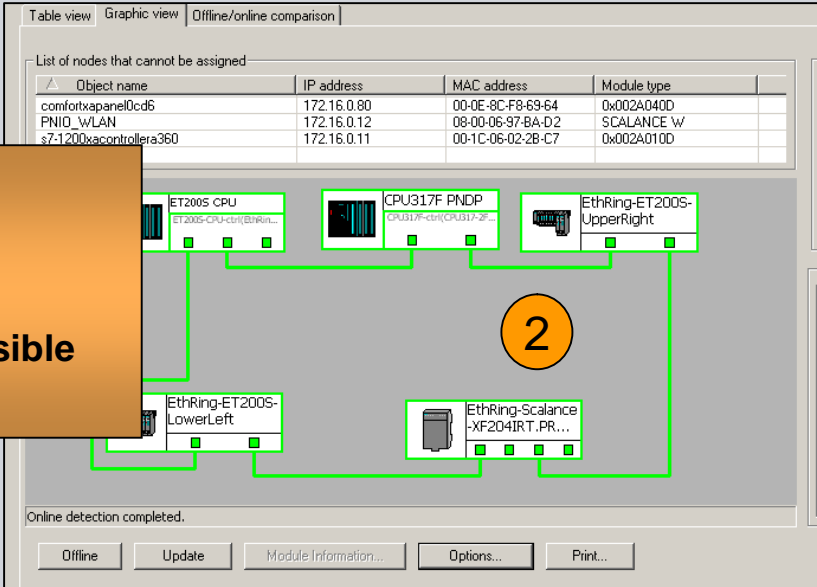
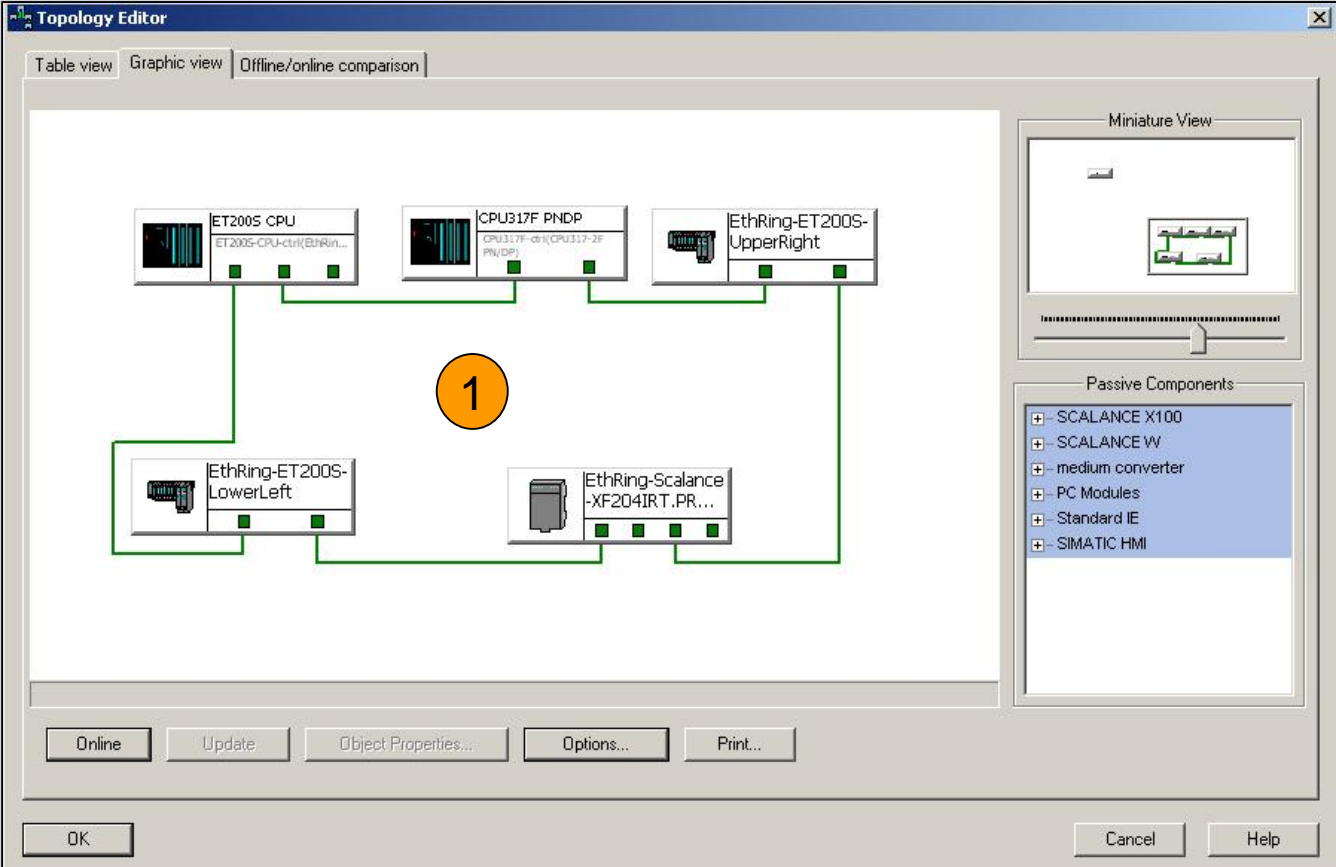
1. Right Mouse click on the PROFINET IO System
2. Call up Topology Editor

Exercise 1: Topology



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

Exercise 1: Topology



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



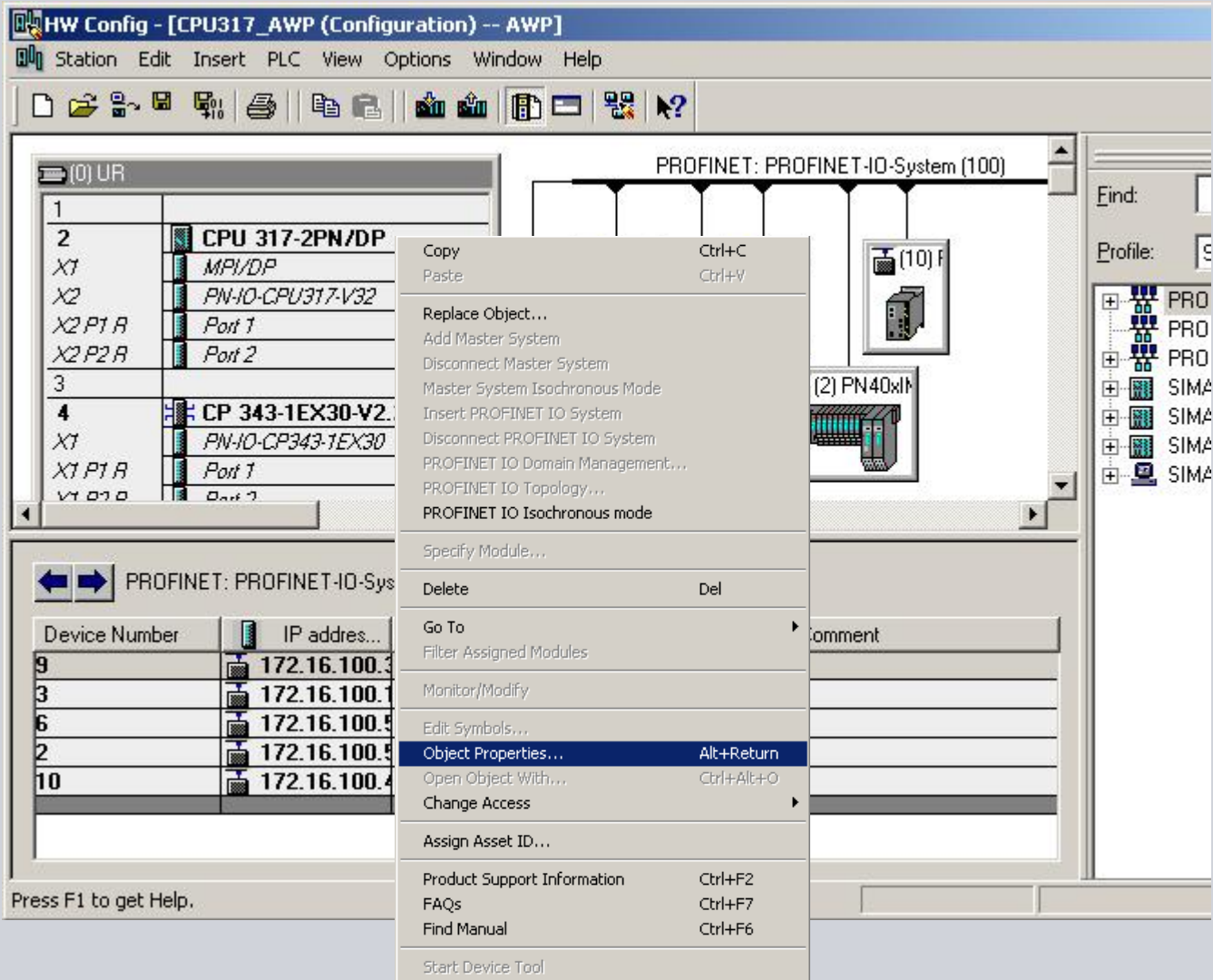
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Exercise

Exercise 2

Webinterface

Exercise 2: Web function



1. Call up Object Properties of the S7-PLC

Exercise 2: Web function

1. Activate Web interface
2. Edit User Management

Properties - CPU 317-2PN/DP - (R0/S2)

Cycle/Clock Memory | Retentive Memory | Interrupts | Time-of-Day Interrupts
General | Startup | Synchronous Communication
Diagnostics/Clock | Protection | Communication

Enable Web server on this module Allow access only via HTTP

Languages to be Loaded on the CPU
Select up to 2 languages:
 German (Germany)
 English (United States)
 French (France)
 Spanish (Traditional Sort)
 Italian (Italy)

Automatic Update
 Activate Update interval: 3 s

Display Classes of the Messages
 00 04 08 12 16
 01 05 09 13
 02 06 10 14
 03 07 11 15

User list:

Benutzer	Rechte

Add... Edit... Delete

OK

Edit User Entry and Password

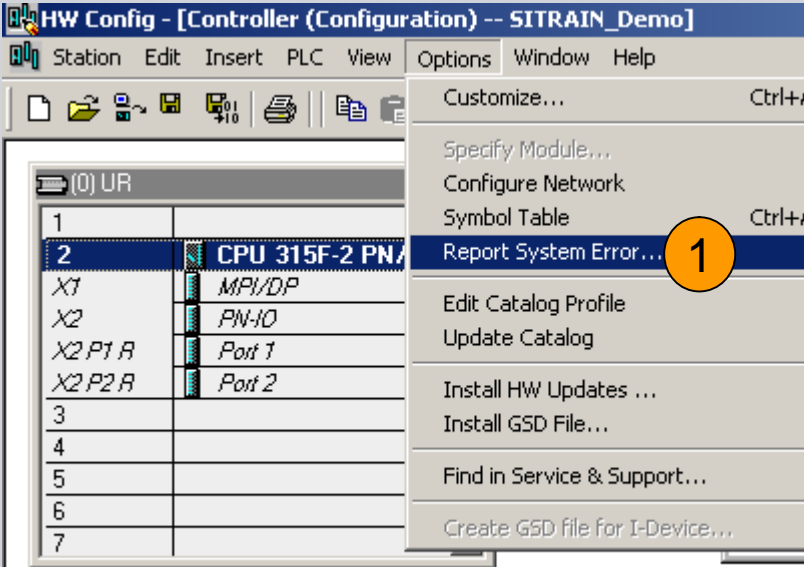
User Name: Operator

The user can...
 Query diagnostics
 Read variable status
 Read variable table
 Call user-defined pages Write to user-defined pages

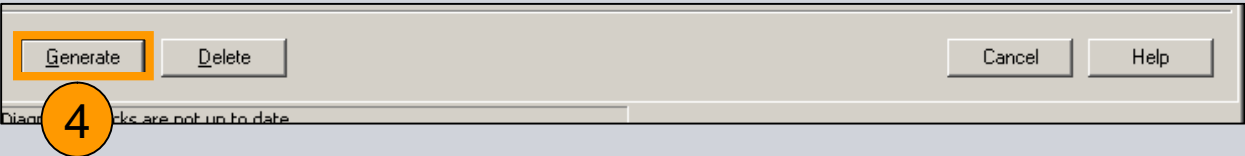
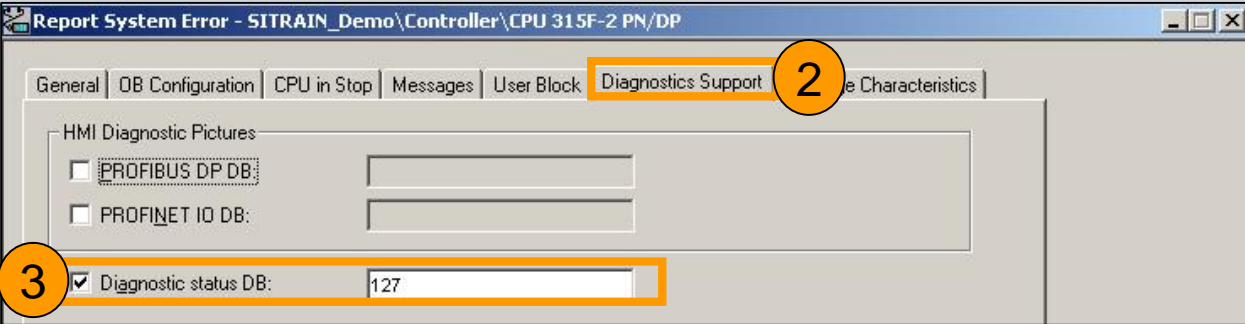
Edit password
Password:
Confirm password:

OK Cancel Help

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



Exercise 2: Web function

SIEMENS CPU319-3/CPU 319-3

SIMATIC CONTROLLER

- Start page
- Identification
- Diagnostic Buffer
- Module information**
- Messages
- PROFINET
- Topology
- Tag status
- Variable tables
- Introduction

Report System Error - SITRAIN_Demo\Controller\CPU 315F-2 PN/DP

General | OB Configuration | CPU in Stop | Messages | User Block | Diagnostics Support

HMI Diagnostic Pictures

- PROFIBUS DP DB: []
- PROFIBUS IO DB: []
- Diagnostic status DB: [127]

Error	Name
✓	Rack300_3_re
✓	PROFIBUS_319_DP-PA: DP-Mastersystem_X1(1)
✓	PROFIBUS-PA_1(1): PA-Mastersystem (5980)
✓	PROFIBUS_CPU319: DP-Mastersystem_X2 (2)
✓	Ethernet_1(1): PROFINET-IO-System_X3 (100)

Module information

Filter

CPU319-3 - Ethernet_1(1): PROFINET-IO-System_X3 (100)

Symbol	Name	Order number	IP Address	Comment
✓	Buero-TIA-Rack-X208	6GK5 208-0BA00-2AA3	172.16.15.41	
✓	TIA-IM151-3-2	6ES7 151-3BA20-0AB0	172.16.15.42	Kommentar - IM151-3

Module information

Filter

CPU319-3 - Ethernet_1(1): PROFINET-IO-System_X3 (100) - TIA-IM151-3-2

Slot	Symbol	Name	Order number	I Address	O Address	Comment
0	✓	TIA-IM151-3-2	6ES7 151-3BA20-0AB0			
1	✓	PM-E DC24V	6ES7 138-4CA00-0AA0	8171		
2	✗	2DO DC24V/0,5A HF	6ES7 132-4BB00-0AB0		33.0	
3	✓	4DI DC24V HF	6ES7 131-4BD00-0AB0	33.0		

Status Identification

PN device 2 on PN system 100 Slot: 2: Wire break on channel 1 Name: TIA-IM151-3-2 Module: 2DO DC24V/0,5A HF I/O address: 033

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

Exercise 2: Web function

1. Right Mouse click on Variable Table

2. Call Object Properties "General Part 2" and Check Web Server

Properties - Variable Table

General - Part 1 | General - Part 2 | Attributes

Name (Header): Version (Header): 0.1

Family: Author:

Lengths

Local Data:

MC7:

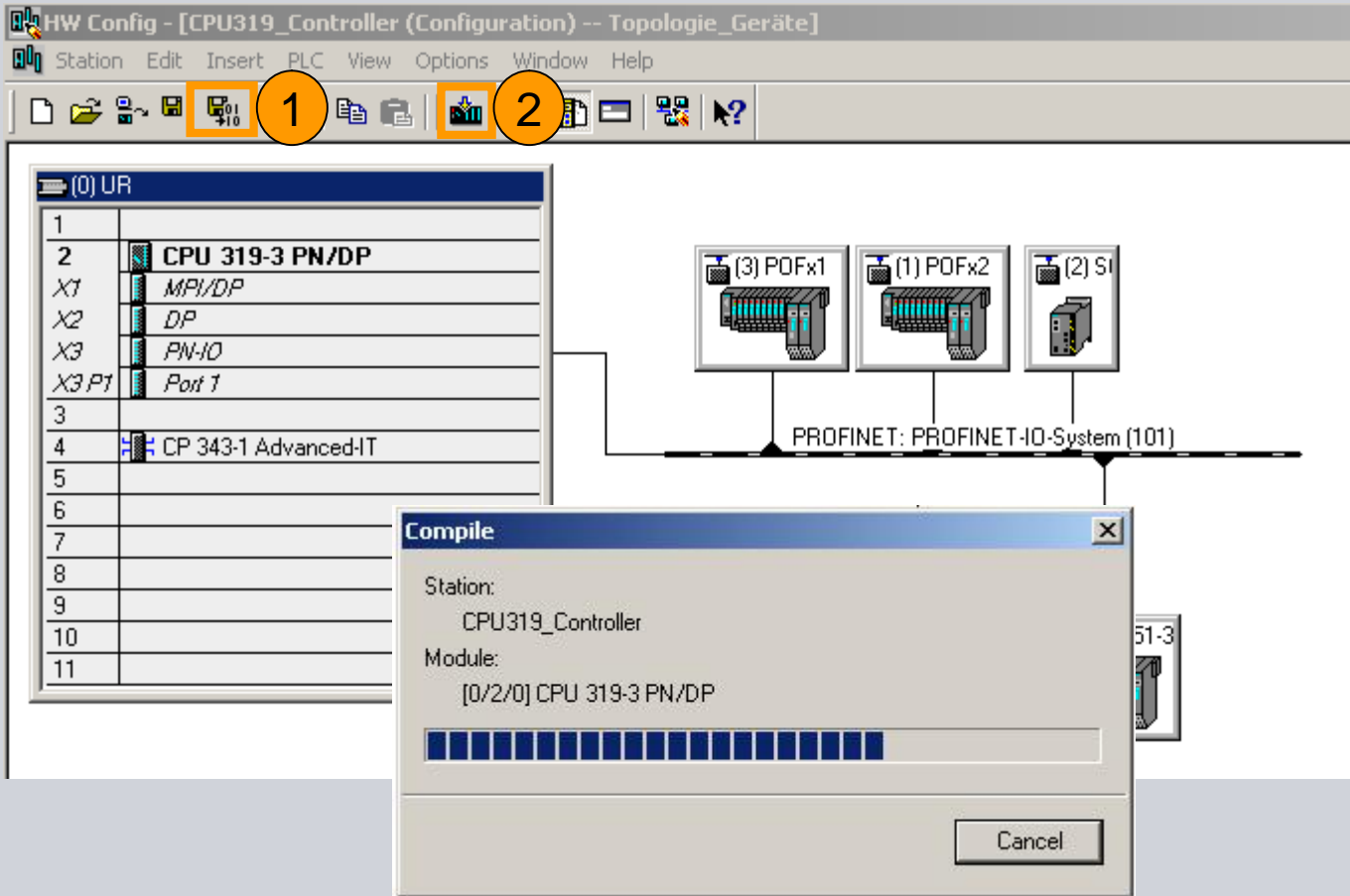
Load Memory Requirement:

Work Memory Requirement:

Web server

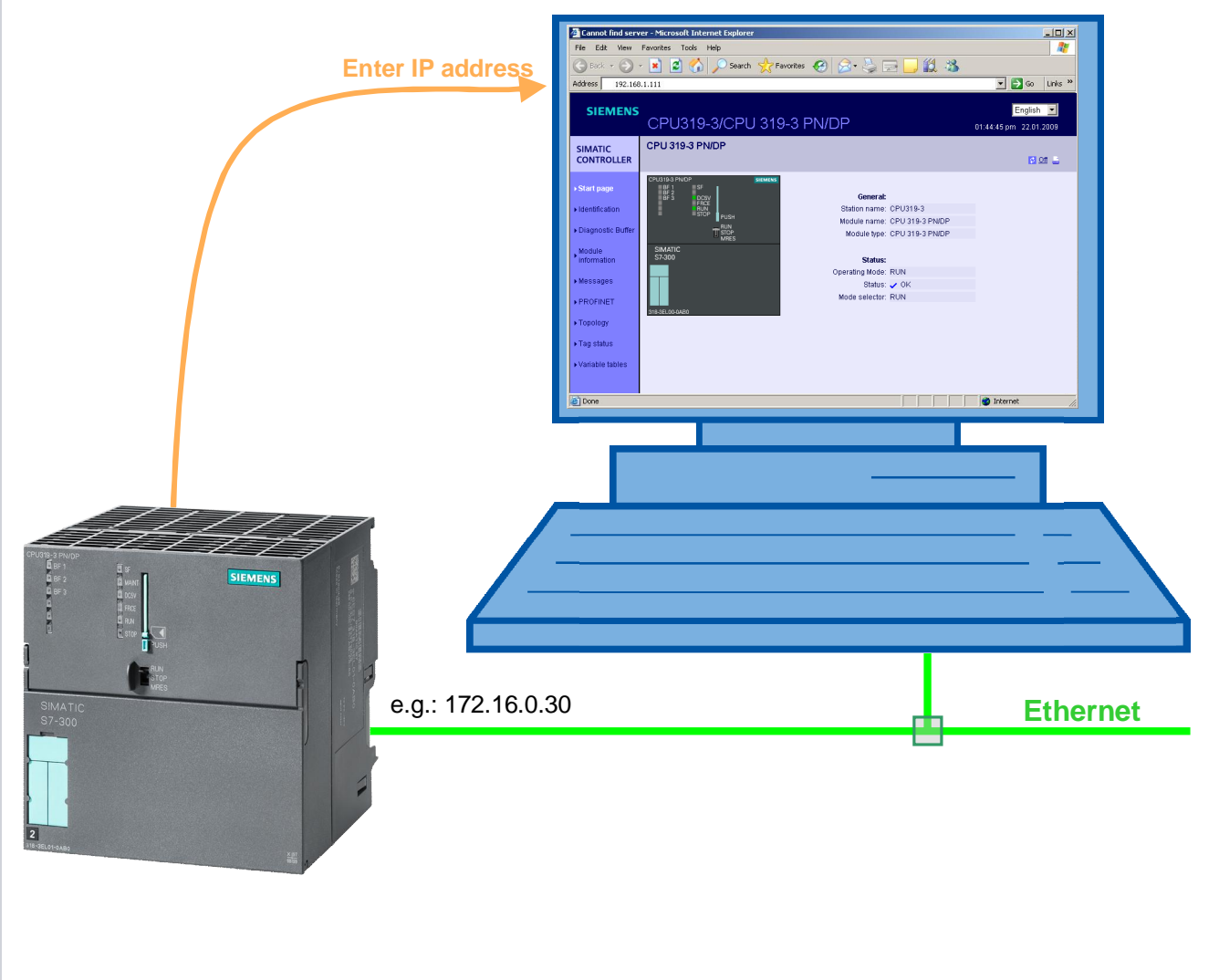
OK Cancel Help

Exercise 2: Web function



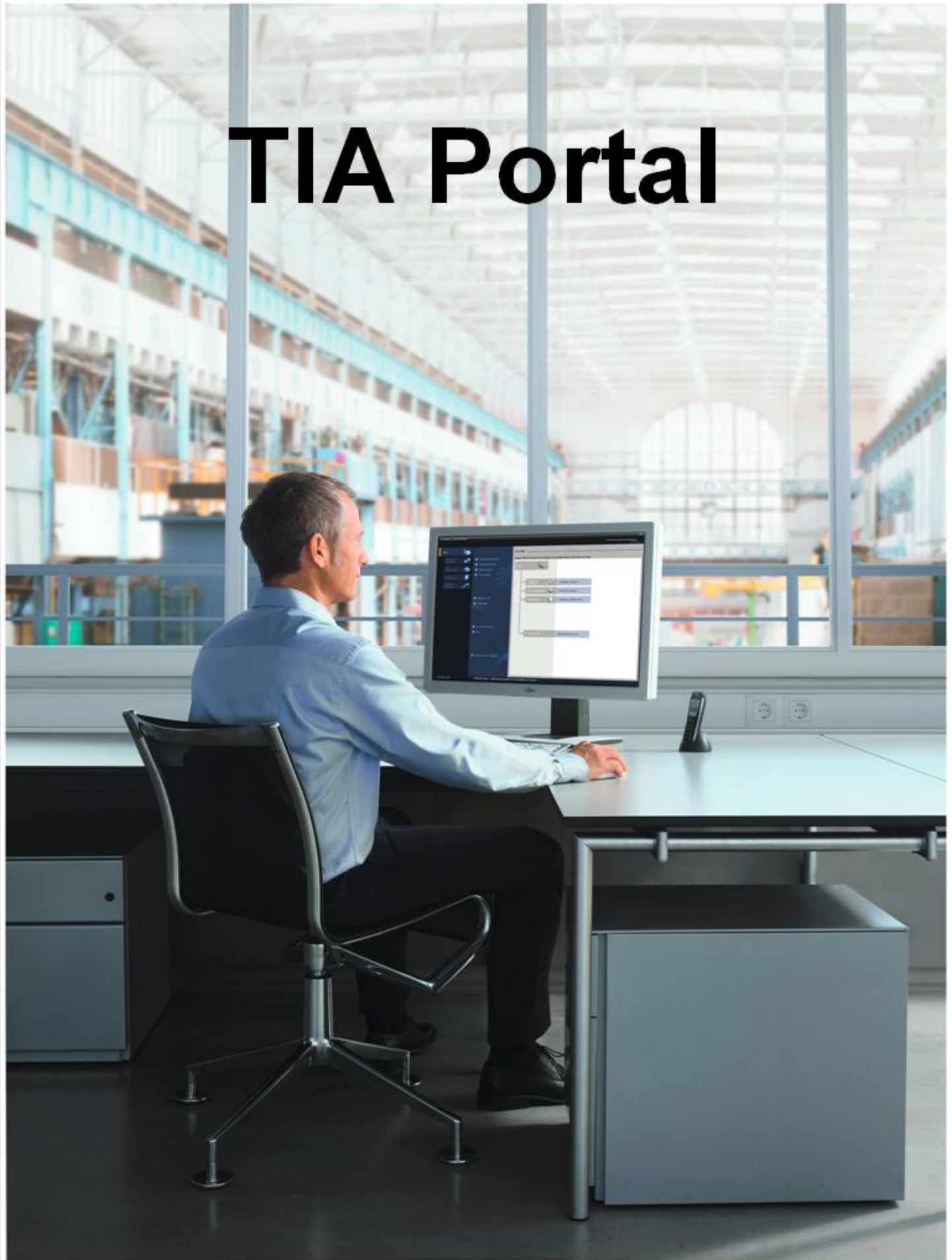
1. „Save&Compile“ of Hardware-Configuration is necessary.
2. Download of Hardware Config

Exercise 2: Web function



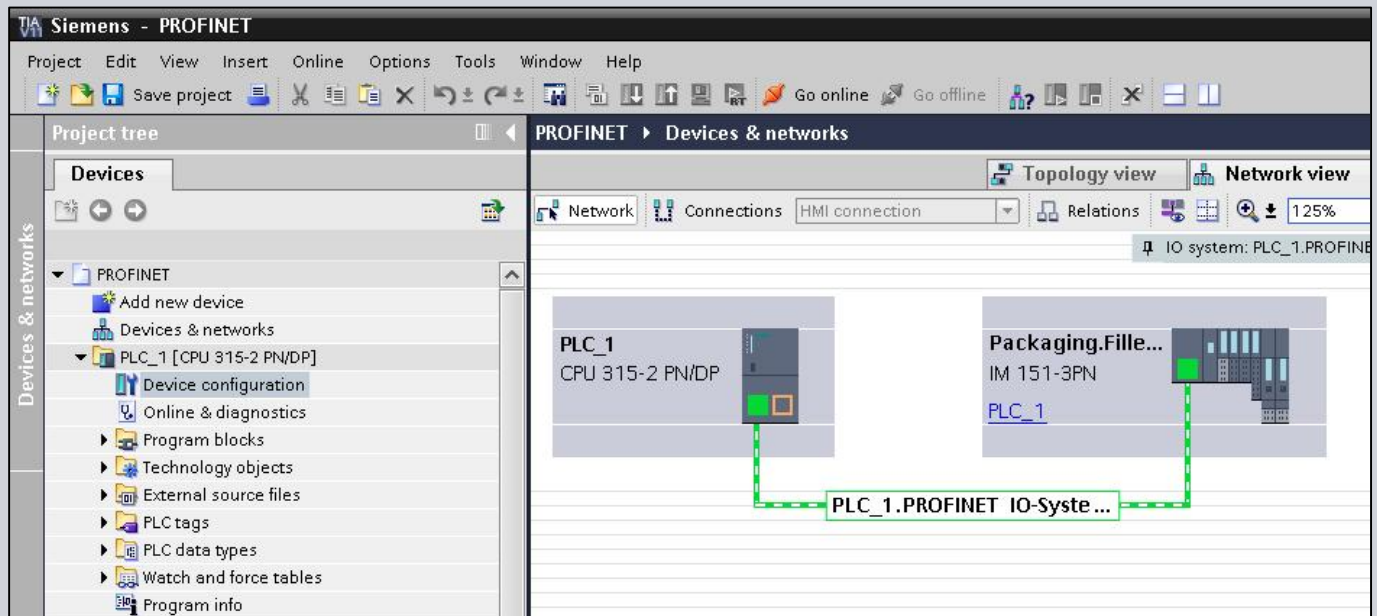
Start Web Browser and Test functionality

TIA Portal

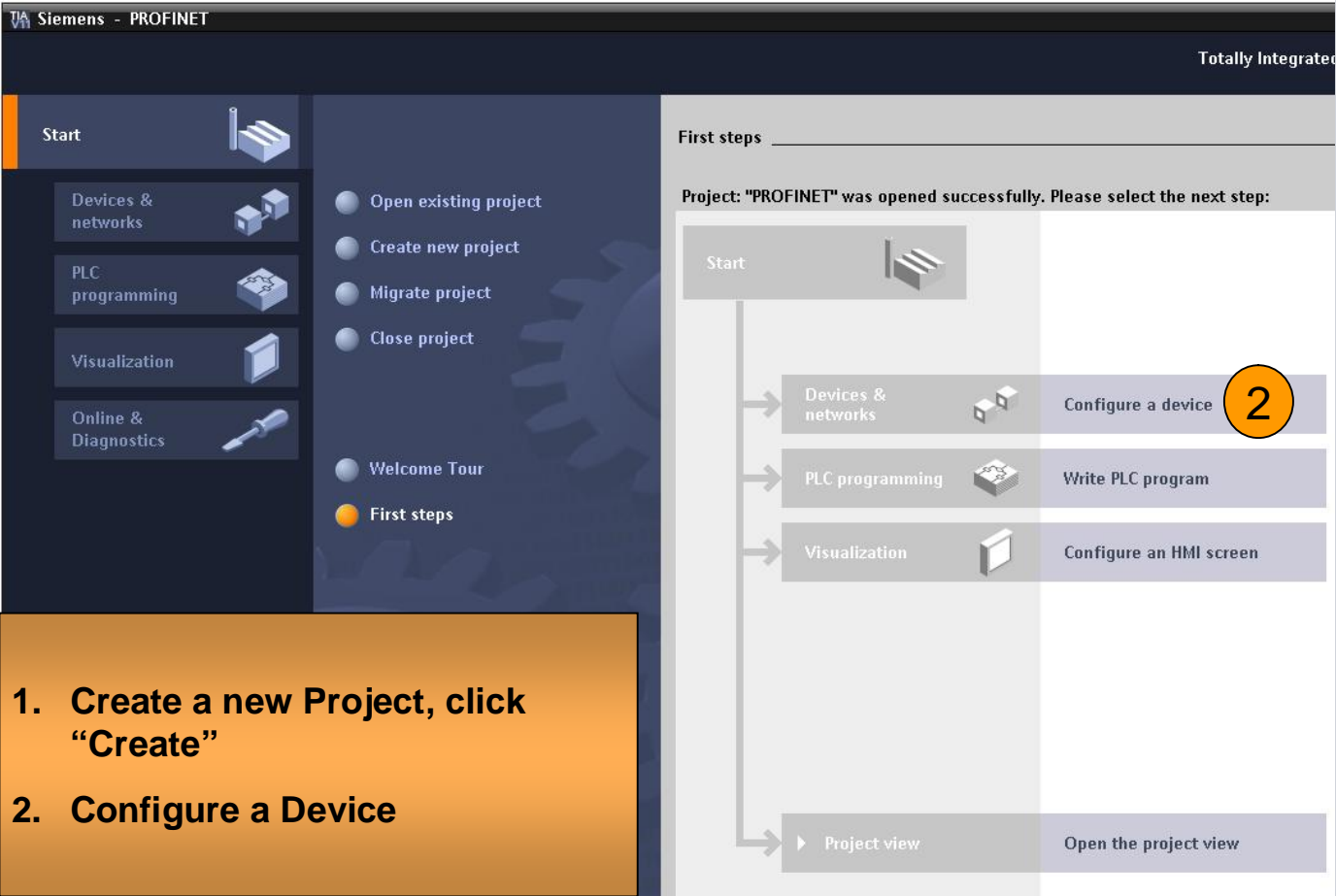
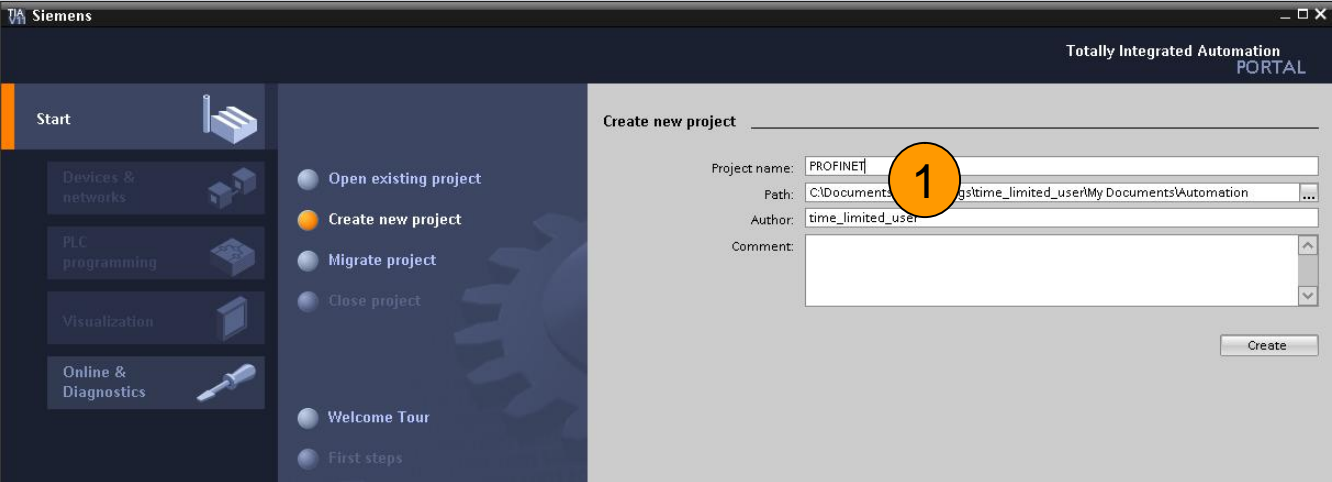


Exercise 2: TIA Portal

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

1. Add a new Device
2. Use a CPU
3. Take the CPU which is at your Training Kit and "Add it"

The screenshot shows the Siemens TIA Portal interface. On the left, a sidebar contains navigation buttons: 'Start', 'Devices & networks', 'PLC programming', 'Visualization', and 'Online & Diagnostics'. The 'Add new device' dialog is open, showing a tree view of PLC components. The 'CPU 315-2 PN/DP' is selected, and its details are shown on the right, including the order number '6ES7 315-2EH14-0AB0' and version 'V3.2'. An 'Add' button is highlighted at the bottom right.

Exercise 2: TIA Portal

1. Select Ethernet Port

2. Go to Ethernet addresses

3. Add New Subnet

4. Define IP-Address

ROFINET interface_1 [PN-IO]

General

Ethernet addresses

Ethernet addresses

Interface networked with

Subnet: PN/IE_1

Add new subnet

IP protocol

Set IP address in the project

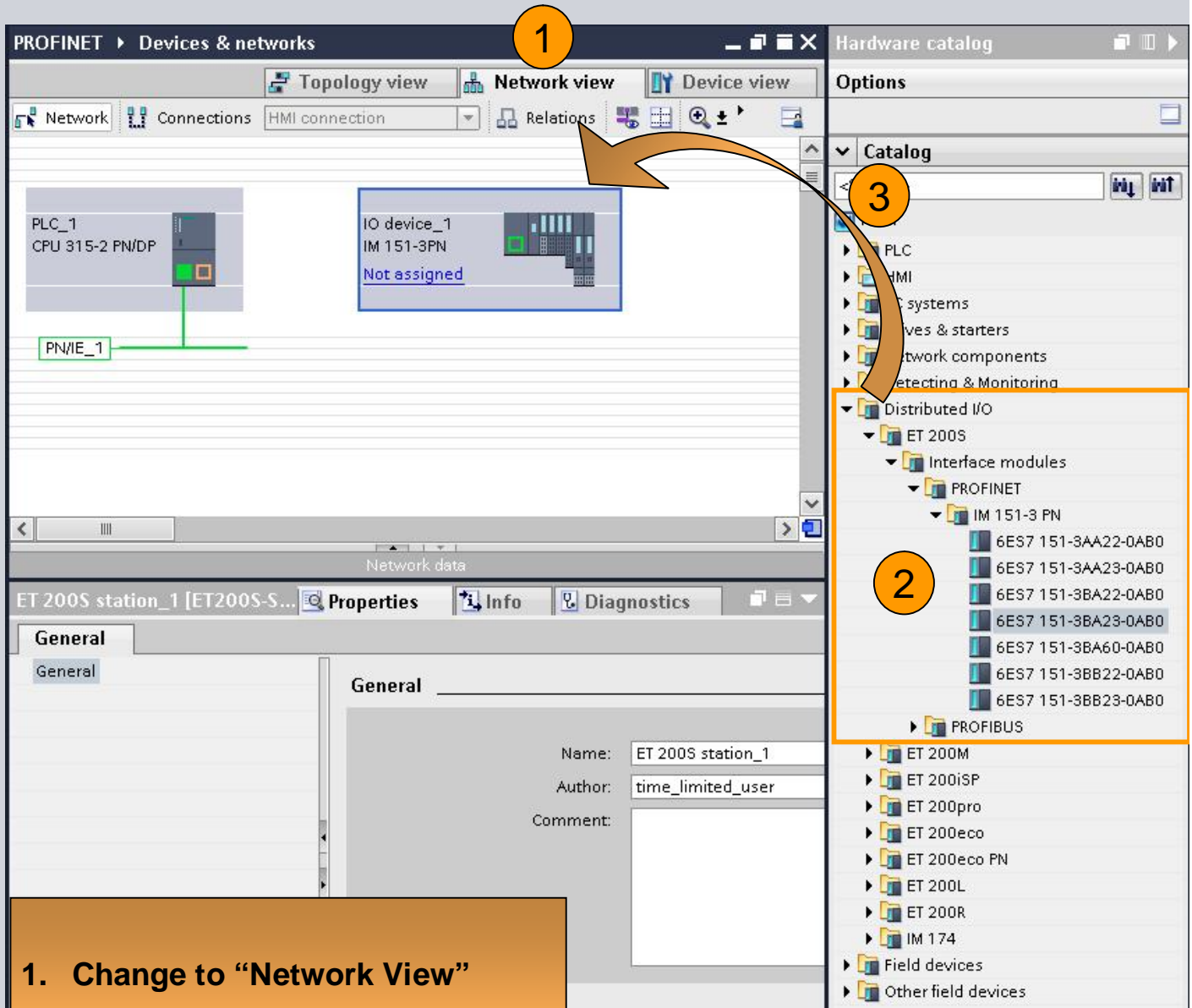
IP address: 192 . 168 . 0 . 1

Subnet mask: 255 . 255 . 255 . 0

Use IP router

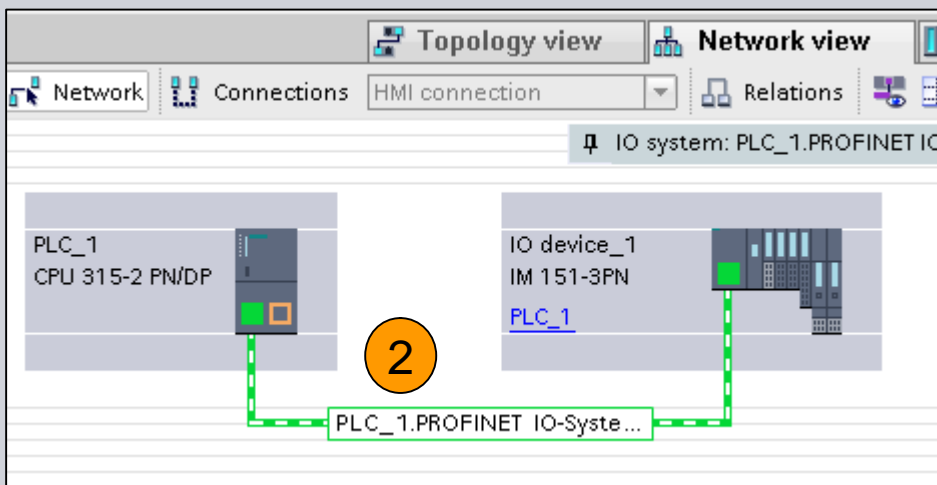
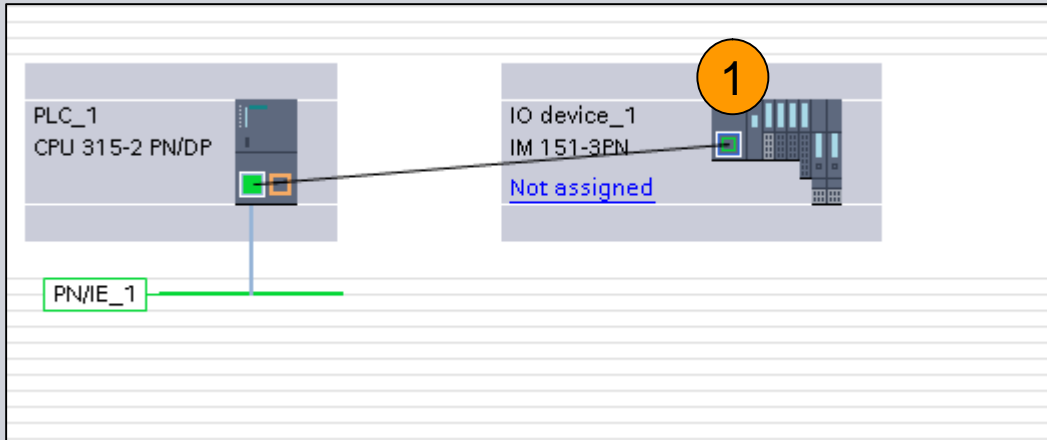
Router address: 0 . 0 . 0 . 0

Exercise 2: TIA Portal



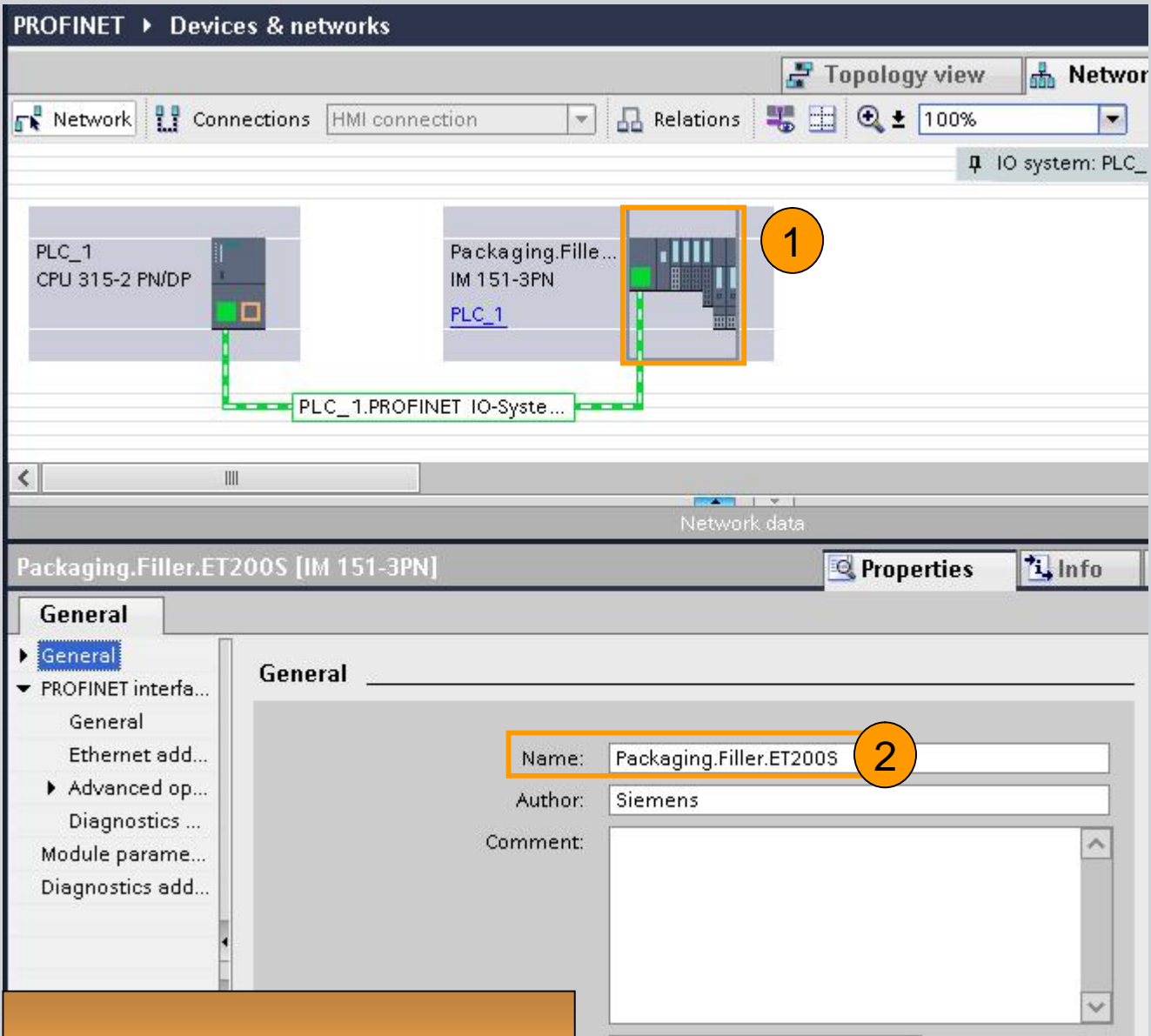
1. Change to “Network View”
2. Select your Remote IO from the Training Kit
3. Drag&Drop it into your working area

Exercise 2: TIA Portal



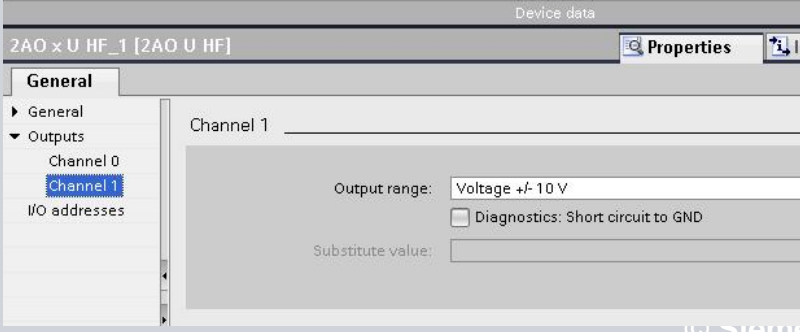
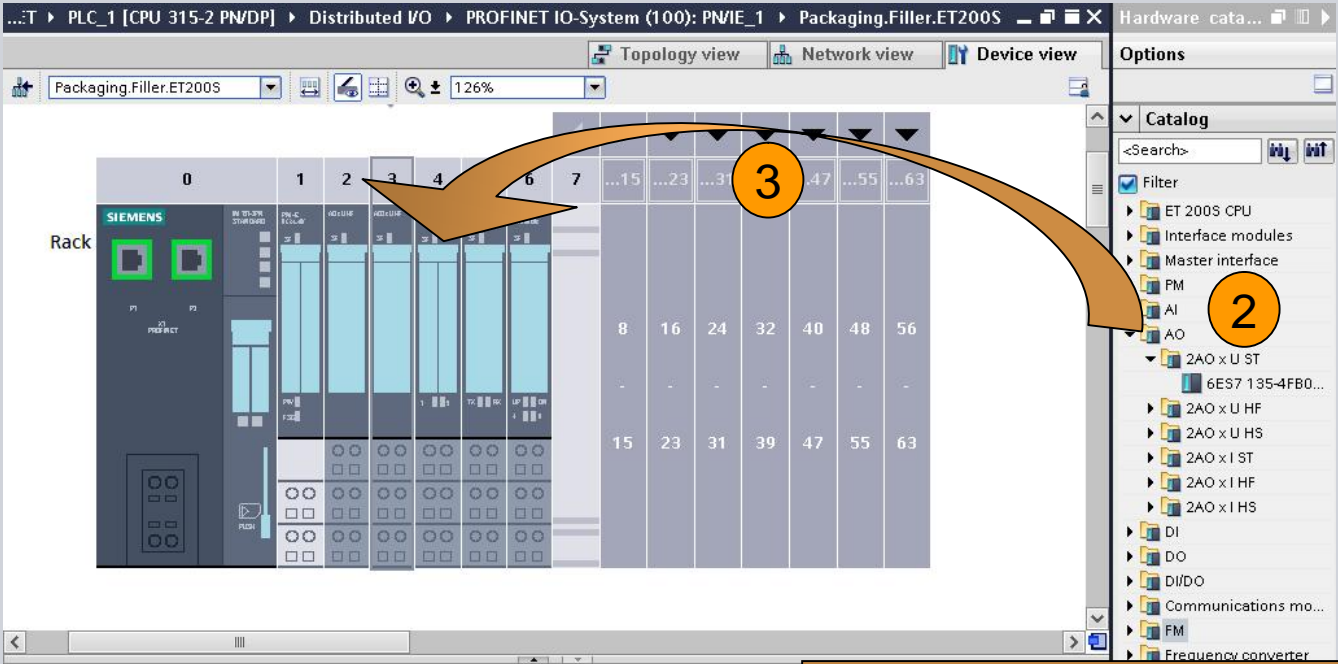
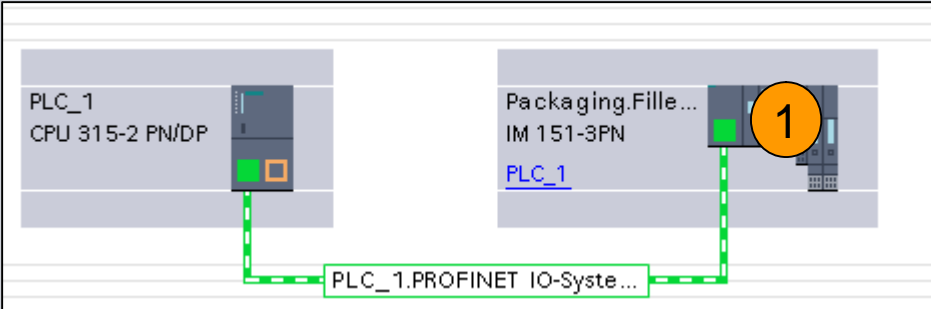
1. Drag Interface of the remote IO
2. Drop it to the Controllers Interface and release mouse
3. Repeat this step for all IO Devices

Exercise 2: TIA Portal



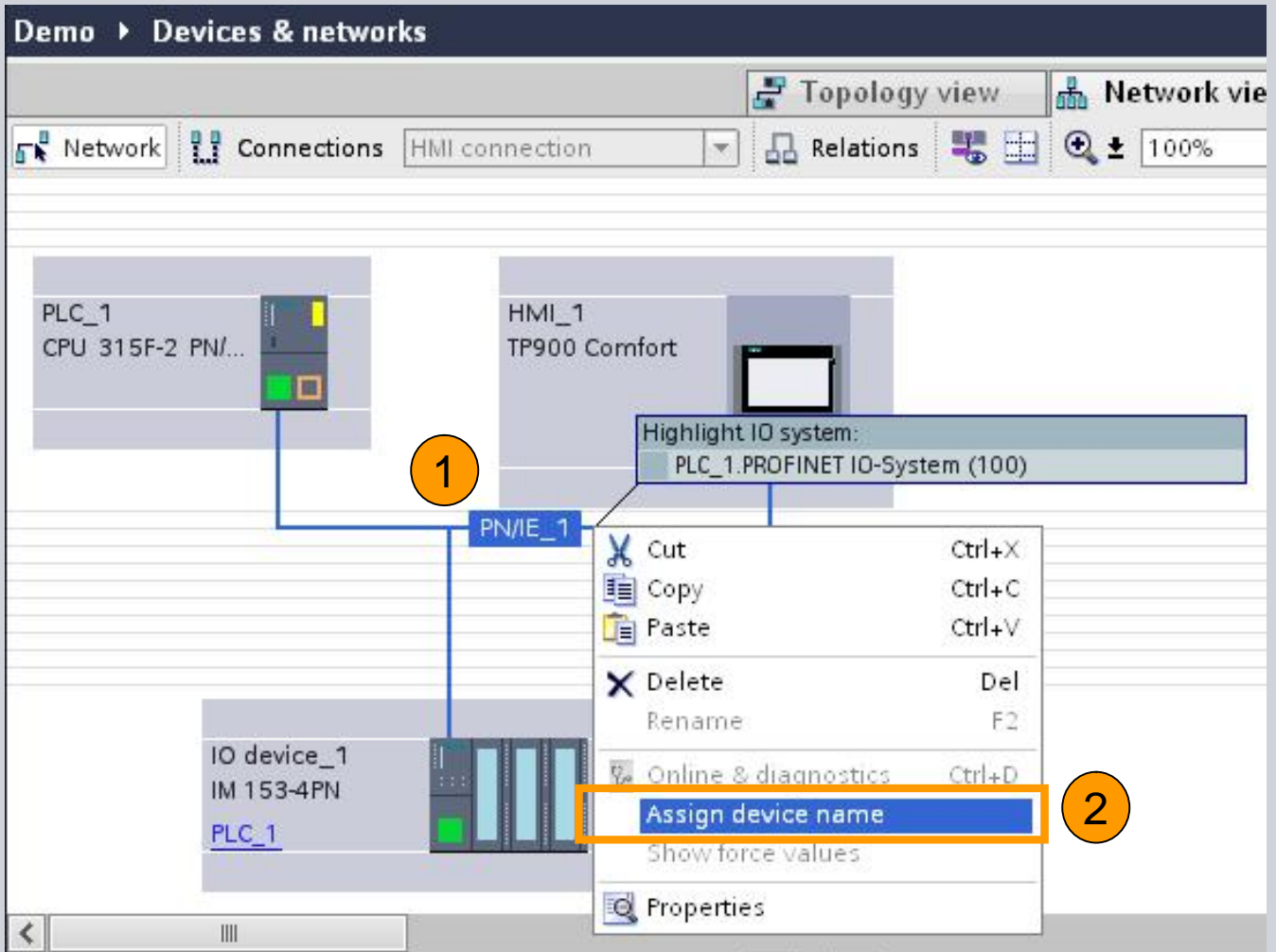
1. Select Device
2. Define Device Name

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

Exercise 2: TIA Portal



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

Exercise 2: TIA Portal

Assign PROFINET device name.

1. PROFINET device name: packaging.filler.et200s
Type: IM 151-3 PN

2. Type of the PG/PC interface: PN/IE
PG/PC interface: VMware Accelerated AMD

Only show devices of the same type
 Only show devices with bad parameter settings
 Only show devices without names

Accessible devices in the network:

IP address	MAC address	Type	Name	Status
172.16.0.12	08-00-06-97-BA-D2	SCALANCE W-700	PNIO_WLAN	OK
172.16.0.20	00-0E-8C-CB-D6-75	IM151-3	ethring-et200s-upp...	OK
172.16.0.30	00-0E-8C-CB-72-FF	S7-300	cpu317 controller	OK
172.16.0.40	00-0E-8C-CC-BE-E8	ET200S CPU	et200s controller	OK
172.16.0.50	00-0E-8C-CB-D6-68	IM151-3	ethring-et200s-low...	OK
172.16.0.60	00-0E-8C-F0-09-04	HW	control panel	OK

3. Assign name

4. Assign name

Close

1. Select Device Name
2. Select Online Interface
3. Select Device you want to address
4. "Assign Name"

Exercise 2: TIA Portal

1. Select CPU and Download
2. Select Network Type
3. Select "Show all devices"
4. Select correct CPU
5. Load configuration

Configured access nodes of "CPU317 Controller"

Device	Device type	Type	Address	Subnet
CPU317 Controller	CPU 317F-2 PN/DP	PN/IE	172.16.0.30	PROFINET
	CPU 317F-2 PN/DP	MPI	2	

Type of the PG/PC interface: **PN/IE**
PG/PC interface: **VMware Accelerated AMD**
Connection to subnet: **(local) PN/IE**
1st gateway:

Accessible devices in target subnet: Show all accessible devices

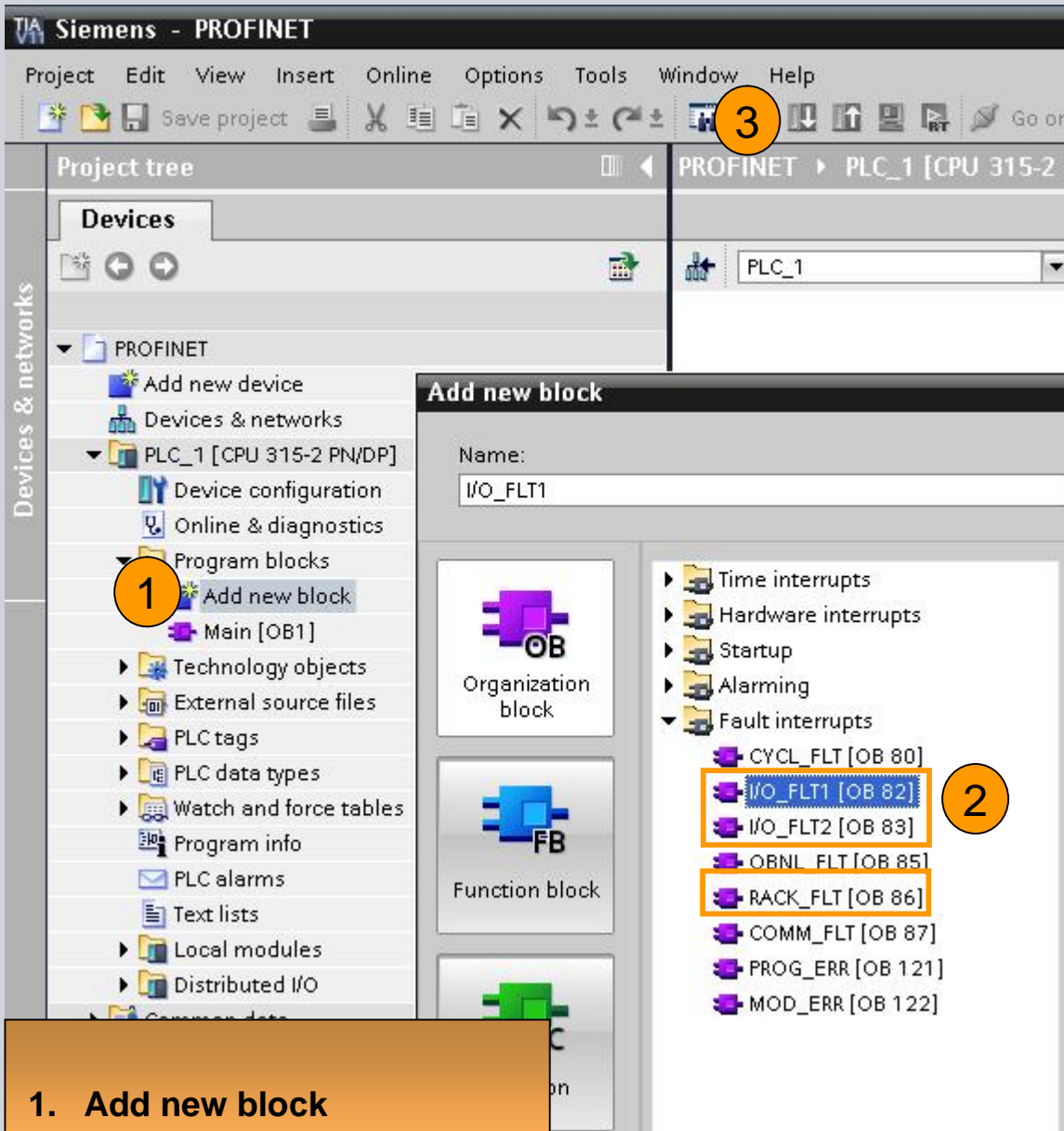
Device	Device type	Type	Address	Target device
ET200S Controller	IM 151-8 PN/DP C...	PN/IE	172.16.0.40	ET200S Controller
ethring-et200s-lowerle...	IM 151-3 PN	PN/IE	172.16.0.50	-
comfort panel	HMI	PN/IE	172.16.0.80	-
Accessible device	S7-300	ISO	00-0E-8C-CB-72-FF	-
-	-	PN/IE	Access address	-

Flash LED

Online status information:
⚠ Found accessible device ethring-et200s-uppright [172.16.0.20]
✅ Scanning ended.

5 **Load** **Cancel**

Exercise 2: TIA Portal



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

Exercise 2: TIA Portal

Network 1:

Comment

▼ "StartMotor"	%MO.0
"EStop"	%MO.1
"MotorConveyer"	%AO.0

1

1. Open OB 1 and write a little program
2. Test

Block interface

Block title: "Main Program Sweep (Cycle)"

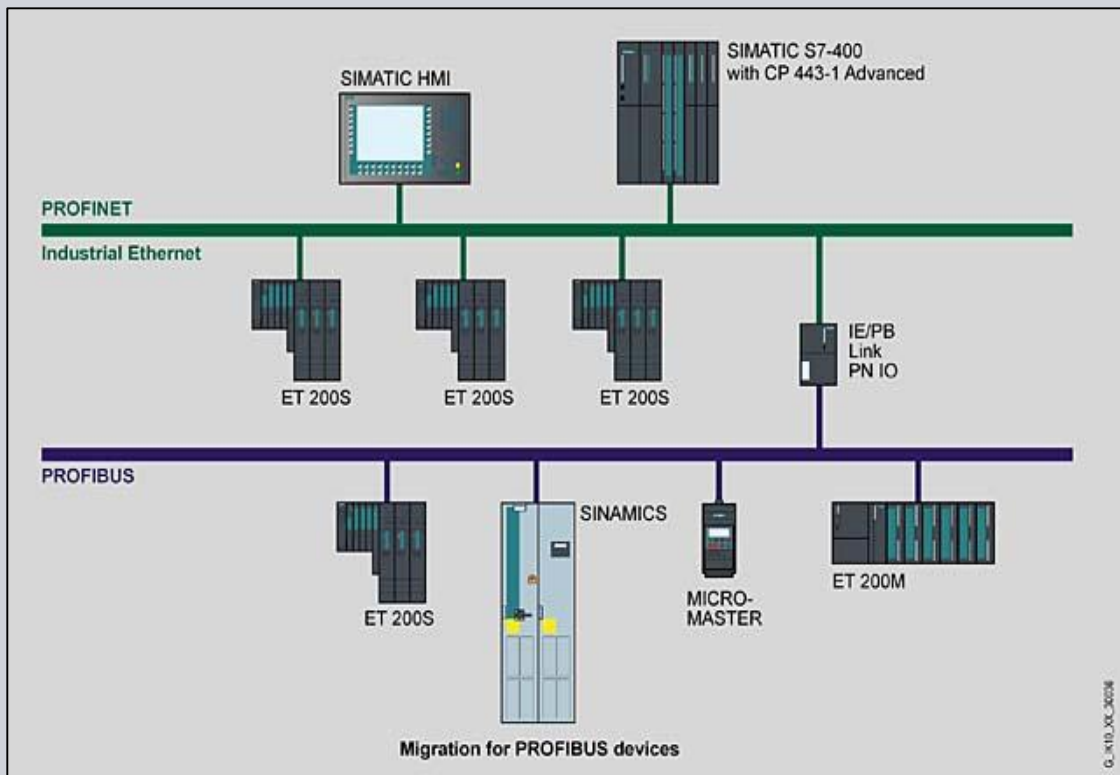
Comment

Network 1:

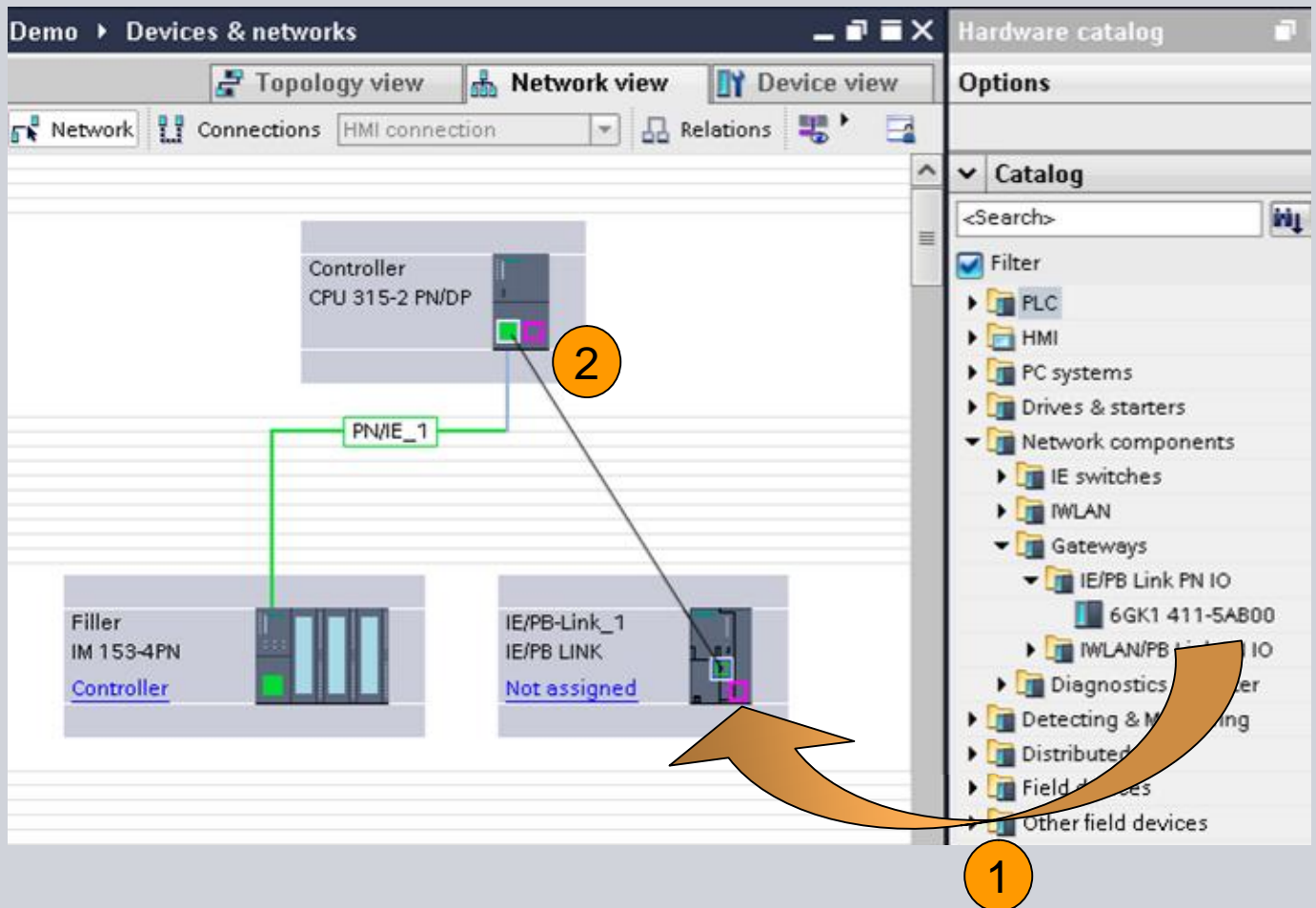
Comment

Exercise 3: Fieldbus Integration

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

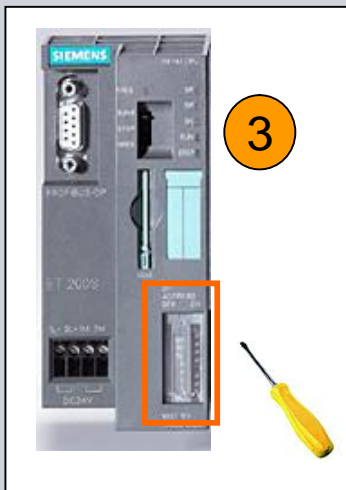
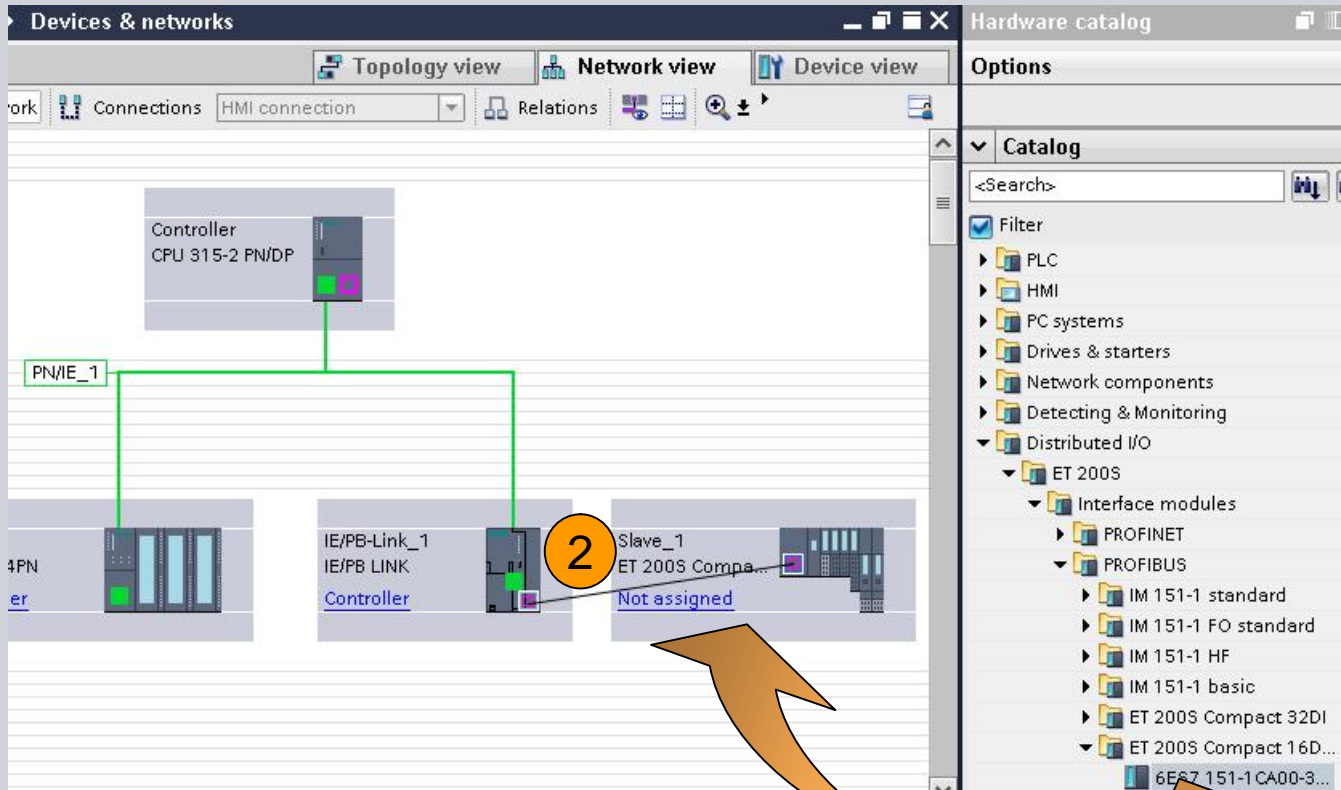


Exercise 3: Fieldbus Integration



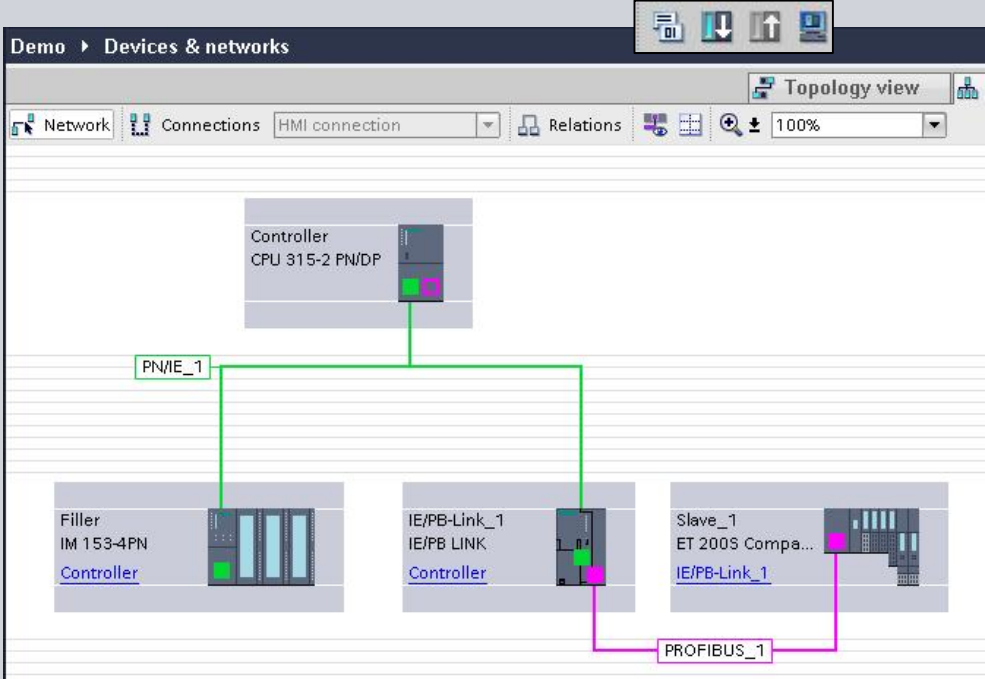
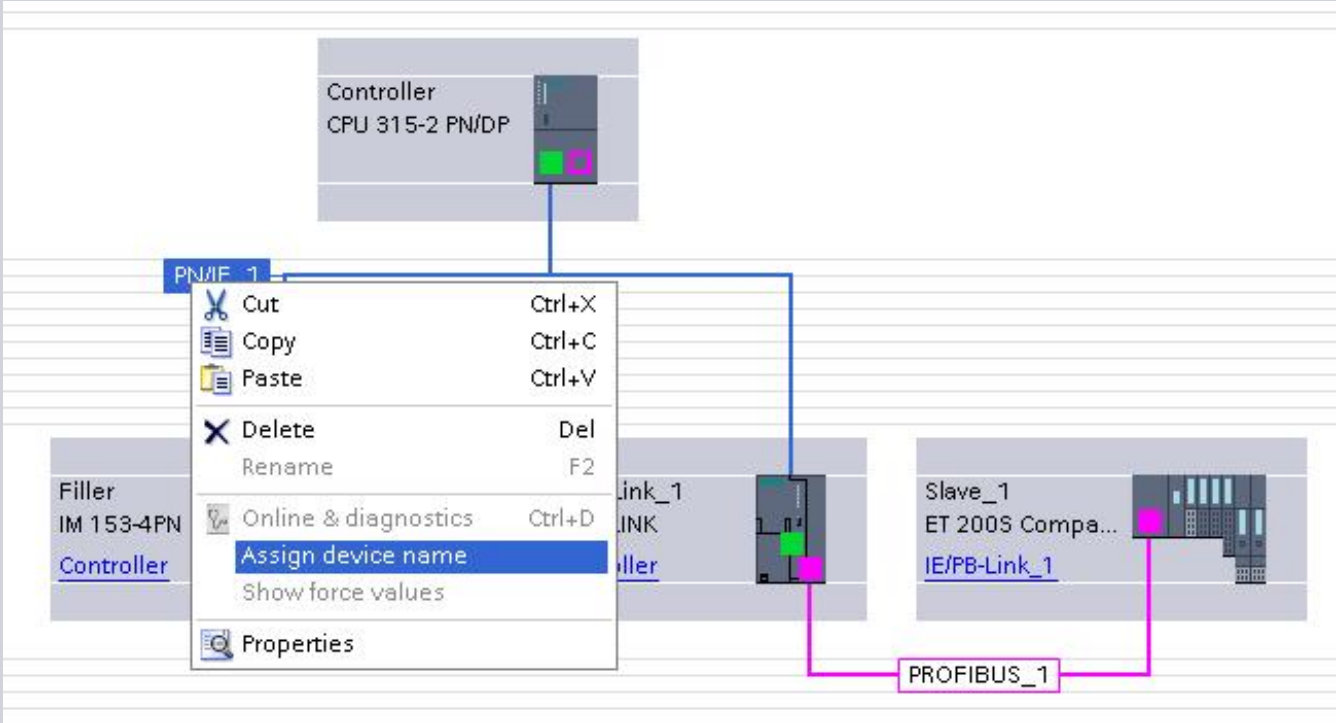
1. Select the Gateway you want to use
2. Drag and Drop it to your Network View
3. Connect the Ethernet Port to the IO-Controller

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**

Exercise 3: Fieldbus Integration



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

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

The screenshot shows the SIMATIC Manager interface for a CPU 319-3 PN/DP. The top navigation bar includes the SIMATIC CONTROLLER menu and a language dropdown set to English. The main area displays the 'General' information for the CPU, including station and module names.

A secondary window is open, showing the 'Diagnostic Buffer' for the same CPU. It contains a table of diagnostic entries:

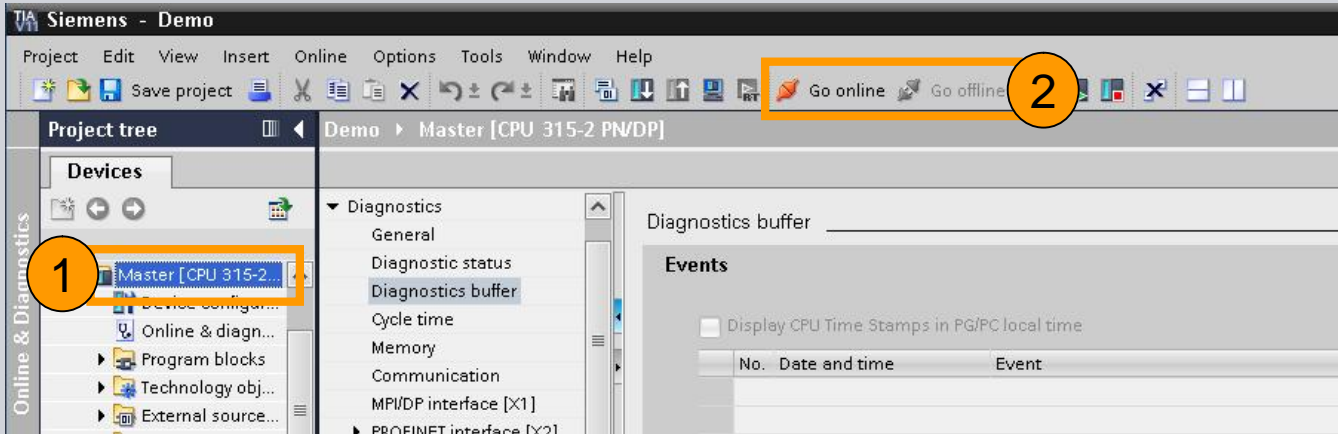
Number	Time	Date	Event
1	10:54:49:222 am	22.01.2009	Module problem or maintenance necessary
2	10:53:49:534 am	22.01.2009	Module problem or maintenance necessary
3	10:53:49:523 am	22.01.2009	Module problem or maintenance necessary
4	10:51:17:915 am	22.01.2009	Module OK
5	10:51:17:901 am	22.01.2009	Module problem or maintenance necessary
6	01:02:56:819 am	01.01.1994	Module problem or maintenance necessary
7	01:02:56:808 am	01.01.1994	Module problem or maintenance necessary
8	00:58:19:628 am	01.01.1994	Mode transition from STARTUP to RUN
9	00:58:19:626 am	01.01.1994	Request for manual warm restart
10	00:58:19:539 am	01.01.1994	Mode transition from STOP to STARTUP

Below the table, the 'Details: 1' section provides further information for the first event:

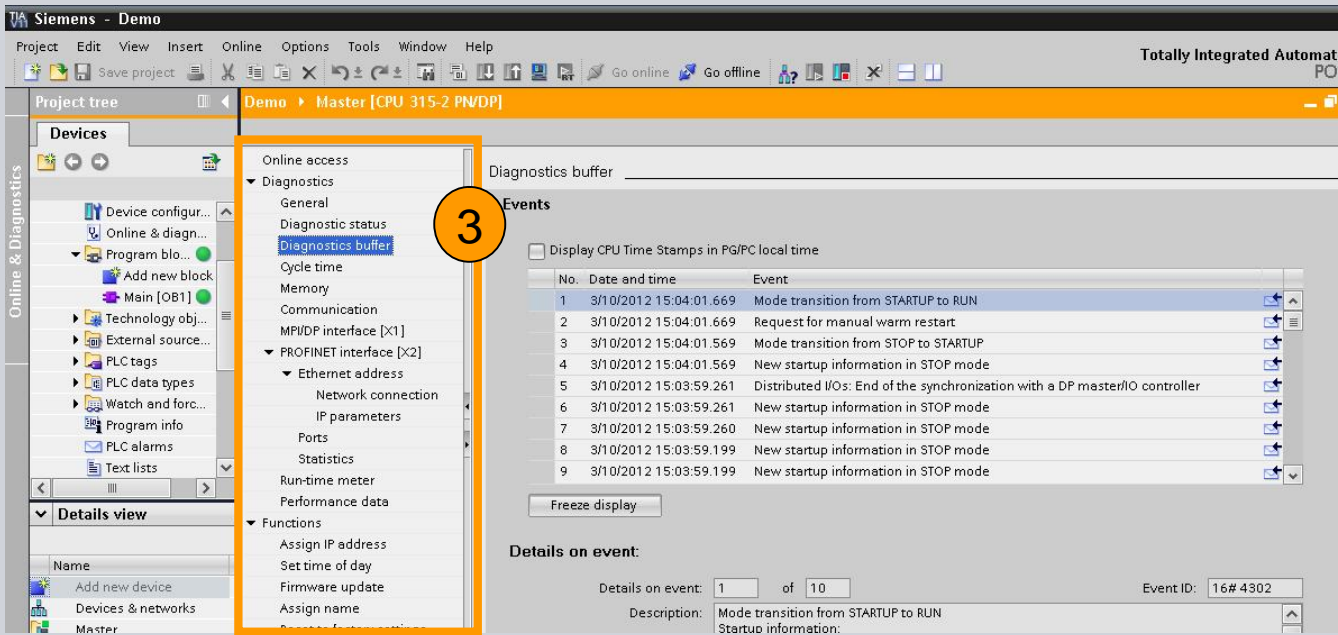
- Module problem or maintenance necessary
- Module type: Distributed I/Os
- Output address: 33
- Channel information available
- User information available
- Module/submodule fault
- External module error
- Channel error detected
- Requested OB: Diagnostic interrupt OB (OB82)

The event ID is 16# 394.

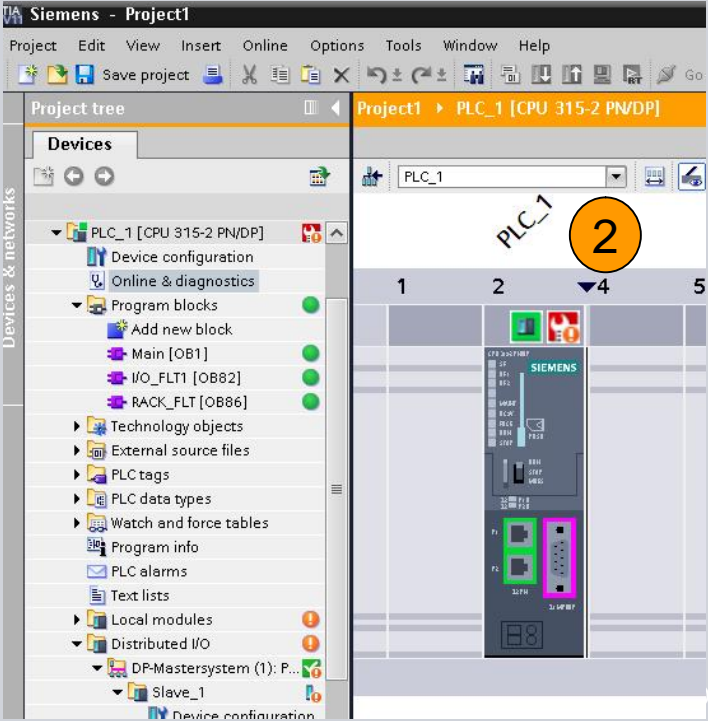
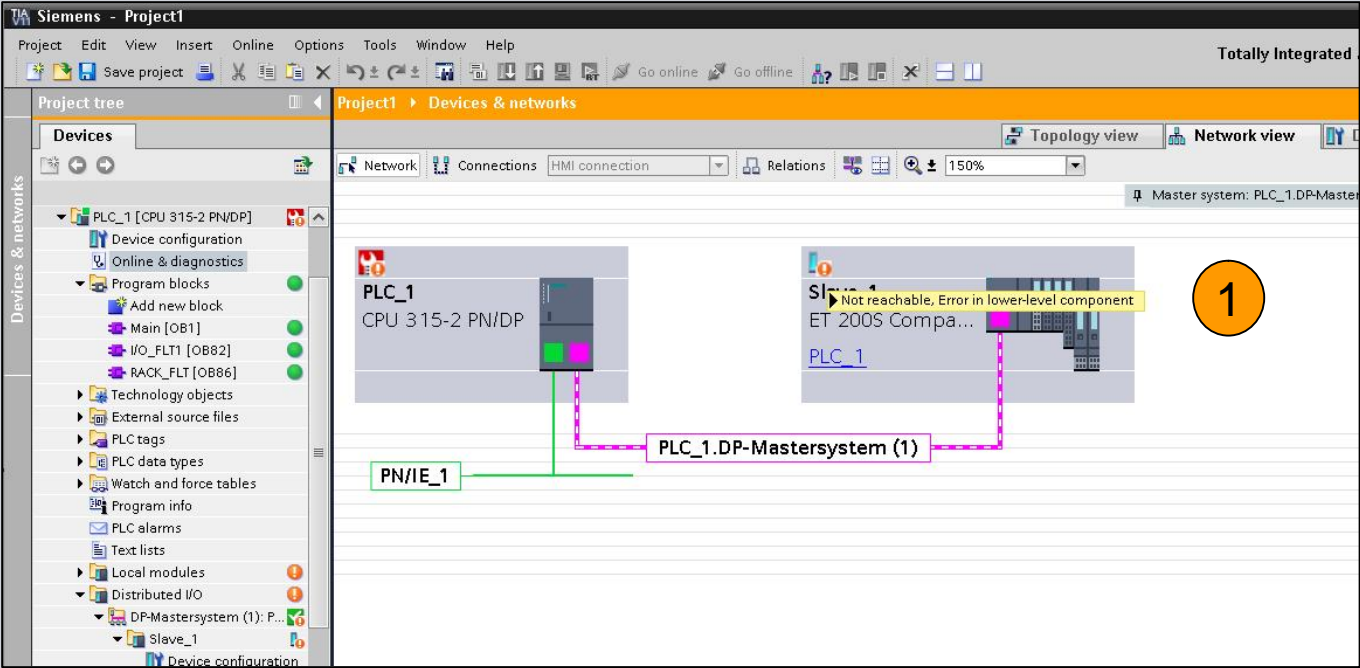
Exercise 4: Diagnostic



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



Exercise 4: Diagnostic



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

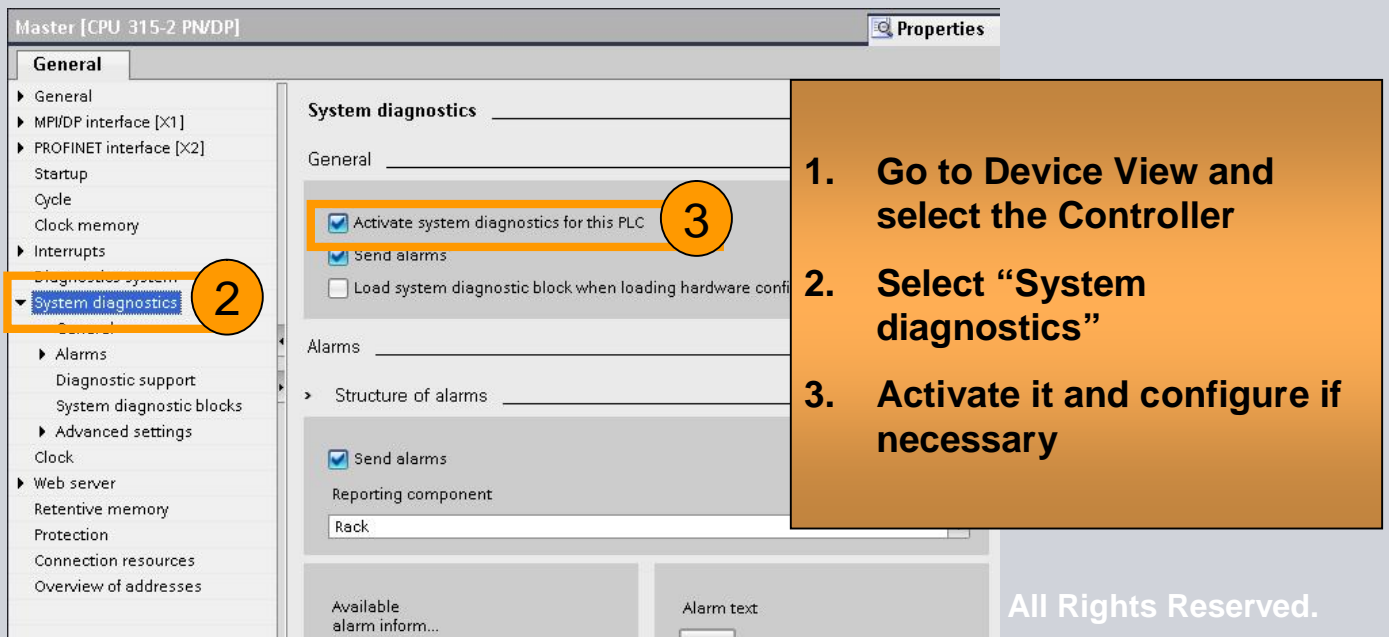
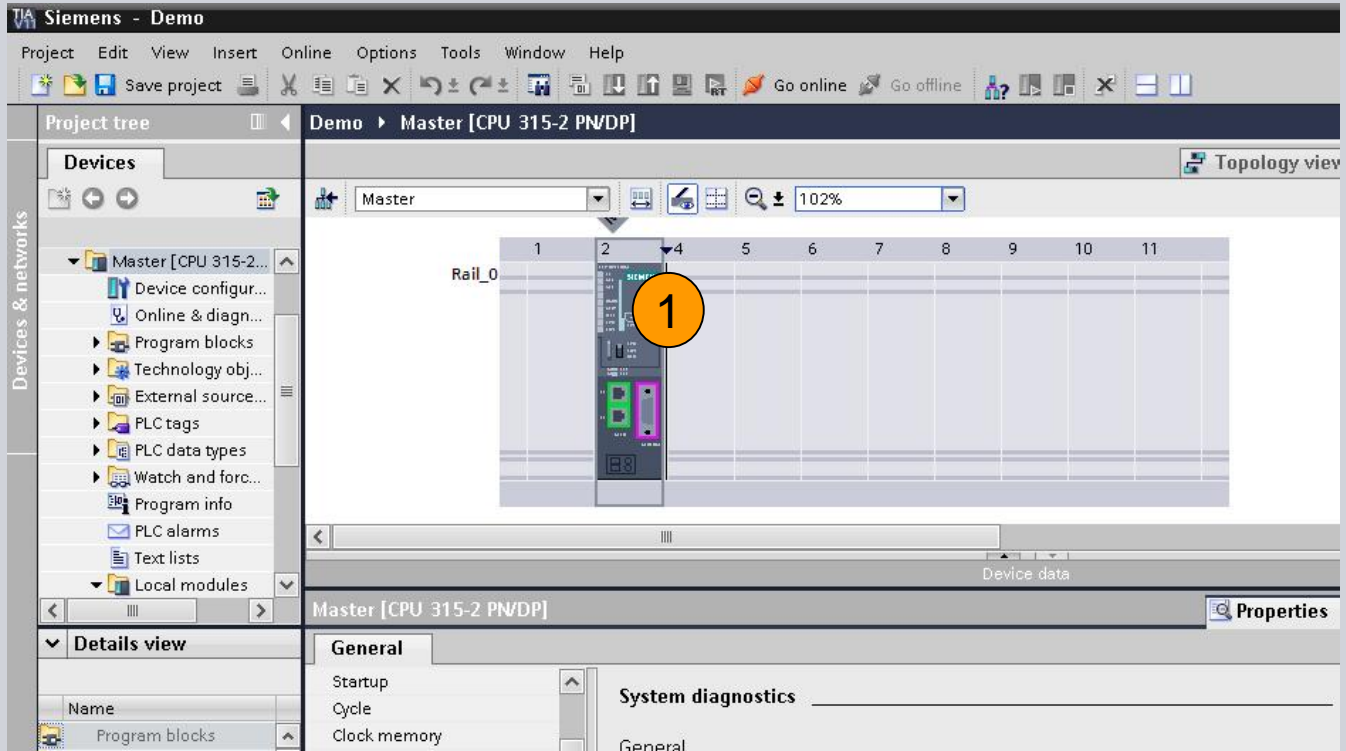
Exercise 4: Diagnostic

The screenshot shows the Siemens TIA Portal interface. On the left, the 'Project tree' is expanded to 'Watch and force tables', where 'Watchtable Web' is highlighted with a blue box and a circled '1'. On the right, the 'Default tag table' is displayed as a table with the following data:

	Name	Data type	Address	Retain	Visibl...	Av
1	InputData	Bool	%E...		<input checked="" type="checkbox"/>	
2	InputData_1	Bool	%E0.1		<input checked="" type="checkbox"/>	
3	InputData_2	Bool	%E0.2		<input checked="" type="checkbox"/>	
4	InputData_3	Bool	%E0.3		<input checked="" type="checkbox"/>	
5	InputData_4	Bool	%E0.4		<input checked="" type="checkbox"/>	
6	InputData_5	Bool	%E0.5		<input checked="" type="checkbox"/>	
7	InputData_6	Bool	%E0.6		<input checked="" type="checkbox"/>	
8	InputData_7	Bool	%E0.7		<input checked="" type="checkbox"/>	
9	OutputData	Bool	%A1.0		<input checked="" type="checkbox"/>	
10	OutputData_1	Bool	%A1.1		<input checked="" type="checkbox"/>	
11	OutputData_2	Bool	%A1.2		<input checked="" type="checkbox"/>	
12	OutputData_3	Bool	%A1.3		<input checked="" type="checkbox"/>	
13	OutputData_4	Bool	%A1.4		<input checked="" type="checkbox"/>	
14	OutputData_5	Bool	%A1.5		<input checked="" type="checkbox"/>	
15	OutputData_6	Bool	%A1.6		<input checked="" type="checkbox"/>	
16	OutputData_7	Bool	%A1.7		<input checked="" type="checkbox"/>	
17	OutputData_8	Bool	%A2.0		<input checked="" type="checkbox"/>	
18	OutputData_9	Bool	%A2.1		<input checked="" type="checkbox"/>	
19	<Add new>				<input checked="" type="checkbox"/>	

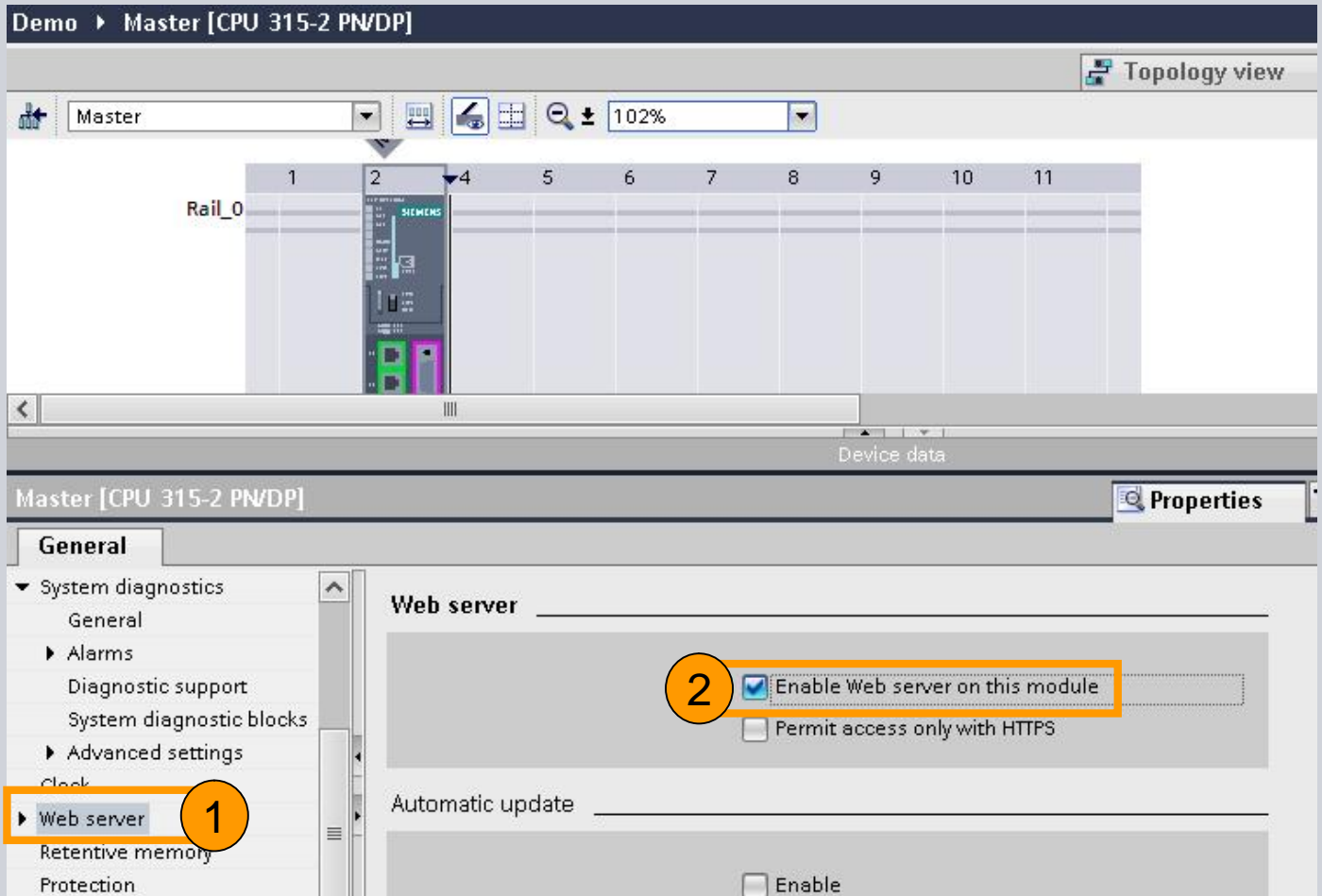
1. Select "Watch & Force Table" and add a Watch table for the Web interface.
2. Define variables

Exercise 4: Diagnostic



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

Exercise 4: Diagnostic



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

Exercise 4: Diagnostic

Properties
Controller [CPU 317-2 PN/DP]

General

- ▶ General
- ▶ MPI/DP interface [X1]
- ▶ PROFINET interface [X2]
- Startup
- Cycle
- Clock memory
- ▶ Interrupts
- Diagnostics system
- ▶ System diagnostics
- Clock
- ▼ **Web server**
 - Automatic update
 - Languages
 - User management
 - Watch tables
 - ▼ User-defined Web pages
 - Advanced
 - Display class of the alarm
 - Retentive memory
 - Protection
 - Connection resources
 - Overview of addresses

Web server

Enable Web server on this module
 Permit access only with HTTPS

Automatic update

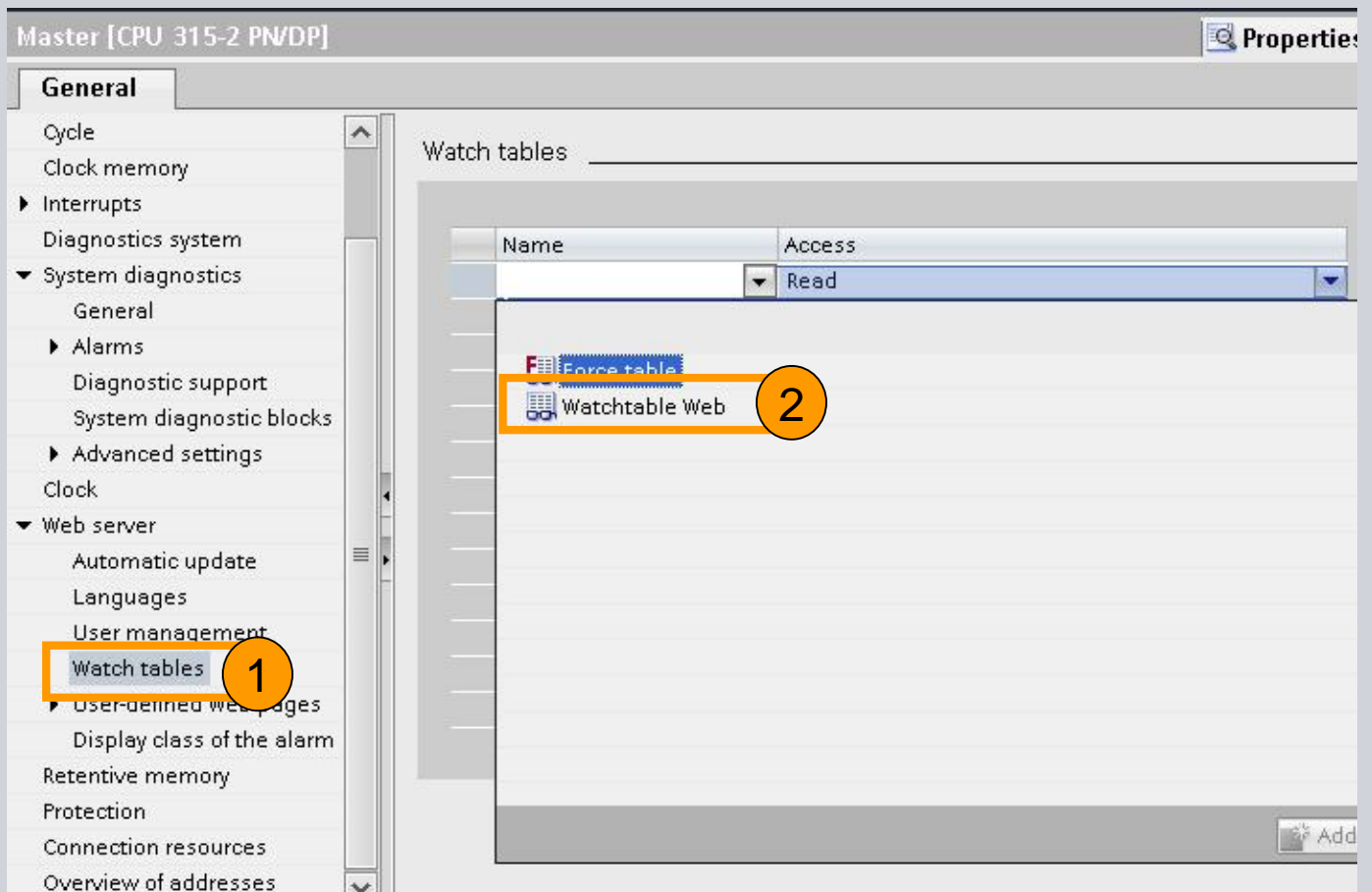
Enable
Update interval: 3 s

Languages

Activate	Web server language	Assign project language
<input type="checkbox"/>	German	None
<input checked="" type="checkbox"/>	English	English (United States)
<input type="checkbox"/>	French	English (United States)
<input type="checkbox"/>	Spanish	None
<input type="checkbox"/>	Italian	None
<input type="checkbox"/>	Japanese	None
<input type="checkbox"/>	Chinese (simplified)	None

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

Exercise 4: Diagnostic



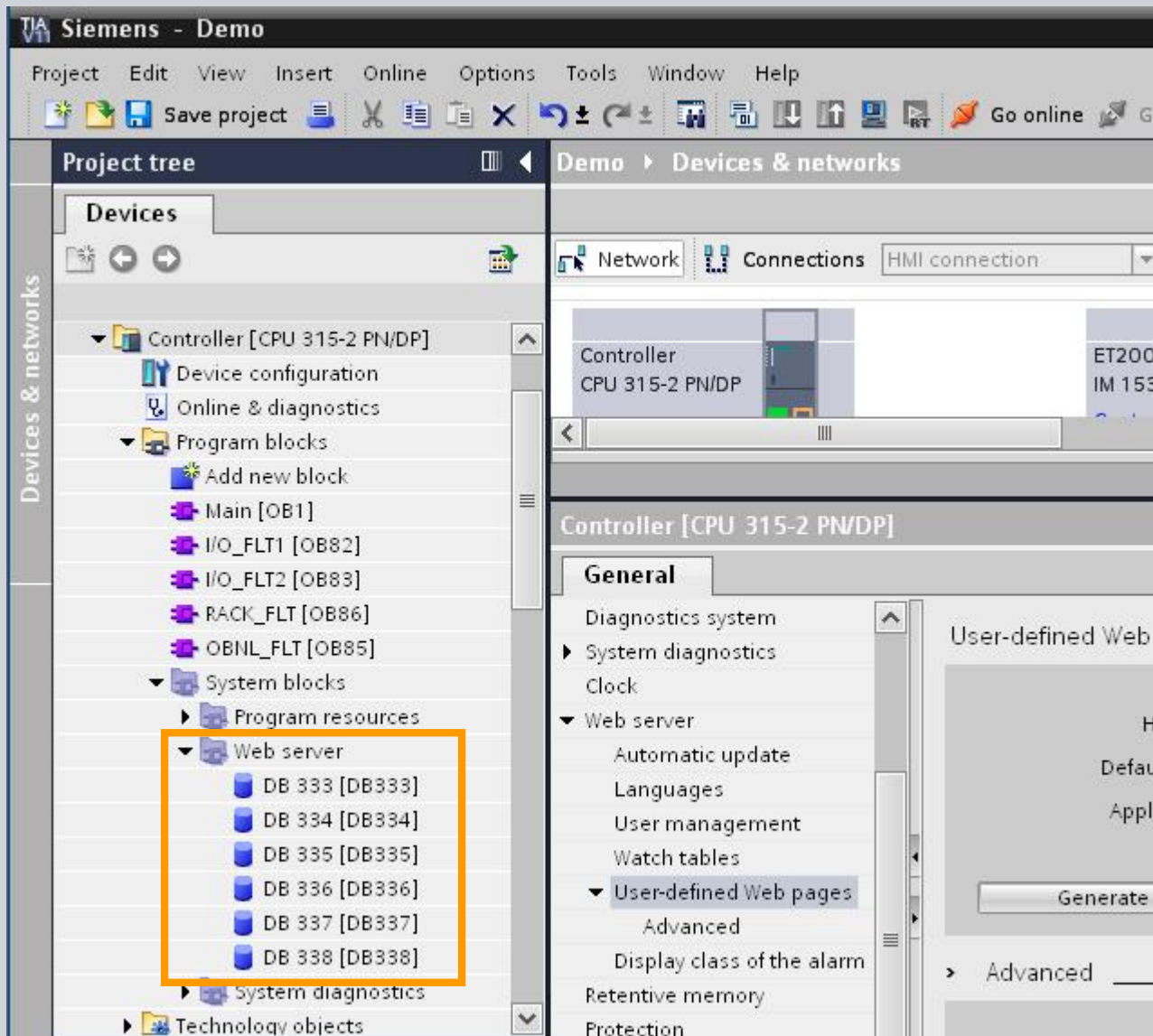
1. Select Watch table
2. Insert it to the Web interface

Exercise 4: User Defined Webpage

The screenshot displays the SIMATIC Manager interface for configuring a user-defined webpage. A 'Browse For Folder' dialog is open, showing the selection of the 'Userdefined Webpage' folder. The main window shows the 'User-defined Web pages' configuration panel with fields for HTML directory, default page, application name, and advanced settings like file types and database numbers. Numbered callouts 1-4 highlight key steps: 1. Selecting 'User-defined Web pages' in the left menu; 2. Selecting the directory and default page; 3. Defining file types and database numbers; 4. Clicking 'Generate blocks'.

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**

Exercise 4: User Defined Webpage



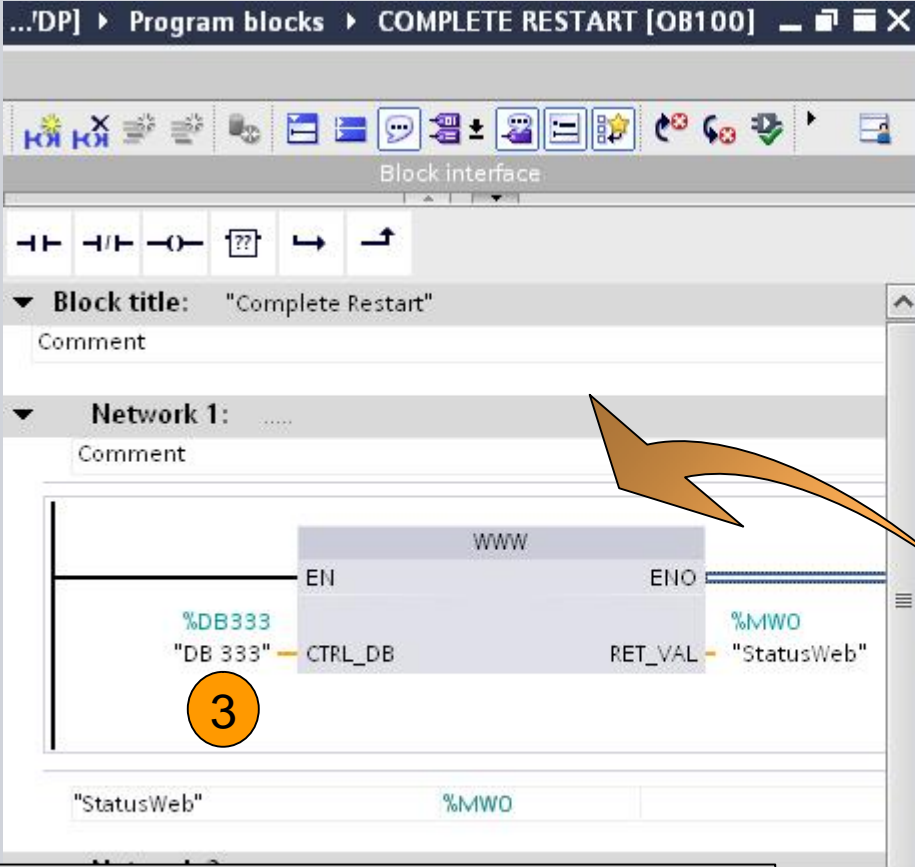
1. Web DBs are created for the Web server

Exercise 4: User Defined Webpage

Program blocks

- Add new block
- Main [OB1]
- I/O_FLT1 [OB82]
- I/O_FLT2 [OB83]
- RACK_FLT [OB86]
- OBN1_FLT [OB85]
- COMPLETE RESTART [OB100]**

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



Instructions

Options

- Favorites
- Basic instructions
 - General
 - Bit logic operations
 - Timer operations
 - Counter operations
 - Comparator operations
 - Math functions
 - Move operations
- Extended instructions
- Technology
- Communication
 - S7 communication
 - Open user communication
 - WEB Server**
 - WWW**

Topology view | Network view | Device view

Web DB number: 333

Fragment DB start number: 334

Exercise 4: User Defined Webpage

1. Download and test

The screenshot shows two overlapping browser windows. The background window is titled 'CPU319_Controller - Microsoft Internet Explorer bereitgestellt von CAT@Siemens XP SP2'. It displays the Siemens SIMATIC Manager web interface for a CPU319_Controller. The page includes a navigation menu on the left with options like 'Start page', 'Identification', 'Diagnostic Buffer', 'Messages', 'PROFINET', 'Tag status', 'Variable tables', and 'Intro'. The main content area shows the 'Diagnostic Buffer' with a table of events:

Number	Time	Date	Event
1	07:53:49:053 am	22.09.2006	Mode transition from STARTUP to RUN
2	07:53:49:052 am	22.09.2006	Request for manual warm restart
3	07:53:49:002 am	22.09.2006	Mode transition from STOP to STARTUP
4	07:53:49:077 am	22.09.2006	STOP caused by time switch being adjusted
5	07:53:49:077 am	22.09.2006	STOP caused by time switch being adjusted
6	07:53:49:077 am	22.09.2006	STOP caused by time switch being adjusted
7	07:53:49:077 am	22.09.2006	STOP caused by time switch being adjusted
8	07:53:49:077 am	22.09.2006	STOP caused by time switch being adjusted
9	07:53:49:077 am	22.09.2006	STOP caused by time switch being adjusted
10	07:53:49:077 am	22.09.2006	STOP caused by time switch being adjusted

The foreground window is titled 'Unbenanntes Dokument - Microsoft Internet Explorer' and shows a user-defined webpage with the following content:

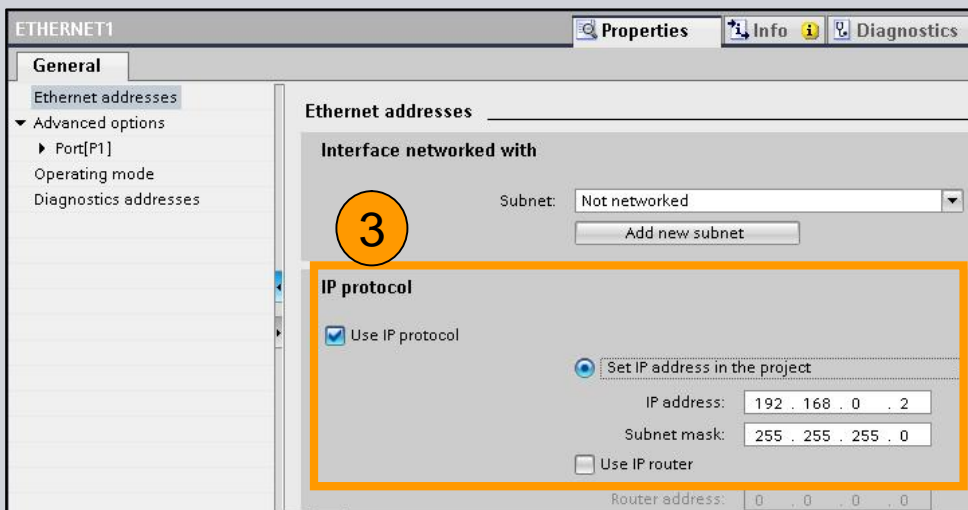
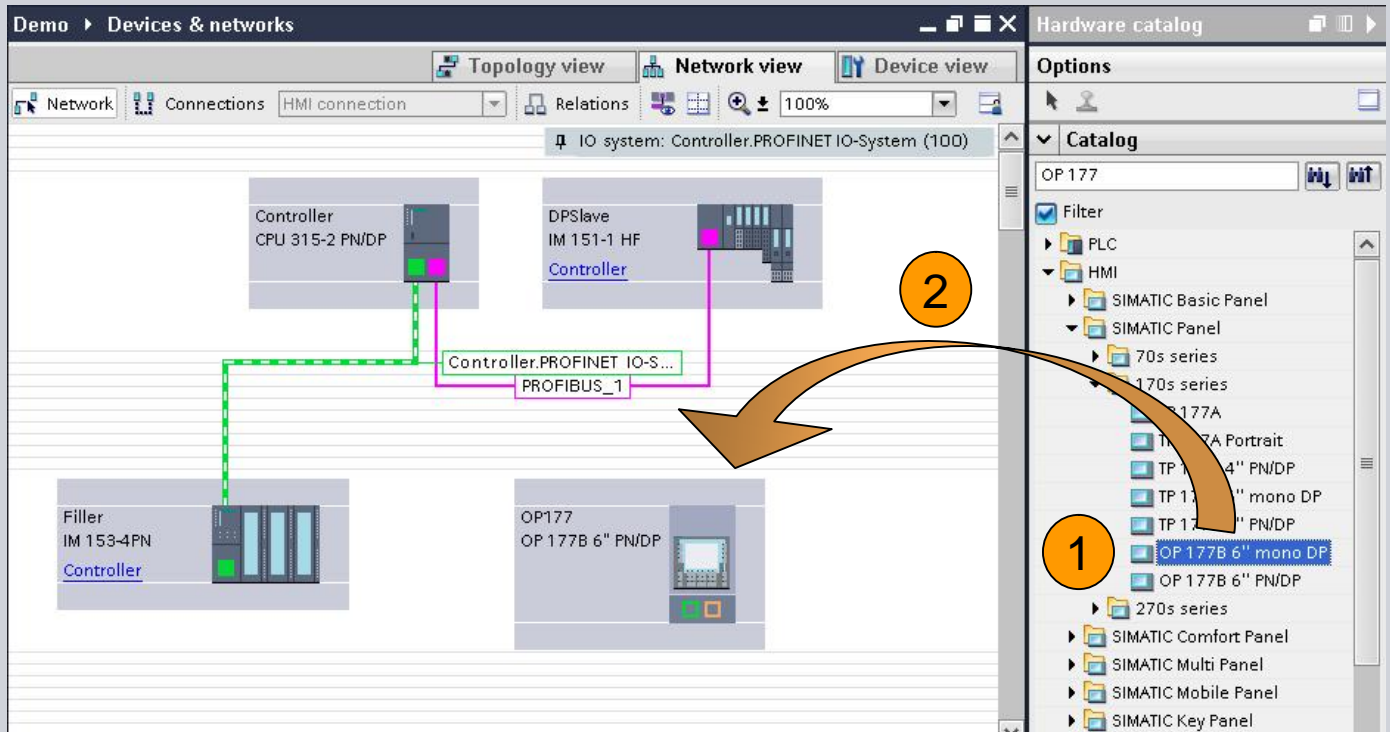
Address: D:\PROFINET Training\Userdefined Webpage\index.html

Welcome to the Power of PROFINET

The PROFINET logo is displayed in a stylized green font, with 'PROFI' on the top line and 'NET' on the bottom line, connected by a horizontal bar.

Exercise 5: Diagnostic / Panel

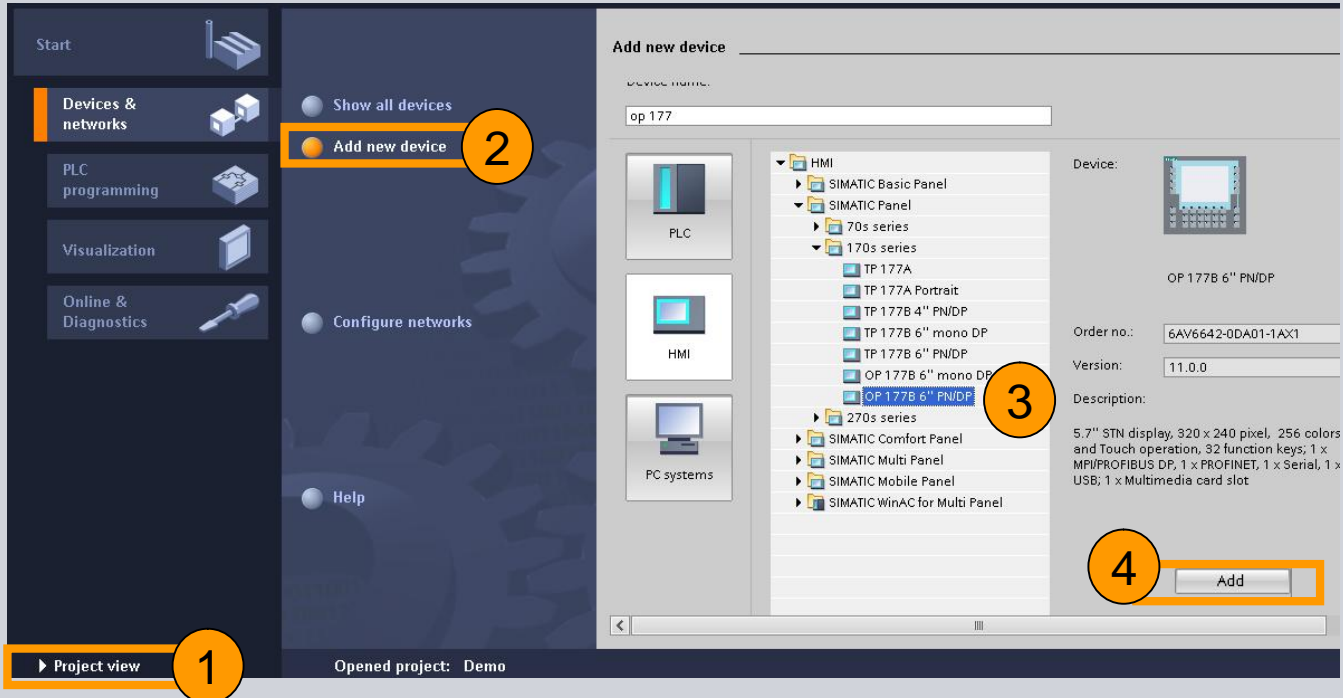
Possibility 1



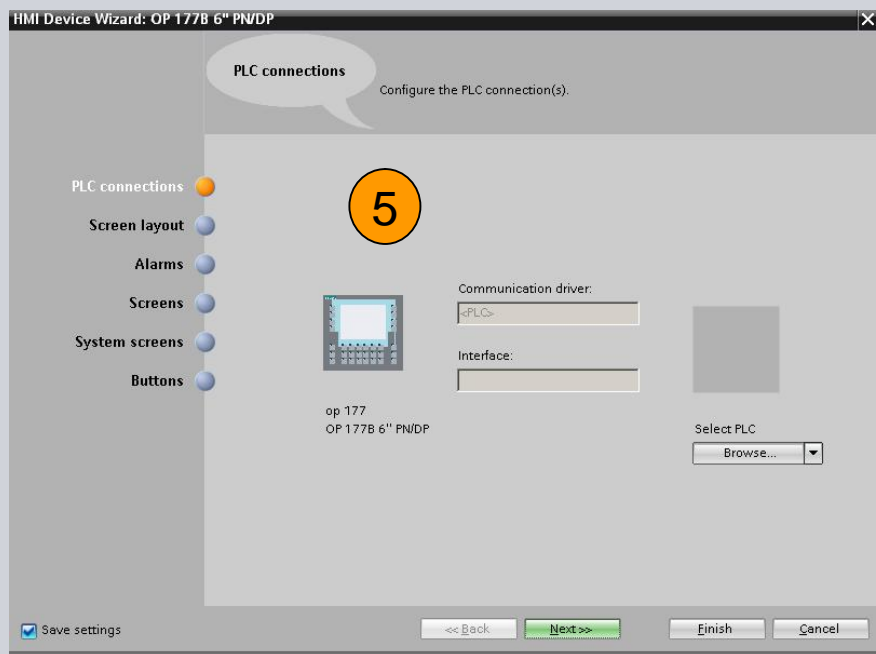
1. Select Panel
2. Drag and Drop to your Network View
3. Adjust IP-Settings if required

Exercise 5: Diagnostic / Panel

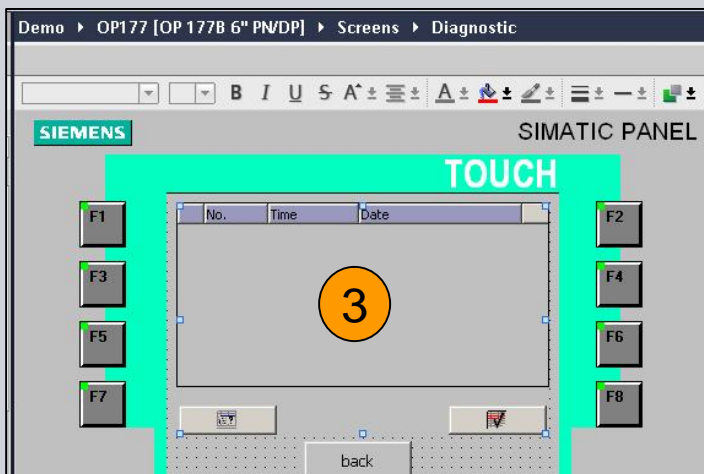
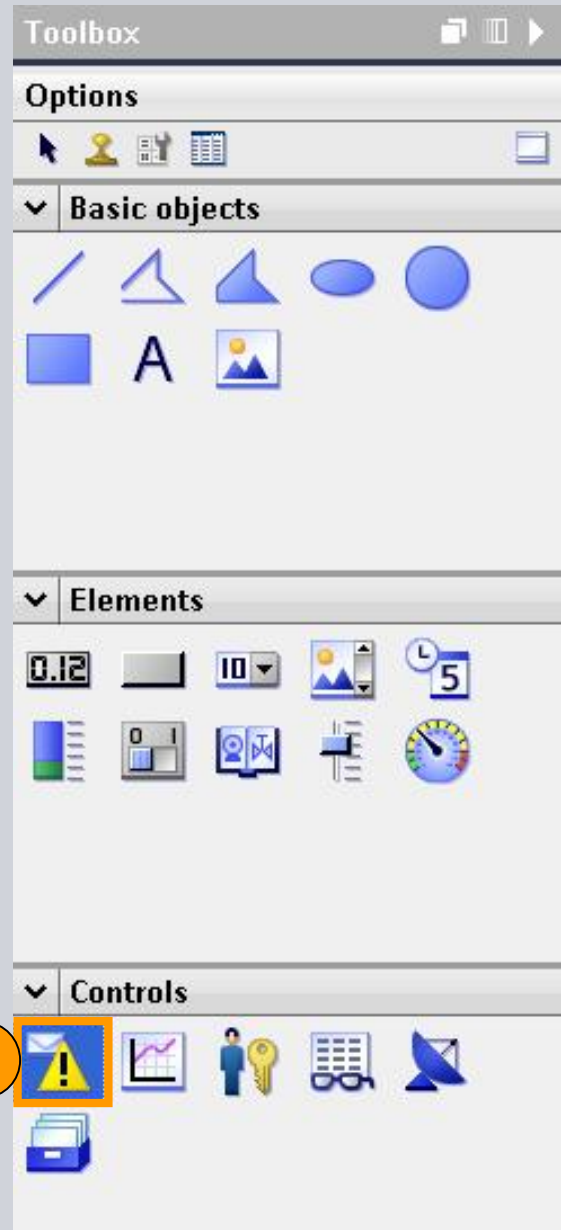
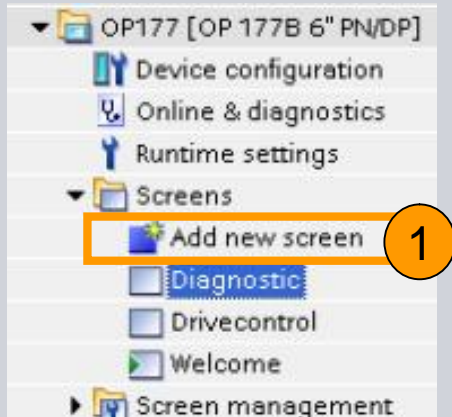
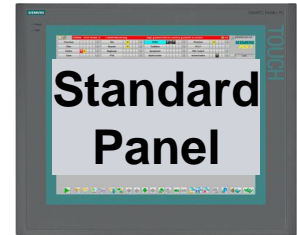
Possibility 2



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

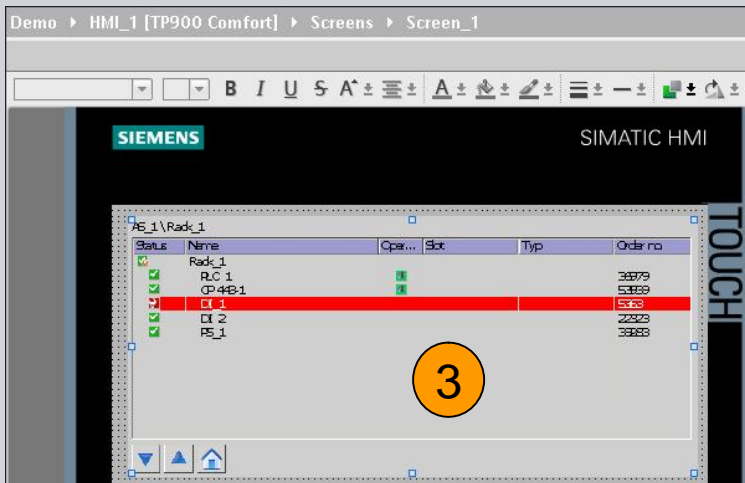
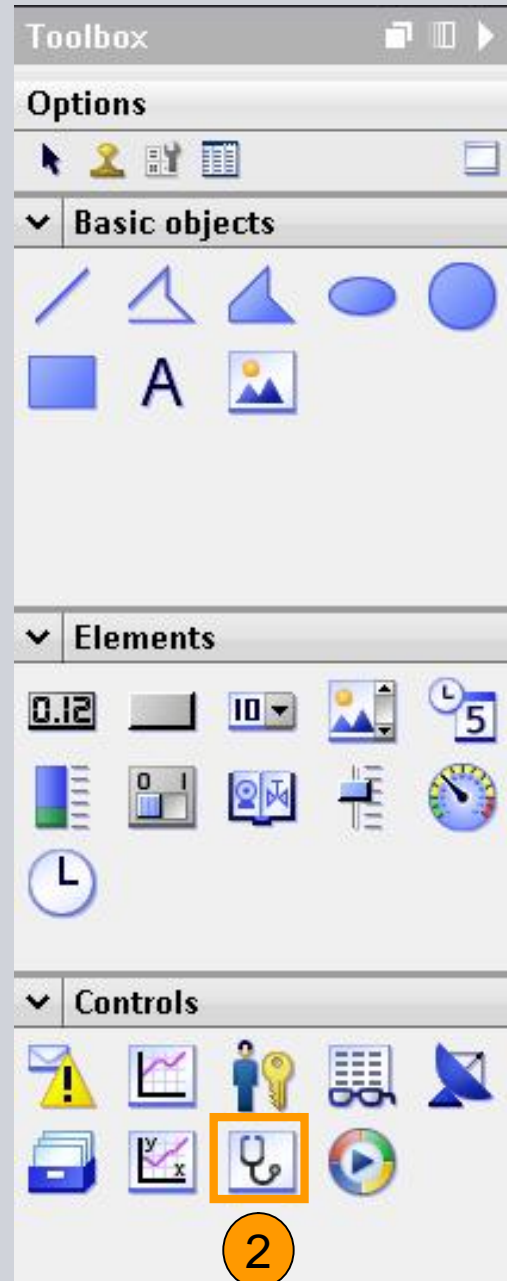
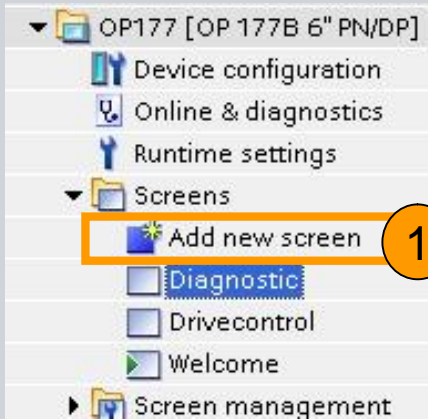


Exercise 5: Diagnostic Standard Panel



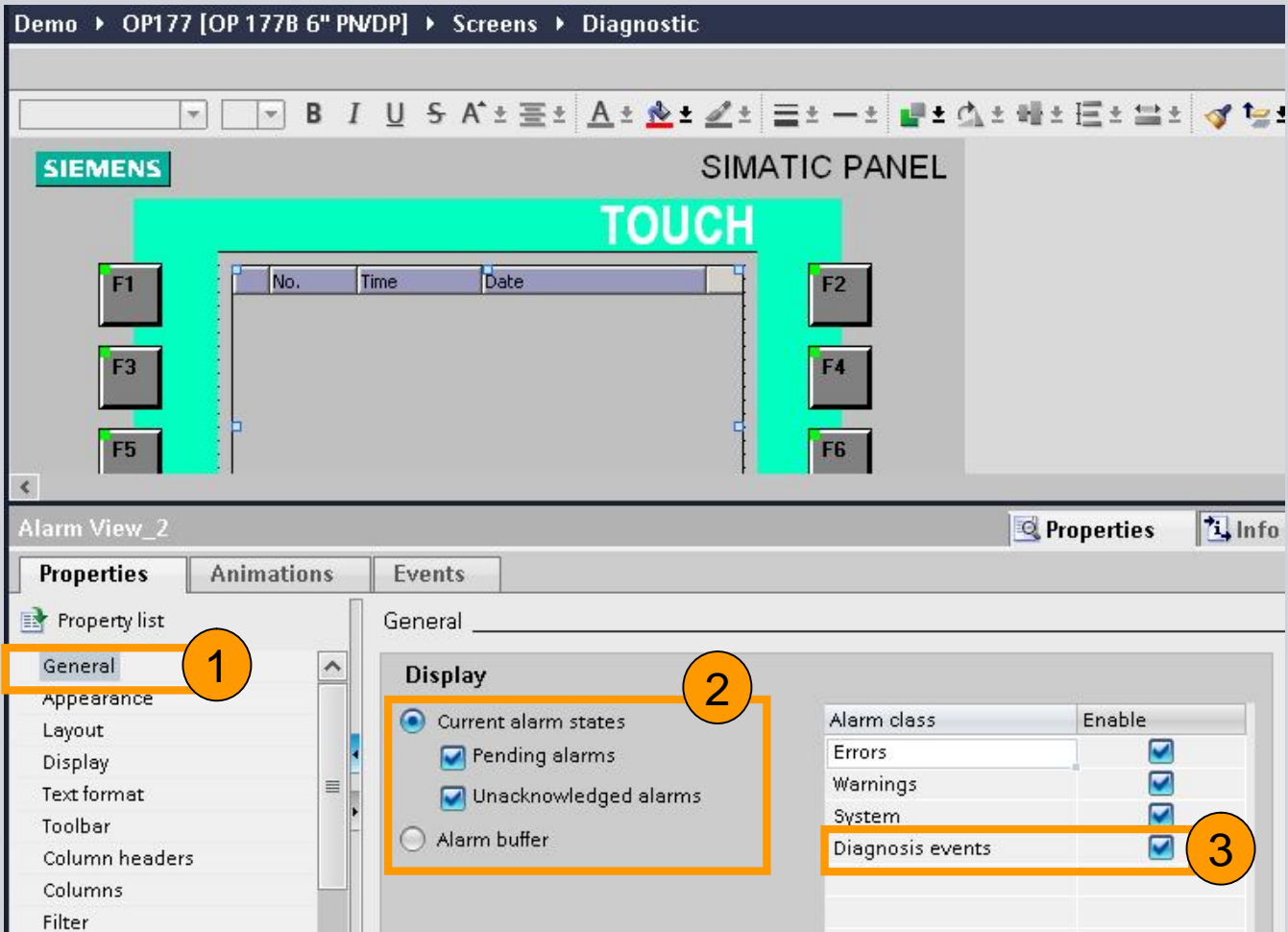
1. Select the Panel in "Project view" and add a new screen
2. Select Alarm View
3. Bring it to your screen

Exercise 5: Diagnostic for Comfort Panel



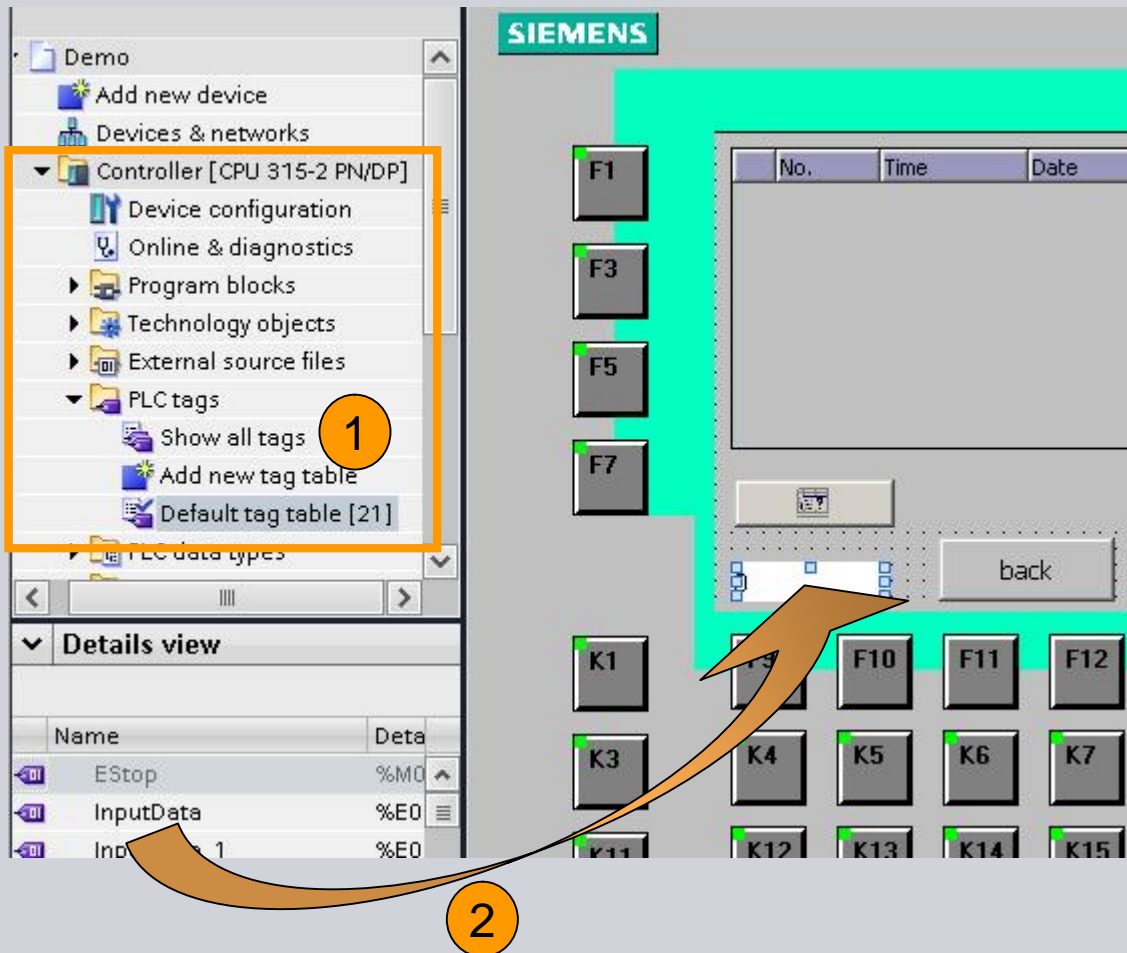
1. Add new screen
2. Besides "Alarm View" it is possible to select "System Diagnostic view" (Only available on Comfort Panel)
3. Bring it to your comfort panel screen.

Exercise 5: Diagnostic / Panel



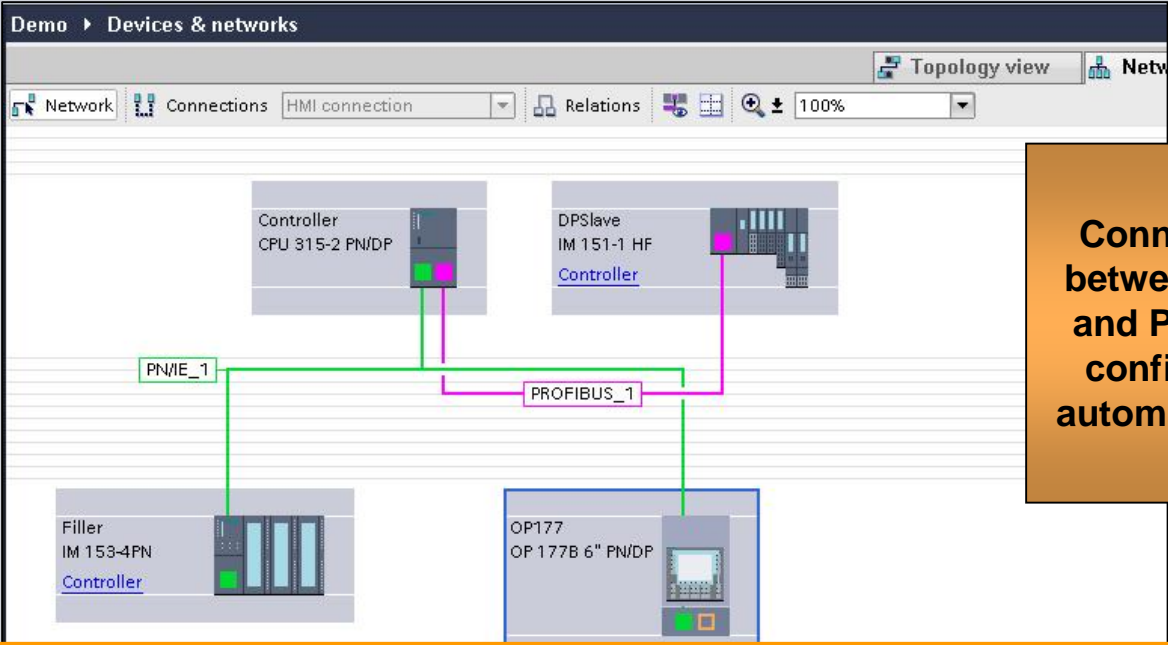
1. Go to Properties
2. Activate for "Current Alarm States"
3. Activate "Diagnosis events"

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!**

Exercise 5: Diagnostic / Panel



Connection between PLC and Panel is configured automatically!

Local connection name	Local end point	Local ID (hex)	Partner ID (hex)	Partner	Connection type
HMI_connection	OP177			Controller	HMI connection

Local connection name	Local end point	Local ID (hex)	Partner ID (hex)	Partner	Connection type
HMI_connection	OP177			Controller	HMI connection

HMI connection: HMI_connection

Properties

General

General

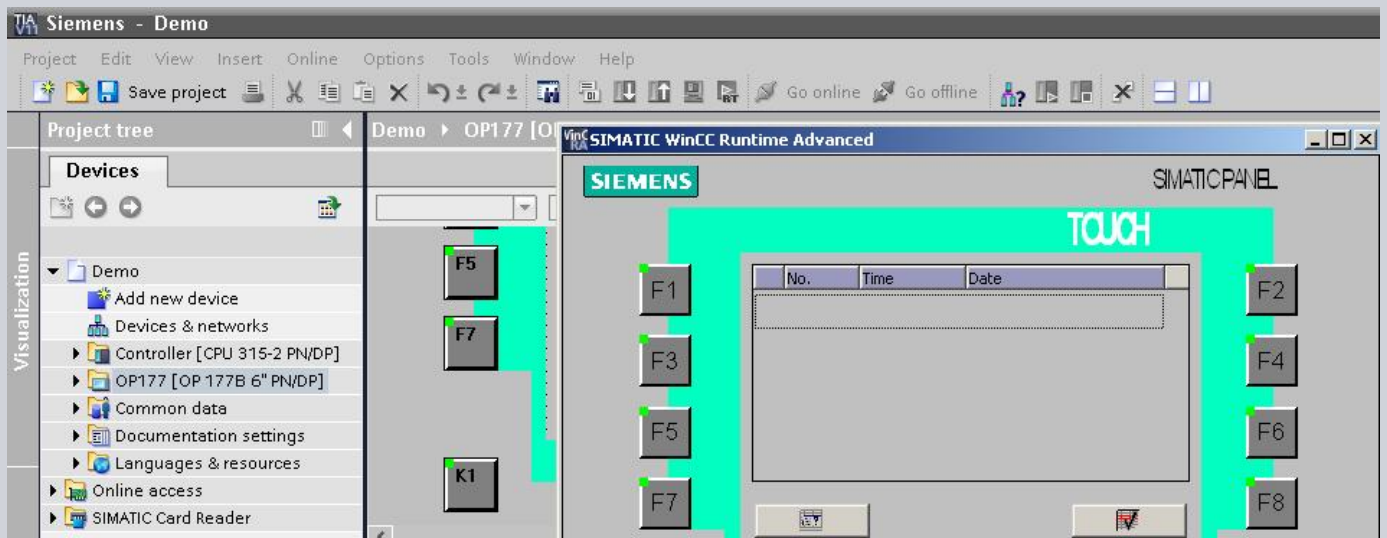
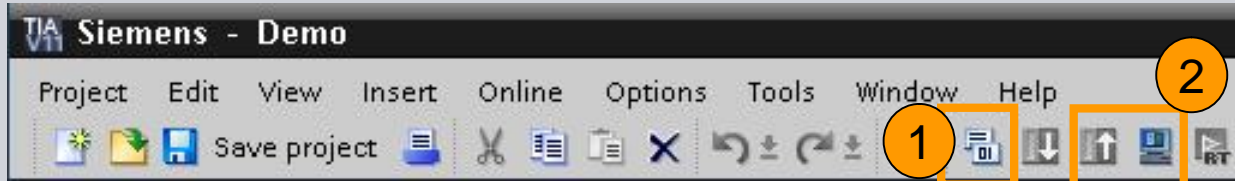
Protocol setting

Access point

Time synchronization

Local	Partner
End point: OP177	Controller
Interface: IE_CP_2, PROFINET_Inte	Controller, PROFINET int
Interface type: Ethernet/IP	Ethernet/IP
Subnet: PN/IE_1	PN/IE_1

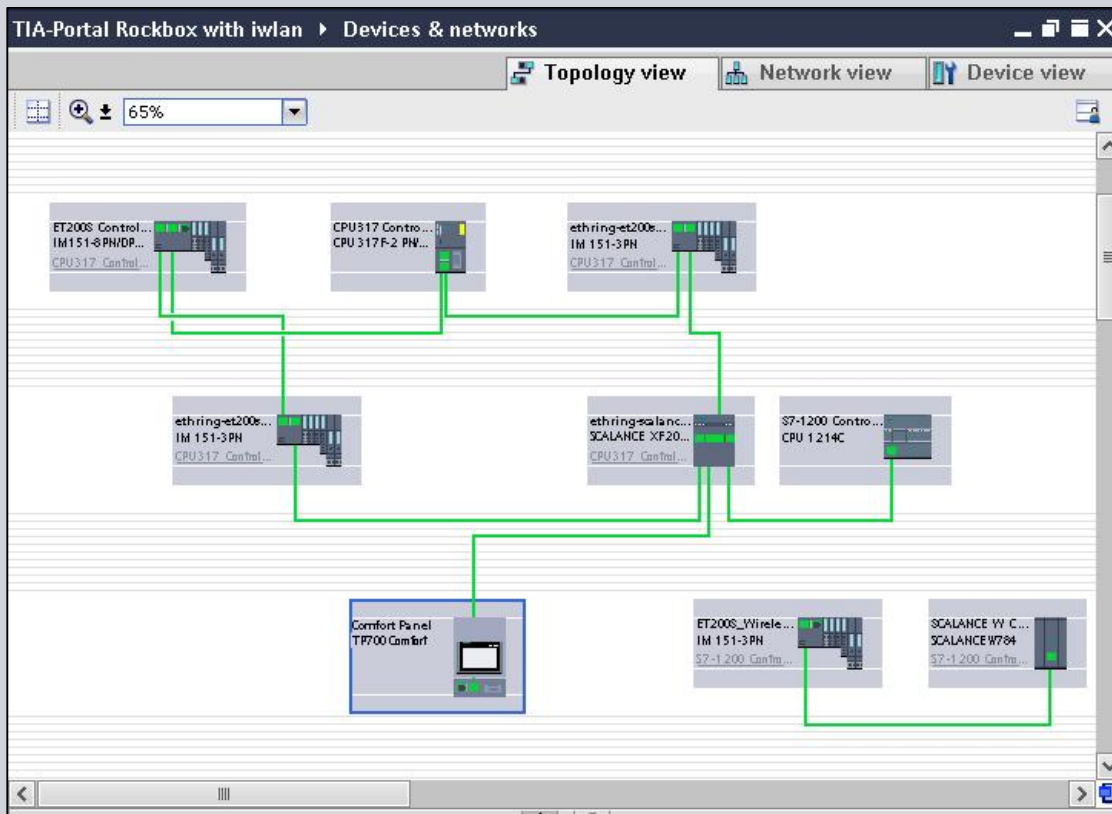
Exercise 5: Diagnostic / Panel



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

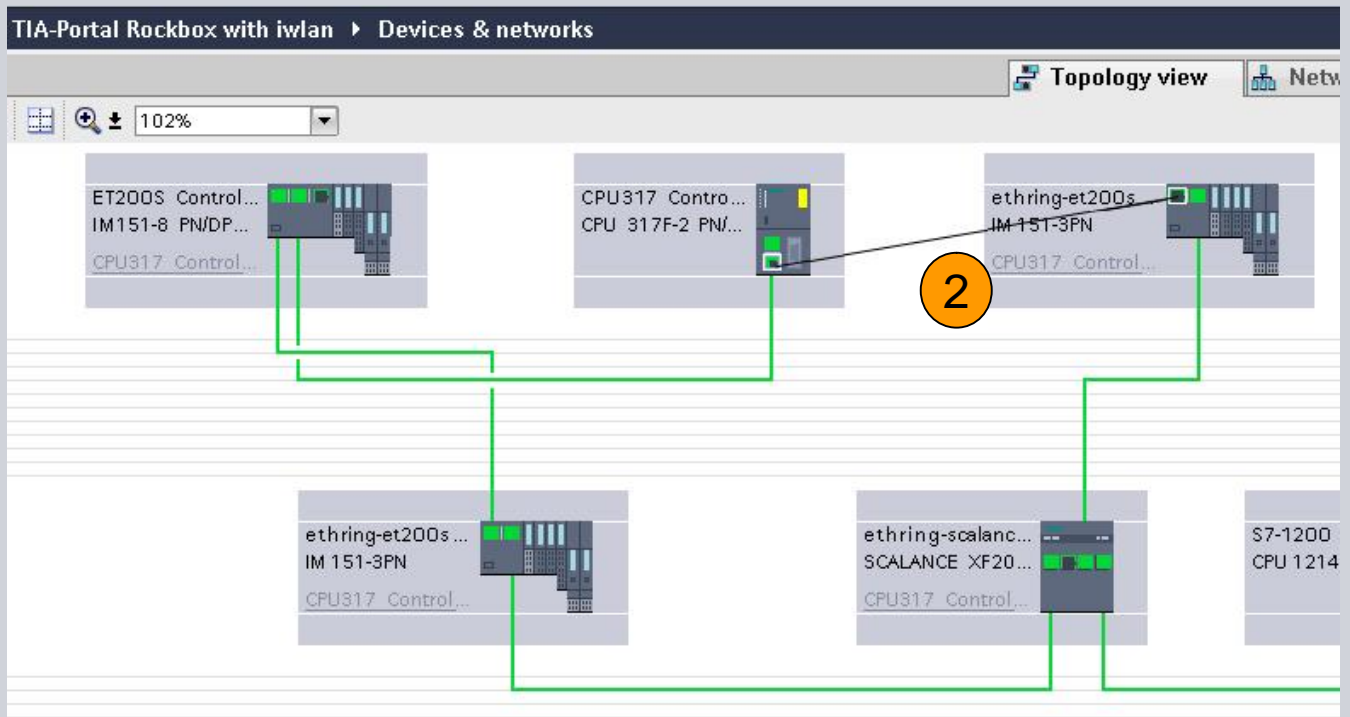
Exercise 6: PROFINET Redundancy

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



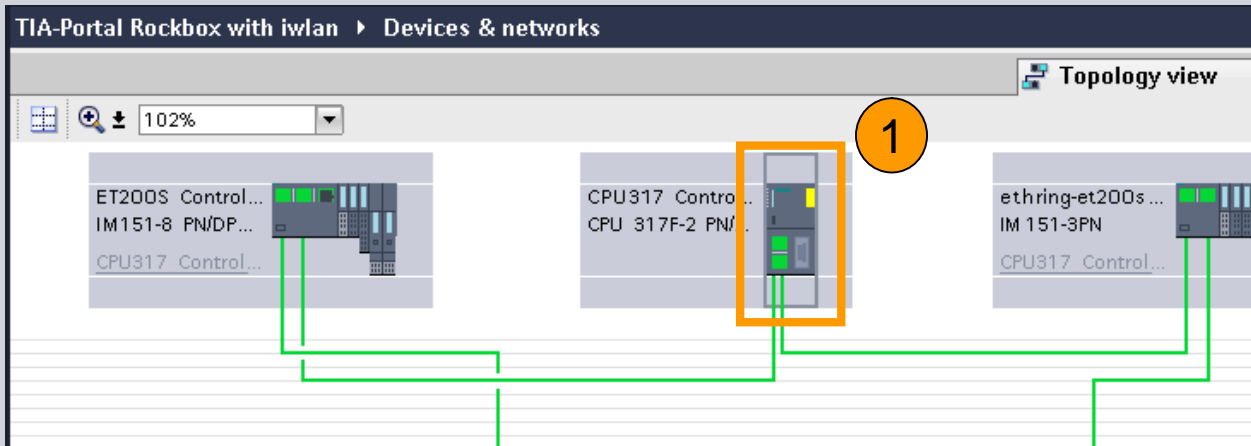
Exercise 6: PROFINET Redundancy

1



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

Exercise 6: PROFINET Redundancy



CPU317 Controller [CPU 317F-2 PN/DP] Properties Info

General

- General
- Fail-safe
- MPI/DP interface [X1]
- PROFINET interface [X2]
 - General
 - F-parameter
 - Ethernet addresses
 - Advanced options
 - Interface options
 - Media redundancy**
 - Real time settings
 - Port [X2 P1 R]
 - Port [X2 P2 R]
 - Time-of-day synchronizat...
 - Operating mode
 - Diagnostics addresses

Media redundancy

Media redundancy role: **Manager (auto)** 2

Ring port 1: PROFINET interface_1 [X2]\Port_1 [X2 P1]

Ring port 2: PROFINET interface_1 [X2]\Port_2 [X2 P2]

Diagnostics interrupts

ethring-et200s-upperight [IM 151-3PN] Properties

General

- General
- PROFINET interface [X1]
 - General
 - Ethernet addresses
 - Advanced options
 - Interface options
 - Media redundancy**
 - Real time settings
 - Port [X1 P1]
 - Port [X1 P2]

Media redundancy

Media redundancy role: **Client** 2

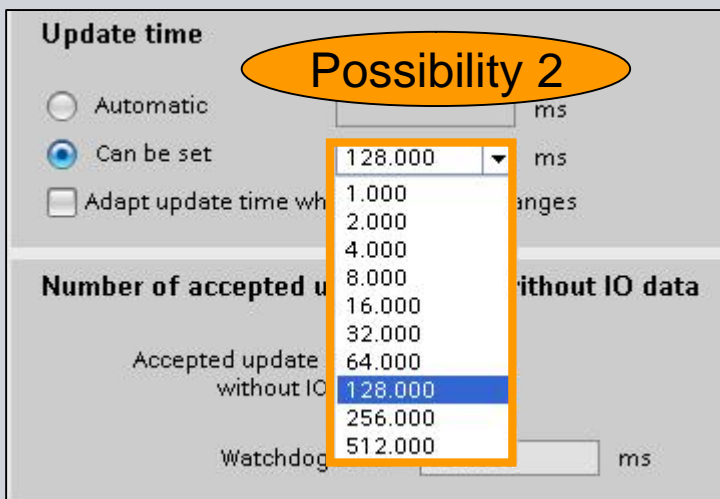
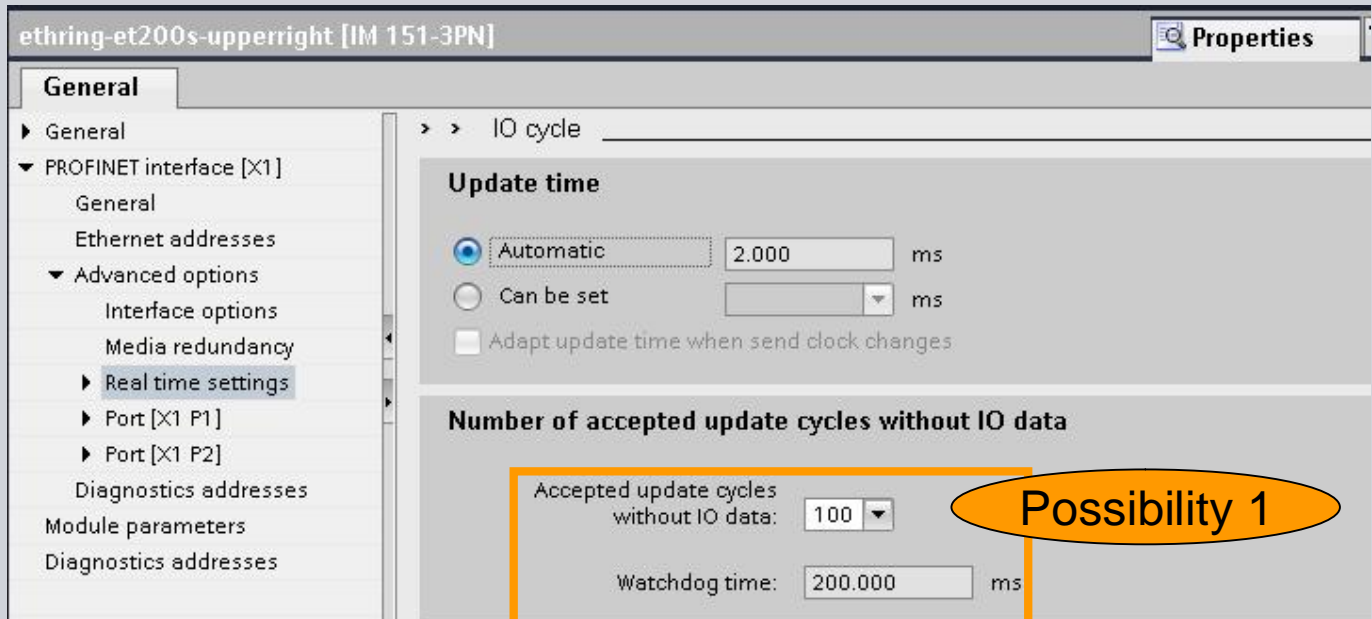
Ring port 1: PROFINET interface [X1]\Port_1 [X1 P1]

Ring port 2: PROFINET interface [X1]\Port_2 [X1 P2]

Diagnostics interrupts

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

Exercise 6: PROFINET Redundancy

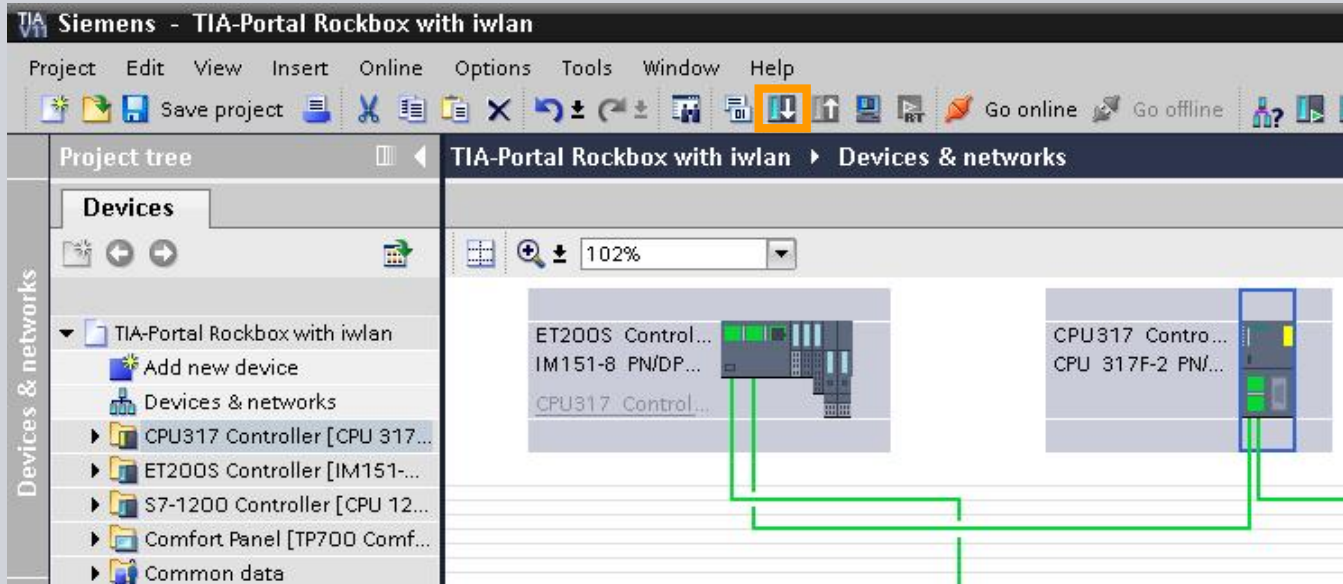


1. Adjust the time behavior of your IO-Devices in the Ring that a Watchdog of 200ms is configured!

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!

Exercise 6: PROFINET Redundancy



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

Congratulation, you made it!!





SIEMENS

Thank you for your attention!

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