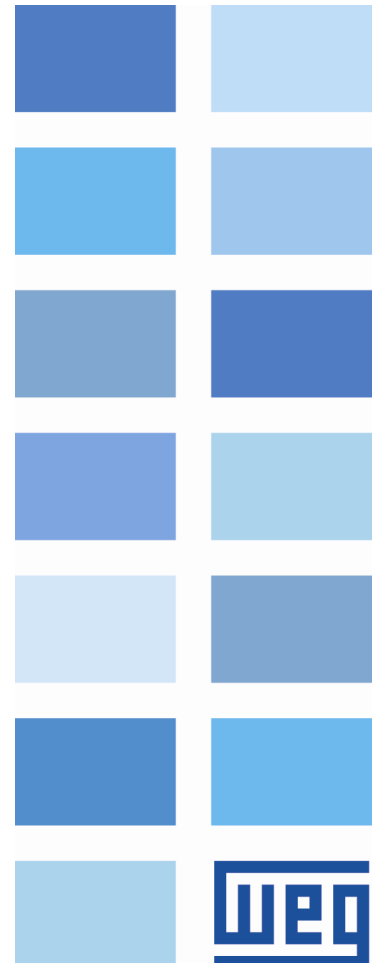


Operation on PROFINET S2 network using Siemens Simatic S7-1500

PROFINET S2

Application Note





PROFINET S2 Application Note

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1 DESCRIPTION

This application note is intended to provide a description of how to program a CFW11 frequency inverter, SRW01-ETH smart relay and SSW900 soft-starter to communicate in PROFINET S2 network using Siemens Simatic S7-1500 PLC.

This document is meant for trained personnel working with the described equipment and PROFINET S2 network installation, besides a good knowledge of automation and programmable logic controllers, in particular about Siemens software.

1.1 REFERENCE DOCUMENTS

This application note was developed based on the following documents and tools:

Document / Tool	Version	Source
CFW-11 User's Manual	0899.5620 / 09	WEG
CFW-11 Frequency Inverter Programming Manual	0899.5620 / 09 (6.0x)	WEG
CFW-11 Anybus-CC User's Manual	0899.5750 / 08	WEG
SRW01-ETH User's Manual	10002415831 / 02 (2.0x)	WEG
SRW01-ETH User's Manual Addendum	10010155561 / 00 (3.0x)	WEG
SRW01-ETH Ethernet Communication Manual	10002708521 / 03	WEG
SSW900 User's Manual	10005616165 / 03	WEG
SSW900 Soft-Starter Programming Manual	10003989140 / 05 (1.5x)	WEG
SSW900 Anybus PROFINET S2 User's Guide	10009788912 / 00	WEG
TIA Portal PLC programming software	17.00	Siemens
WPS	3.00	WEG

1.2 ARCHITECTURE

1.2.1 Line Topology

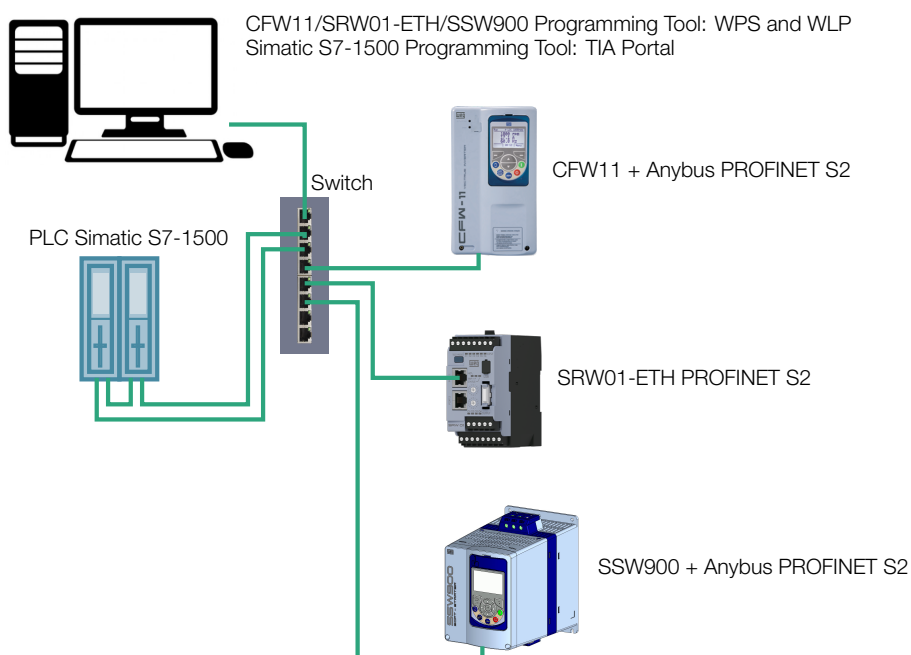


Figure 1.1: Network devices in linear topology

1.2.2 Ring Topology

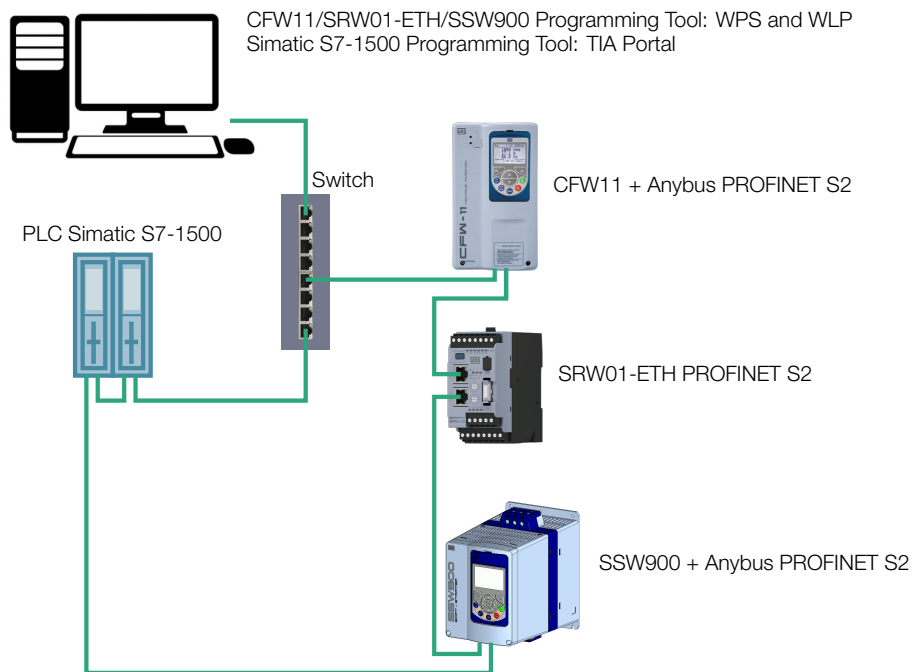


Figure 1.2: Network devices in ring topology

1.3 CFW11

- Equipment: Frequency converter CFW11 version 6.50.
- Accessory: Anybus PROFINET S2.

1.4 SRW01-ETH

- Equipment: Smart relay SRW01-ETH version 3.00.
- Programming tool: WLP version 11.10.

1.5 SSW900

- Equipment: Soft-starter SSW900 version 1.50.
- Accessory: Anybus PROFINET S2.
- Programming tool: WPS version 3.00.

1.6 SIMATIC S7-1500

- CPU:1513R-1 PN version 2.09.
- Programming tools: TIA portal version 17.00 SP1.

1.7 SCALANCE XC-208

- Equipment: Switch SCALANCE XC-208 version 4.02.

1.8 PASSIVE NETWORK COMPONENTS

For passive network components - cables, ethernet switch - we recommend using certified components for industrial applications. Please refer to the product documentation for information about the proper network installation.

2 IP ADDRESS AND NETWORK CONFIGURATION

All network devices must have a valid configuration, which means IP addresses in the same subnet. For this example we will use the following settings:

- Subnet mask: 255.255.255.0
- IP addresses: each device must have a unique IP address.
 - PC: 192.168.0.20
 - Simatic S7-1500 CPU 1: 192.168.0.1
 - Simatic S7-1500 CPU 2: 192.168.0.2
 - Scalance XC208: 192.168.0.3
 - CFW11: 192.168.0.10 (as described in Chapter 3).
 - SRW01-ETH: 192.168.0.11 (as described in Chapter 3).
 - SSW900: 192.168.0.12 (as described in Chapter 3).

2.1 PC IP ADDRESS CONFIGURATION

In Windows, go to "Settings", "Network Connections" and open "Properties" of the desired Ethernet interface:

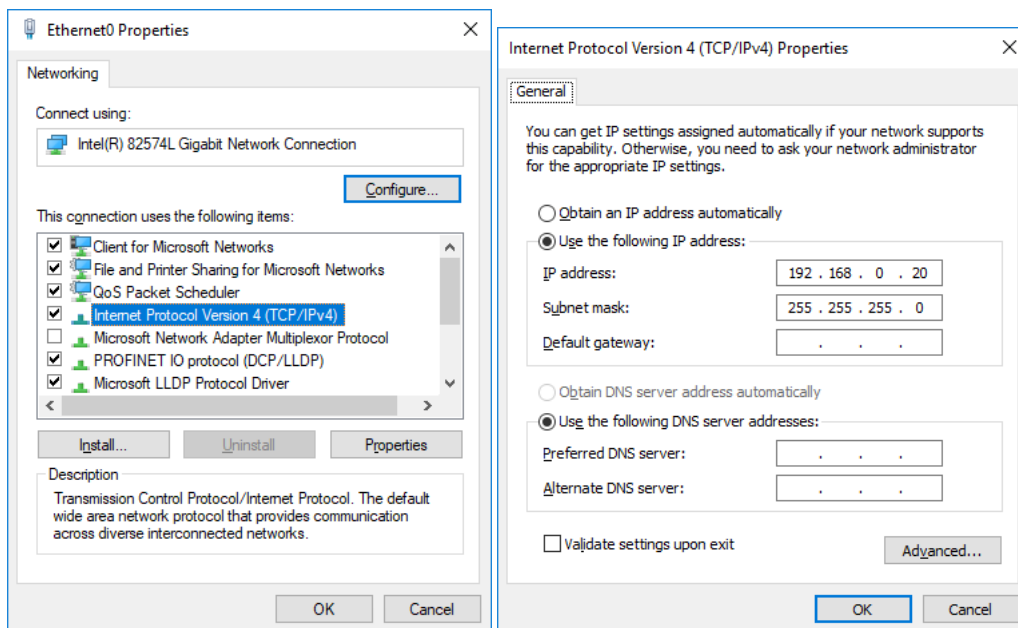


Figure 2.1: PC IP Address Configuration

3 SERVERS CONFIGURATION

This section describes the main configurations for CFW11 frequency inverter, SRW01-ETH smart relay and SSW900 soft-starter operation in PROFINET S2 network.

Refer to the CFW11, SRW01-ETH and SSW900 programming manual for the necessary configurations related to other device functions, such as motor configuration, protections, etc.

3.1 CFW11

The configuration can be done via keypad.

3.1.1 Ethernet Interface

- P843 IP Address Config: **0** (Parameters).
- P844...P847 IP Address: **192.168.0.10**.
- P848 CIDR: **255.255.255.0**.
- P849...P852 Gateway: **0.0.0.0**.



NOTE!

After changing these configurations, for the modification to be effective, the equipment must be turned off and on again.

3.1.2 Local/Remote

CFW11 has two operation modes: local and remote. For each operation mode, it is necessary to define the source that it will use to receive commands, like start/stop, fault reset. For this application, considering PROFINET S2 accessory installed, the following control sources have been defined:

- Local: keypad will control CFW11 in local mode.
- Remote: PROFINET S2 will control CFW11 in remote mode.
- Local/Remote transition: the definition if the device is in local or remote mode will be controlled by PROFINET S2 commands (remote mode at power on).

Based on this, the following configurations have been programmed:

- P220 LOC/REM Selection Src: **8** (Anybus-CC REM).
- P222 REM Reference Sel: **10** (Anybus-CC).
- P226 REM FWD/REV Sel: **7** (Anybus-CC H).
- P227 REM Run/Stop Sel: **3** (Anybus-CC).
- P228 REM JOG Selection: **4** (Anybus-CC).

3.1.3 Communication Error

For CFW11, the following events lead to error indication:

- When cyclic communication is active and it is interrupted.

- When cyclic communication is active and master is in "Run" mode, and then goes to "Idle" mode.

CFW11 will indicate A129 or F229 (Anybus Offline). It is important to define the action CFW11 will take in case of communication error. If CFW11 was running the motor via network command, CFW11 should also perform a general disable. Based on this, the following configurations have been programmed:

- P313 Action for Communic. Error: 2 (General Disable).

3.1.4 I/O Data Configuration

CFW11 has a set of configurations where it is possible to define any device data to exchange with network master. For each application, it is necessary to consult the programming manual which describes the entire list of device data that can be programmed for I/O data and define the data to communicate with the master.

Considering PROFINET S2 accessory installed, for this application, CFW11 will exchange the following I/O data with network master:

Mapped Inputs	Size
P680 Logical Status	16-bit (2 bytes)
P681 Speed in 13 bits	16-bit (2 bytes)
TOTAL	2 Words (4 bytes)

Mapped Outputs	Size
P686 Anybus-CC Control	16-bit (2 bytes)
P687 Anybus-CC Speed Ref.	16-bit (2 bytes)
TOTAL	2 Words (4 bytes)

3.2 SRW01-ETH

The configuration can be done via keypad or USB using the WLP software.

3.2.1 Ethernet Interface

- P760 IP Address Config: **0** (Parameters).
- P761...P764 IP Address: 192.168.0.**11**.
- P765 CIDR: 24.
- P766...P769 Gateway: 0.0.0.0.

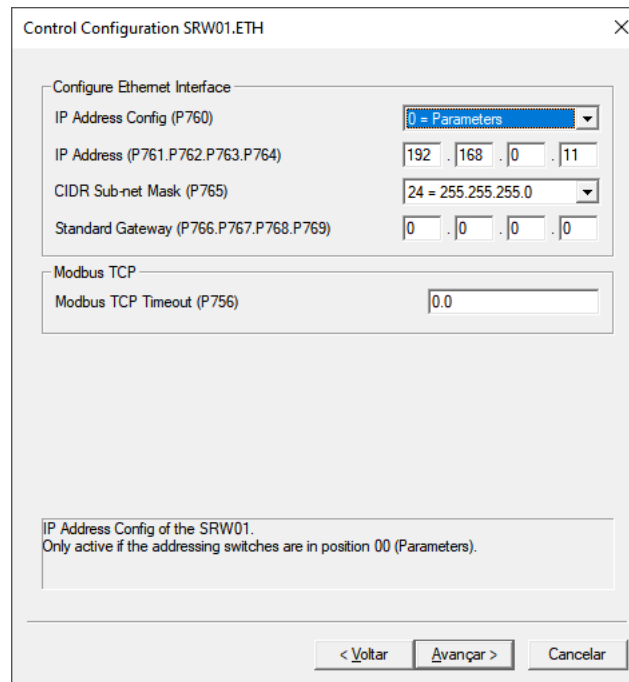


Figure 3.1: SRW01-ETH - IP address configuration



NOTE!

After changing these configurations, for the modification to be effective, the equipment must be turned off and on again.

3.2.2 Local/Remote

SRW01-ETH has two operation modes: local and remote. For each operation mode, it is necessary to define the source that it will use to receive commands, like start/stop, fault reset. For this application, the following control sources have been defined:

- Local: keypad will control SRW01-ETH in local mode.
- Remote: PROFINET S2 will control SRW01-ETH in remote mode.
- Local/Remote transition: the definition if the device is in local or remote mode will be controlled by PROFINET S2 commands (remote mode at power on).

Based on this, the following configurations have been programmed:

- P220 Local/Remote Selection: **7** (Fieldbus REM).
- P229 Local Command Selection: **1** (HMI).
- P232 Remote Command Selection: **3** (Fieldbus).

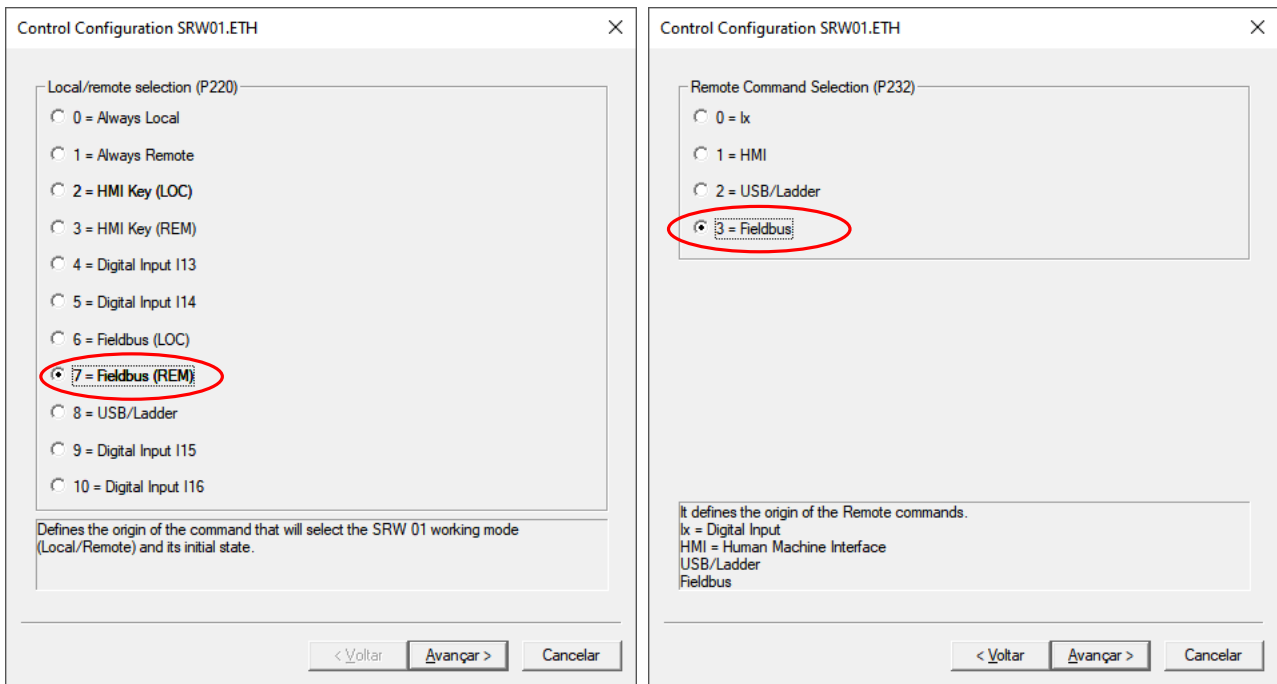


Figure 3.2: SRW01-ETH - Local/Remote configuration

3.2.3 Communication Error

For SRW01-ETH, the following events lead to error indication:

- When cyclic communication is active and it is interrupted.
- When cyclic communication is active and master is in "Run" mode, and then it goes to "Idle" mode.

SRW01-ETH will indicate E0129 (Communication Offline). It is important to define the action SRW01-ETH will take in case of communication error. If SRW01-ETH was running the motor via network command, SRW01-ETH should also perform a general disable. Based on this, the following configurations have been programmed:

- P313 Action for Communic. Error: 2 (Motor Turned Off and the Commands are Reset).

3.2.4 I/O Data Configuration

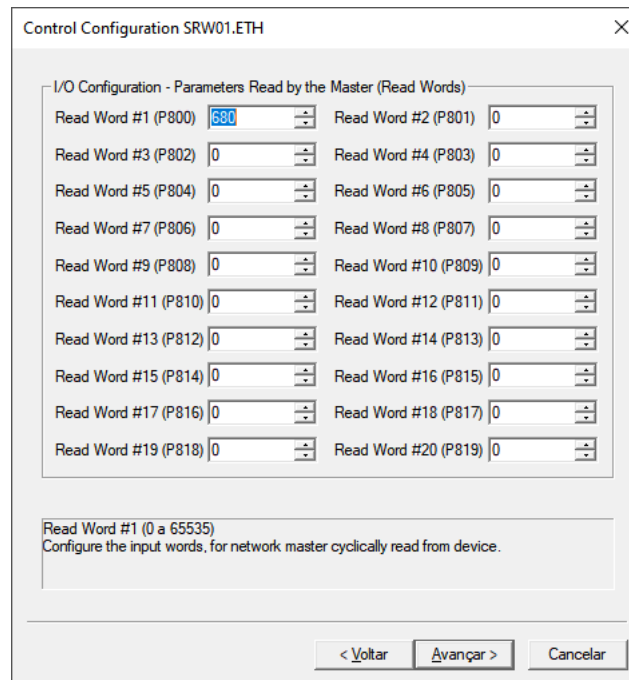
SRW01-ETH has a set of configurations where it is possible to define any device data to exchange with network master. For each application, it is necessary to consult the programming manual which describes the entire list of device data that can be programmed for I/O data and define the data to communicate with the master.

For this application, SRW01-ETH will exchange the following I/O data with network master:

Mapped Inputs	Size
P680 Status Word	16-bit (2 bytes)
TOTAL	1 Word (2 bytes)

Mapped Outputs	Size
P682 Control Word	16-bit (2 bytes)
TOTAL	1 Word (2 bytes)

Data read configuration (Input Words):



Control Configuration SRW01.ETH

I/O Configuration - Parameters Read by the Master (Read Words)

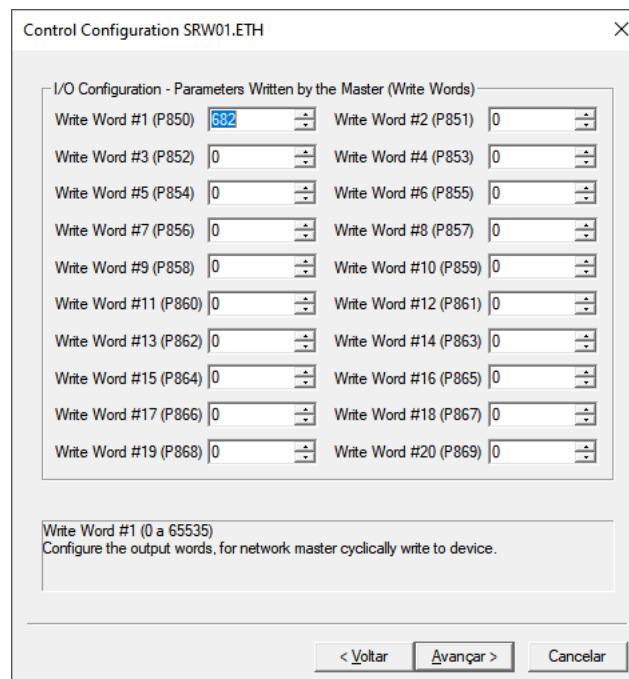
Read Word #1 (P800)	680	Read Word #2 (P801)	0
Read Word #3 (P802)	0	Read Word #4 (P803)	0
Read Word #5 (P804)	0	Read Word #6 (P805)	0
Read Word #7 (P806)	0	Read Word #8 (P807)	0
Read Word #9 (P808)	0	Read Word #10 (P809)	0
Read Word #11 (P810)	0	Read Word #12 (P811)	0
Read Word #13 (P812)	0	Read Word #14 (P813)	0
Read Word #15 (P814)	0	Read Word #16 (P815)	0
Read Word #17 (P816)	0	Read Word #18 (P817)	0
Read Word #19 (P818)	0	Read Word #20 (P819)	0

Read Word #1 (0 a 65535)
Configure the input words, for network master cyclically read from device.

< Voltar Avançar > Cancelar

Figure 3.3: SRW01-ETH - Data read configuration

Data write configuration (Output Words):



Control Configuration SRW01.ETH

I/O Configuration - Parameters Written by the Master (Write Words)

Write Word #1 (P850)	682	Write Word #2 (P851)	0
Write Word #3 (P852)	0	Write Word #4 (P853)	0
Write Word #5 (P854)	0	Write Word #6 (P855)	0
Write Word #7 (P856)	0	Write Word #8 (P857)	0
Write Word #9 (P858)	0	Write Word #10 (P859)	0
Write Word #11 (P860)	0	Write Word #12 (P861)	0
Write Word #13 (P862)	0	Write Word #14 (P863)	0
Write Word #15 (P864)	0	Write Word #16 (P865)	0
Write Word #17 (P866)	0	Write Word #18 (P867)	0
Write Word #19 (P868)	0	Write Word #20 (P869)	0

Write Word #1 (0 a 65535)
Configure the output words, for network master cyclically write to device.

< Voltar Avançar > Cancelar

Figure 3.4: SRW01-ETH - Data write configuration

3.3 SSW900

The configuration can be done via keypad or USB using the WPS software.

3.3.1 Ethernet Interface

- C8.3.4 IP Address Config: **0** (Parameters).
- C8.3.5 IP Address: 192.168.0.**12**.
- C8.3.6 CIDR: 255.255.255.0.
- C8.3.7 Gateway: 0.0.0.0.

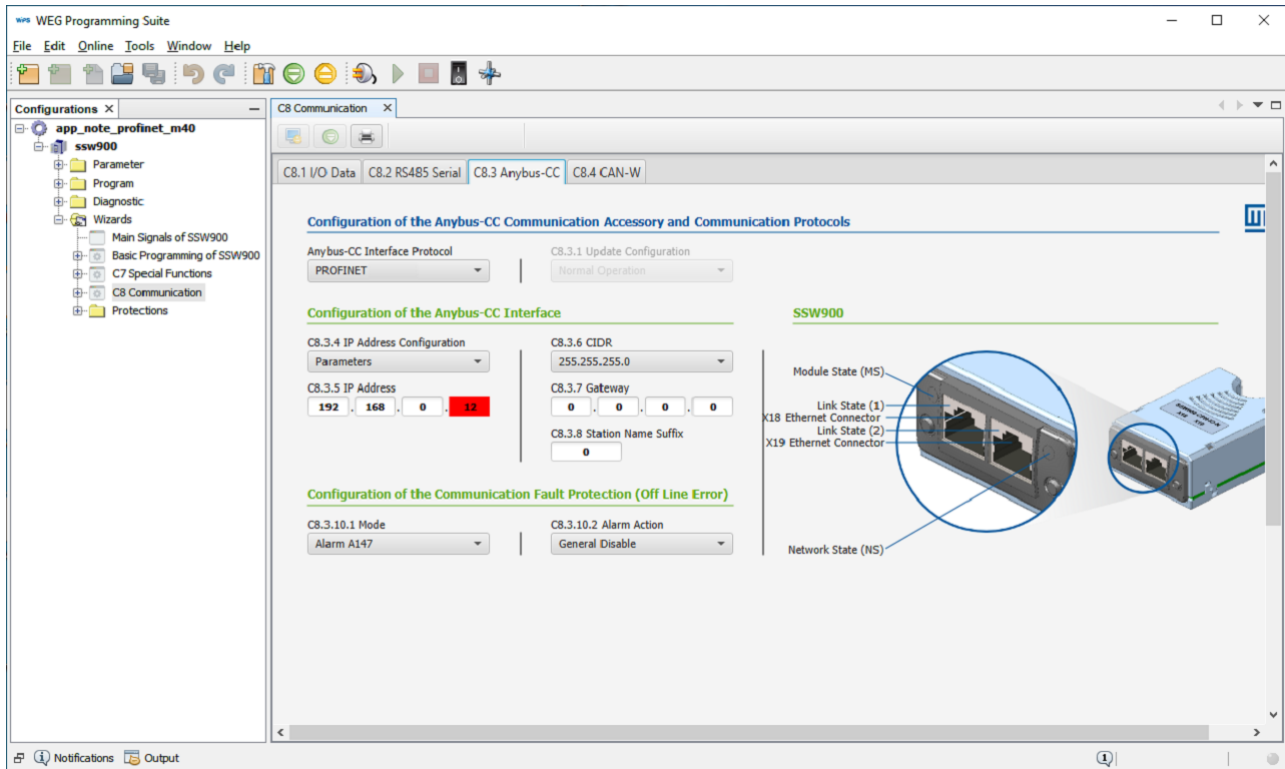


Figure 3.5: SSW900 - IP address configuration



NOTE!

After changing these configurations, for the modification to be effective, the equipment must be turned off and on again.

3.3.2 Local/Remote

SSW900 has two operation modes: local and remote. For each operation mode, it is necessary to define the source that it will use to receive commands, like start/stop, fault reset. For this application, considering PROFINET S2 accessory installed, the following control sources have been defined:

- Local: keypad will control SSW900 in local mode.
- Remote: PROFINET S2 will control SSW900 in remote mode.
- Local/Remote transition: the definition if the device is in local or remote mode will be controlled by PROFINET S2 commands (remote mode at power on).

Based on this, the following configurations have been programmed:

- C3.1 LOC/REM Selection Mode: **10** (Slot 1 REM).
- C3.2 LOC/REM Selection LOC Command: **0** (HMI Keys).
- C3.3 REM Command: **4** (Slot 1).

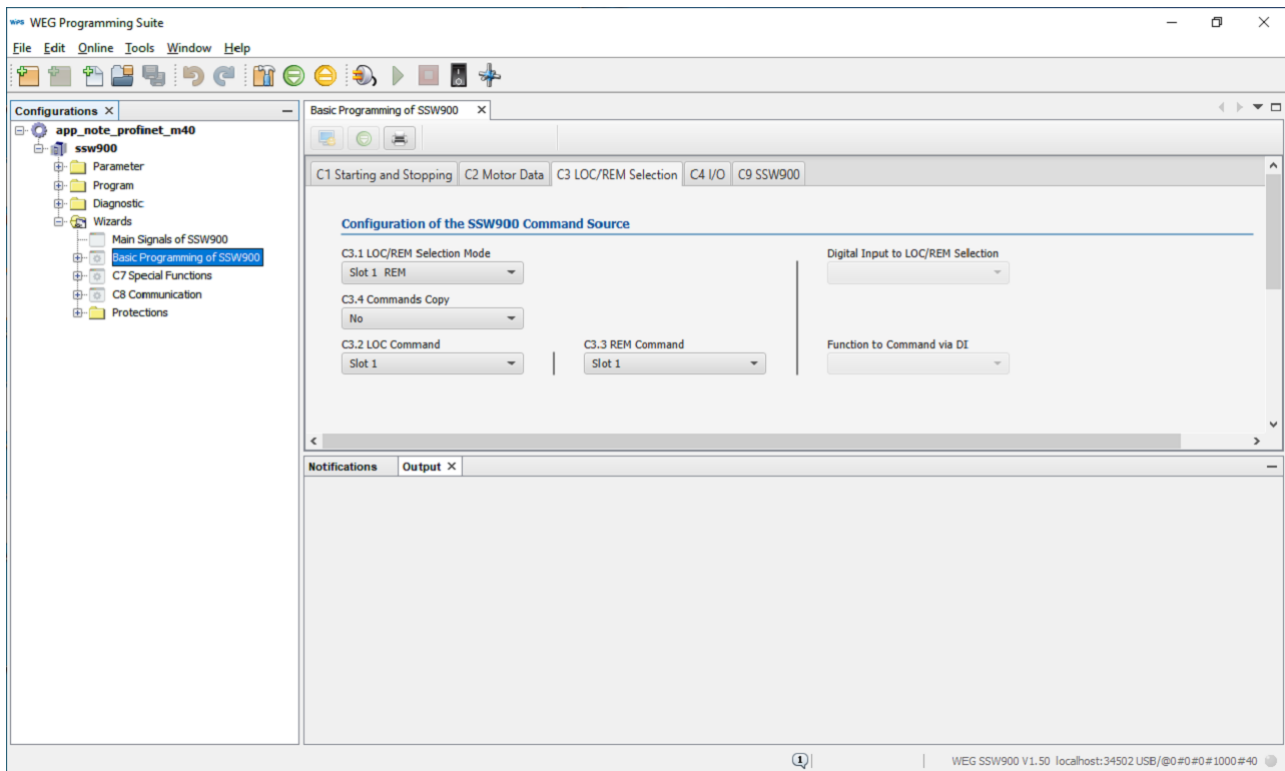


Figure 3.6: SSW900 -Local/Remote configuration

3.3.3 Communication Error

For SSW900, the following events lead to error indication:

- When cyclic communication is active and it is interrupted.
- When cyclic communication is active and master is in "Run" mode, and then it goes to "Idle" mode.

SSW900 will indicate A129 or F229 (Anybus Offline). It is important to define the action SSW900 will take in case of communication error. If SSW900 was running the motor via network command, SSW900 should also perform a general disable. Based on this, the following configurations have been programmed:

- C8.5.9.3 Action for Communic. Error: 2 (General Disable).

3.3.4 I/O Data Configuration

SSW900 has a set of configurations where it is possible to define any device data to exchange with network master. For each application, it is necessary to consult the programming manual which describes the entire list of device data that can be programmed for I/O data and define the data to communicate with the master.

Considering PROFINET S2 accessory installed at slot 1, for this application, SSW900 will exchange the following I/O data with network master:

Mapped Inputs	Size
S3.1.3.1 Status Word SSW	16-bit (2 bytes)
S1.2.4 Main Line Voltage Average	16-bit (2 bytes)
S1.1.4 Current Average	32-bit (4 bytes)
TOTAL	4 Words (8 bytes)

Mapped Outputs	Size
S5.2.5 Command Word Slot1	16-bit (2 bytes)
TOTAL	1 Word (2 bytes)

Data read configuration (Input Words):

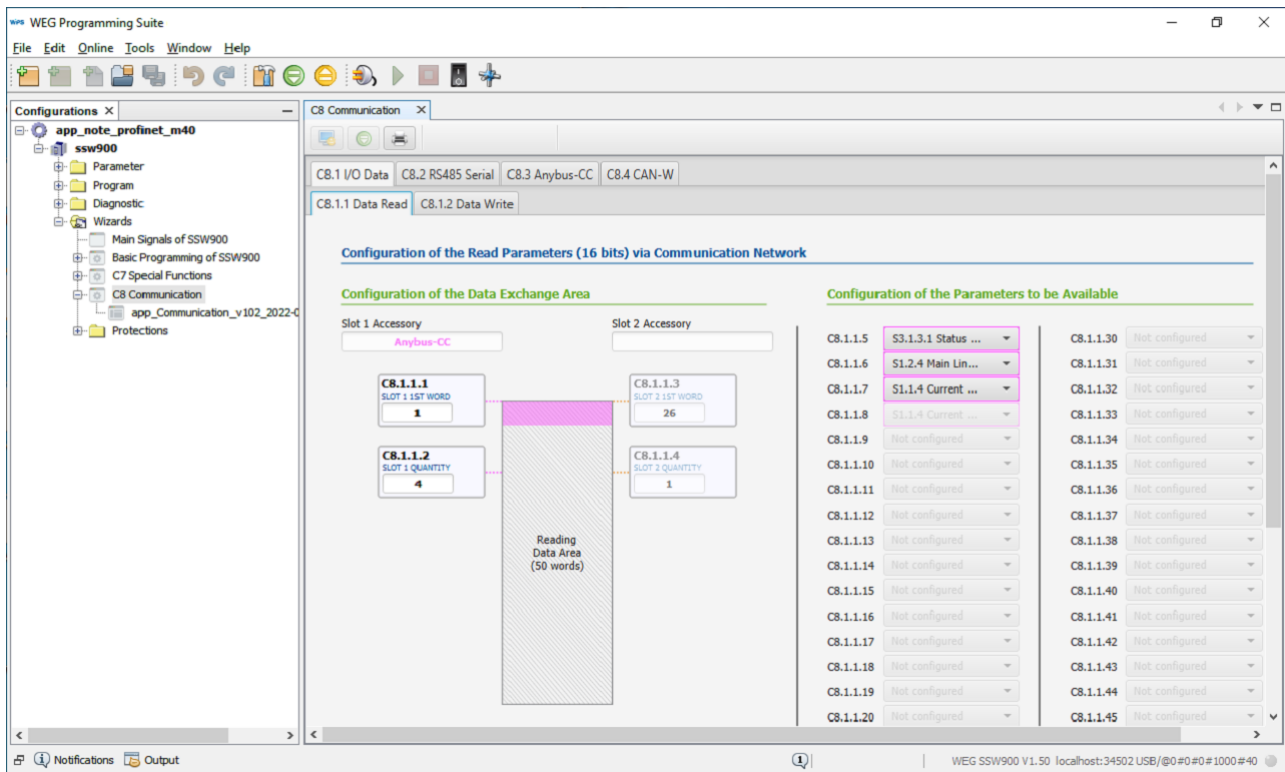


Figure 3.7: SSW900 - Data read configuration

Data write configuration (Output Words):

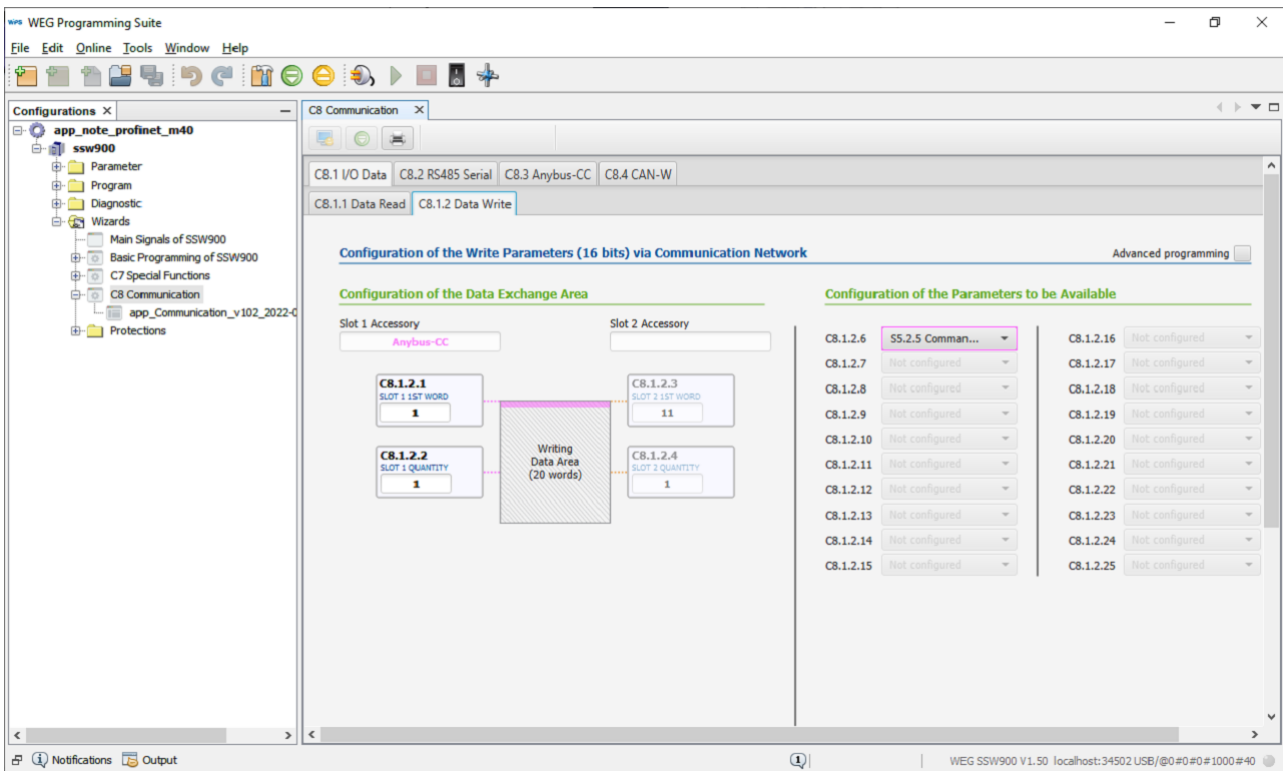


Figure 3.8: SSW900 - Data write configuration

4 MASTER CONFIGURATION - SIMATIC S7-1500

Use TIA Portal software to configure and program Simatic S7-1500 to communicate with CFW11, SRW01-ETH and SSW900. The main steps are described below.

Open TIA Portal software and create a new project.

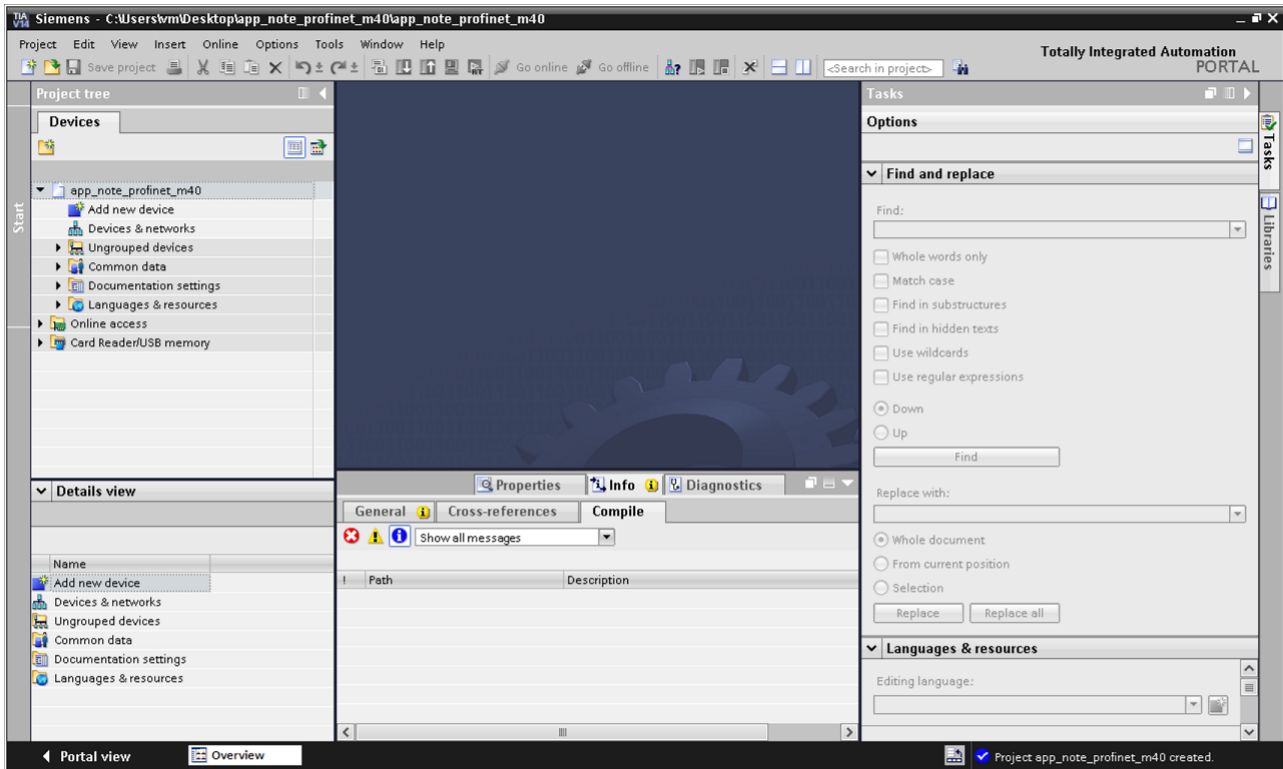


Figure 4.1: TIA Portal - Create new project

4.1 REGISTER GSDML FILE

Register GSDML files for CFW11, SRW01-ETH and SSW900.

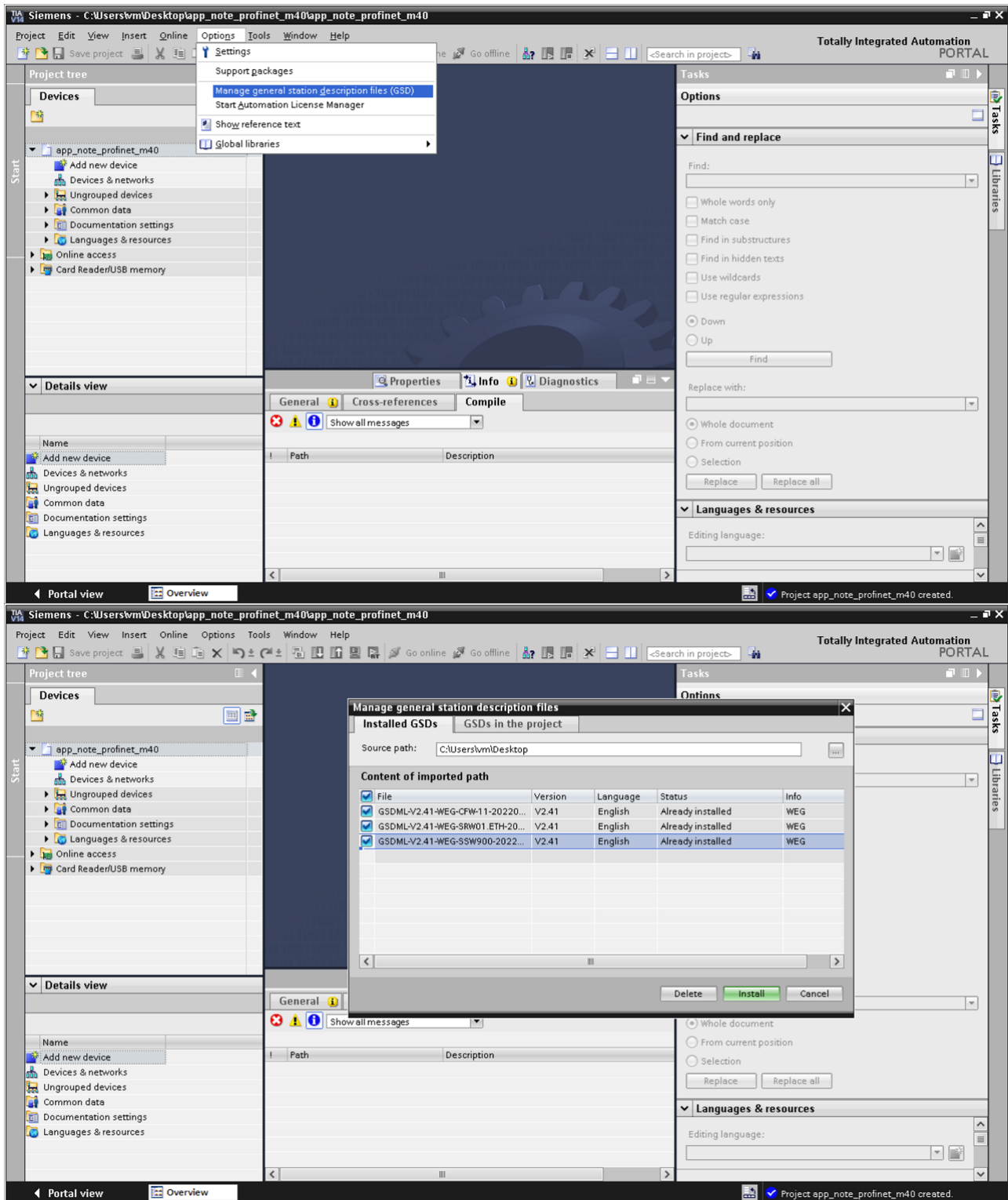


Figure 4.2: TIA Portal - Register GSDML File

4.2 ADD NEW DEVICE FOR SIMATIC S7-1500

Create a new device Simatic for PROFINET S2 interface and configure, as programmed at Chapter 2. When adding a device, pay attention to the firmware version you are using.

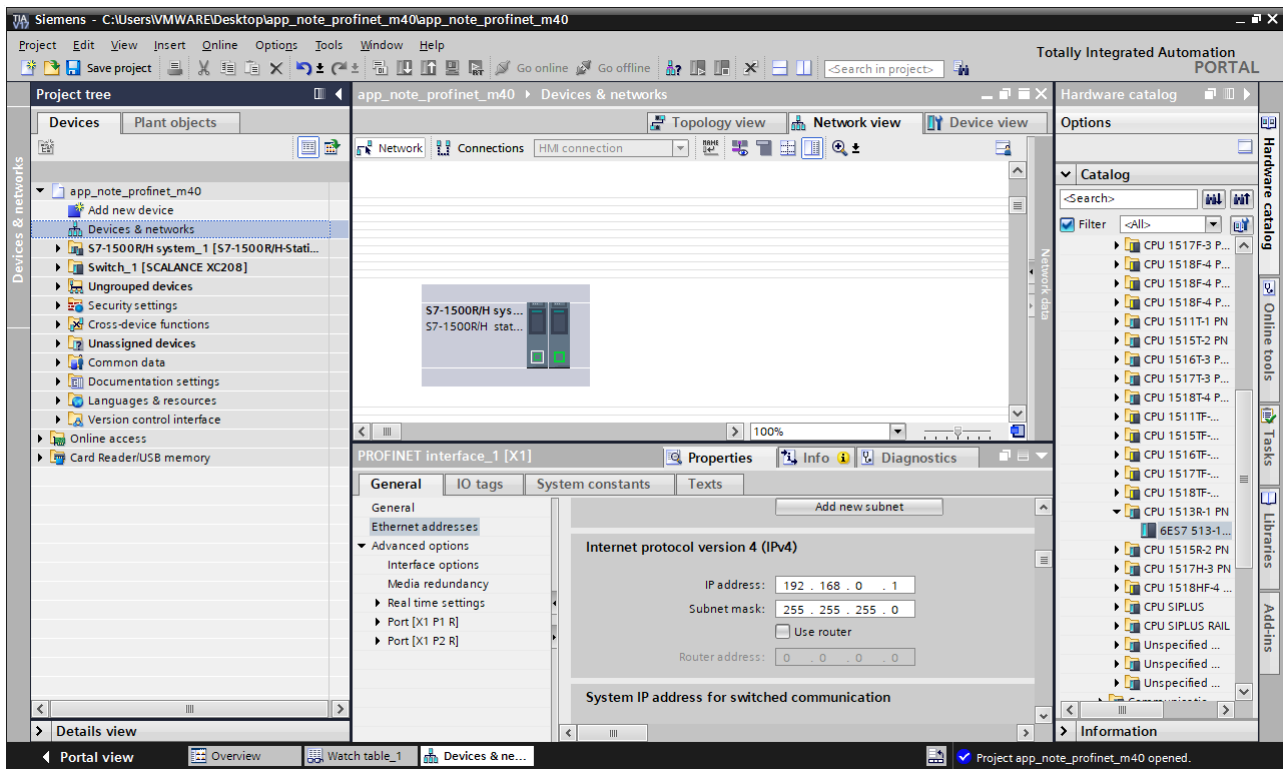


Figure 4.3: TIA portal - Add new Simatic S7-1500 device

- IP Address CPU 1: 192.168.0.1.
- IP Address CPU 2: 192.168.0.2.

4.3 ADD NEW DEVICE FOR SWITCH SCALANCE XC208

Create a new Scalance device for PROFINET S2 interface and configure, as programmed at Chapter 2.

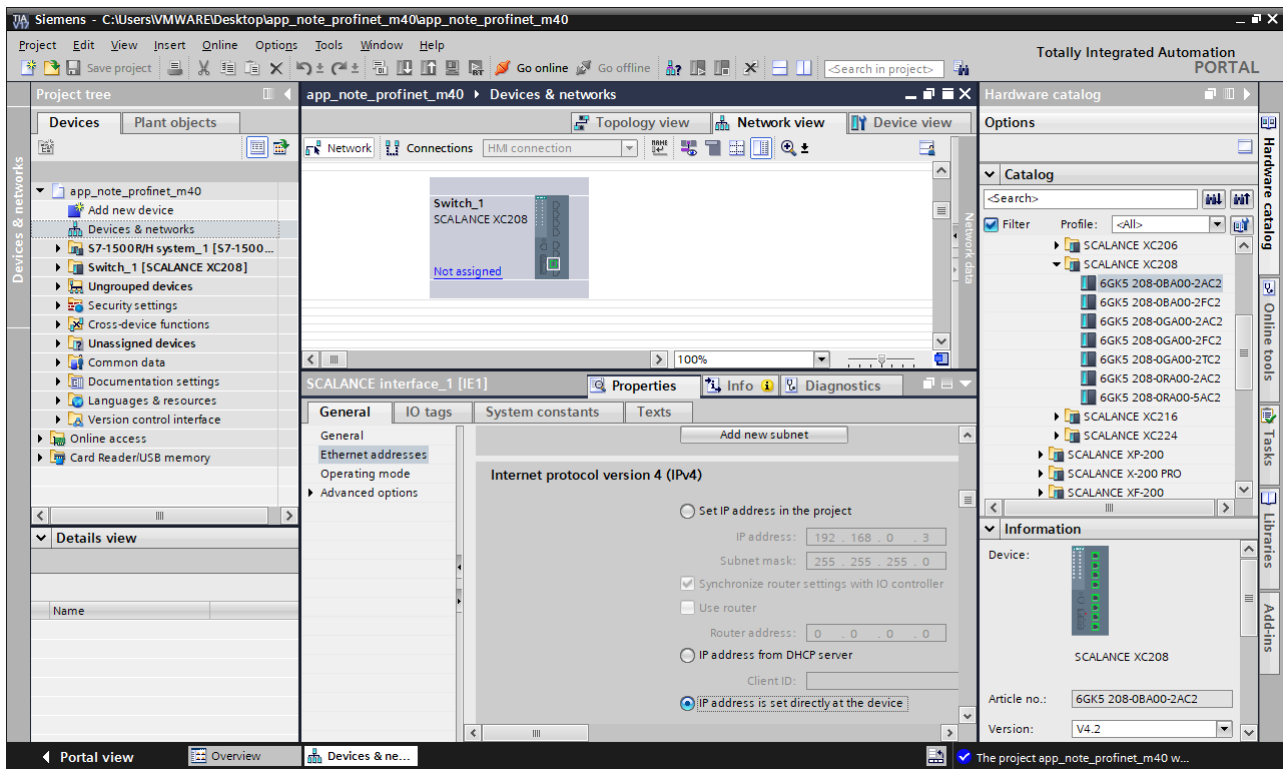


Figure 4.4: TIA portal - Add new Switch Scalance XC208 device

4.4 ADD NEW DEVICE FOR CFW11

Create a new CFW11 device for PROFINET S2 interface and configure, as programmed in Chapter 2. The input and output words must be assigned, as programmed in Item 3.1.4.

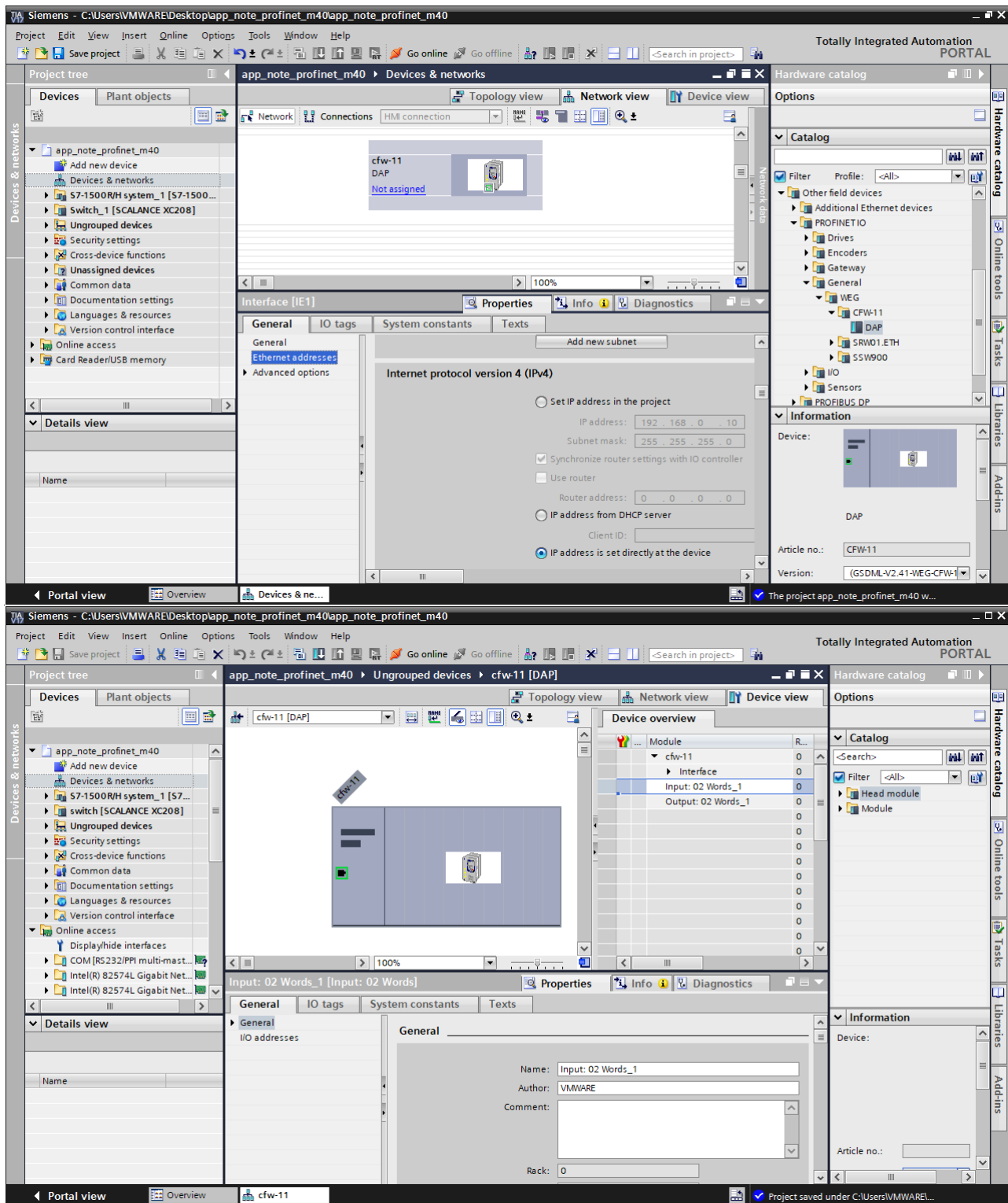


Figure 4.5: TIA portal - Add new CFW11 device

For this example, CFW11 will communicate 2 input words and 2 output words. Status and control data will follow the manufacturer specific profile. This configuration must match drive settings.

4.5 ADD NEW DEVICE FOR SRW01-ETH

Create a new SRW01-ETH device for PROFINET S2 interface and configure, as programmed in Chapter 2. The input and output words must be assigned, as programmed in Item 3.2.4.

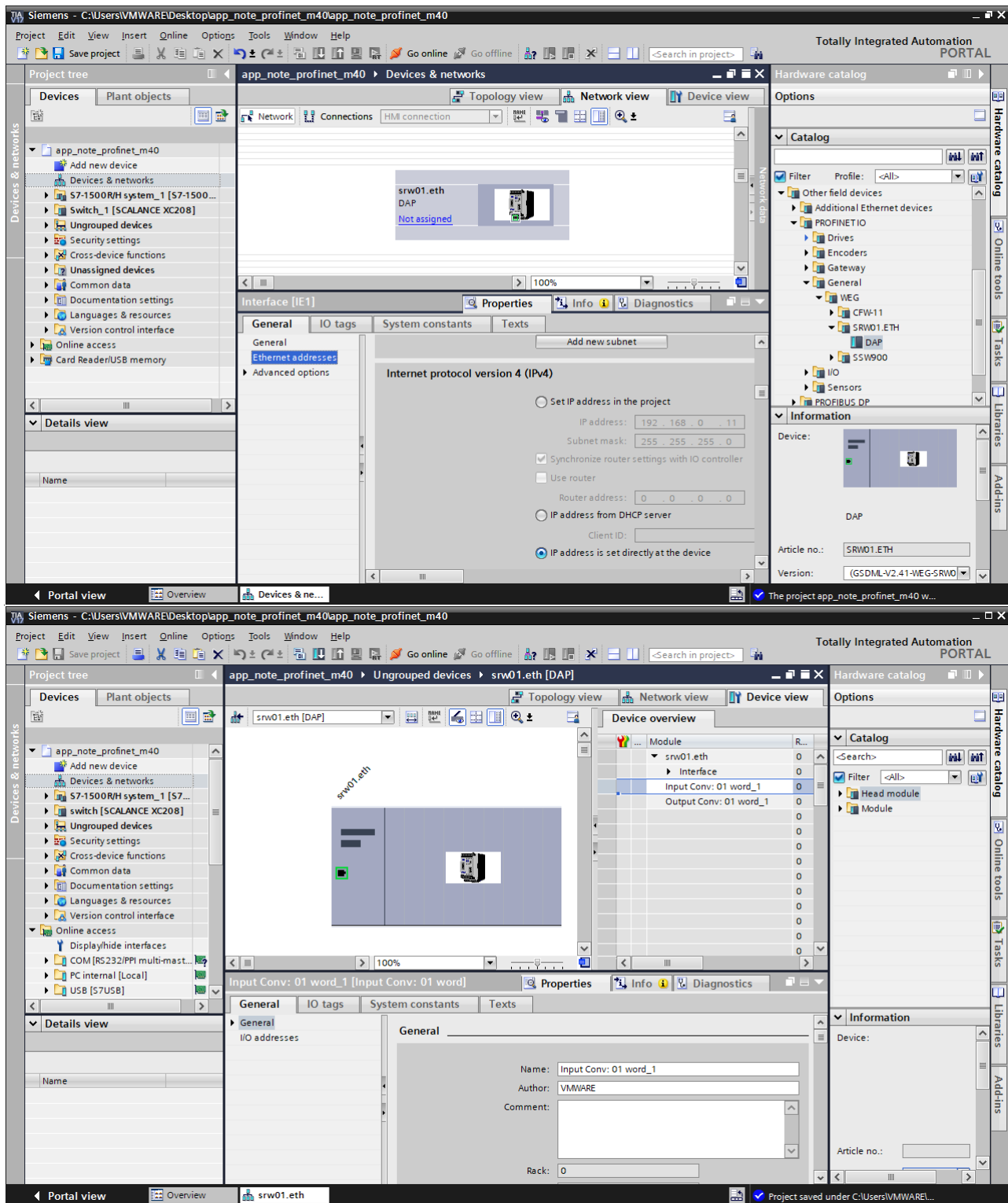


Figure 4.6: TIA portal - Add new SRW01-ETH device

For this example, SRW01-ETH will communicate 1 input word and 1 output word. Status and control data will follow the manufacturer specific profile. This configuration must match smart relay settings.

4.6 ADD NEW DEVICE FOR SSW900

Create a new SSW900 device for PROFINET S2 interface and configure, as programmed in Chapter 2. The input and output words must be assigned, as programmed in Item 3.3.4.

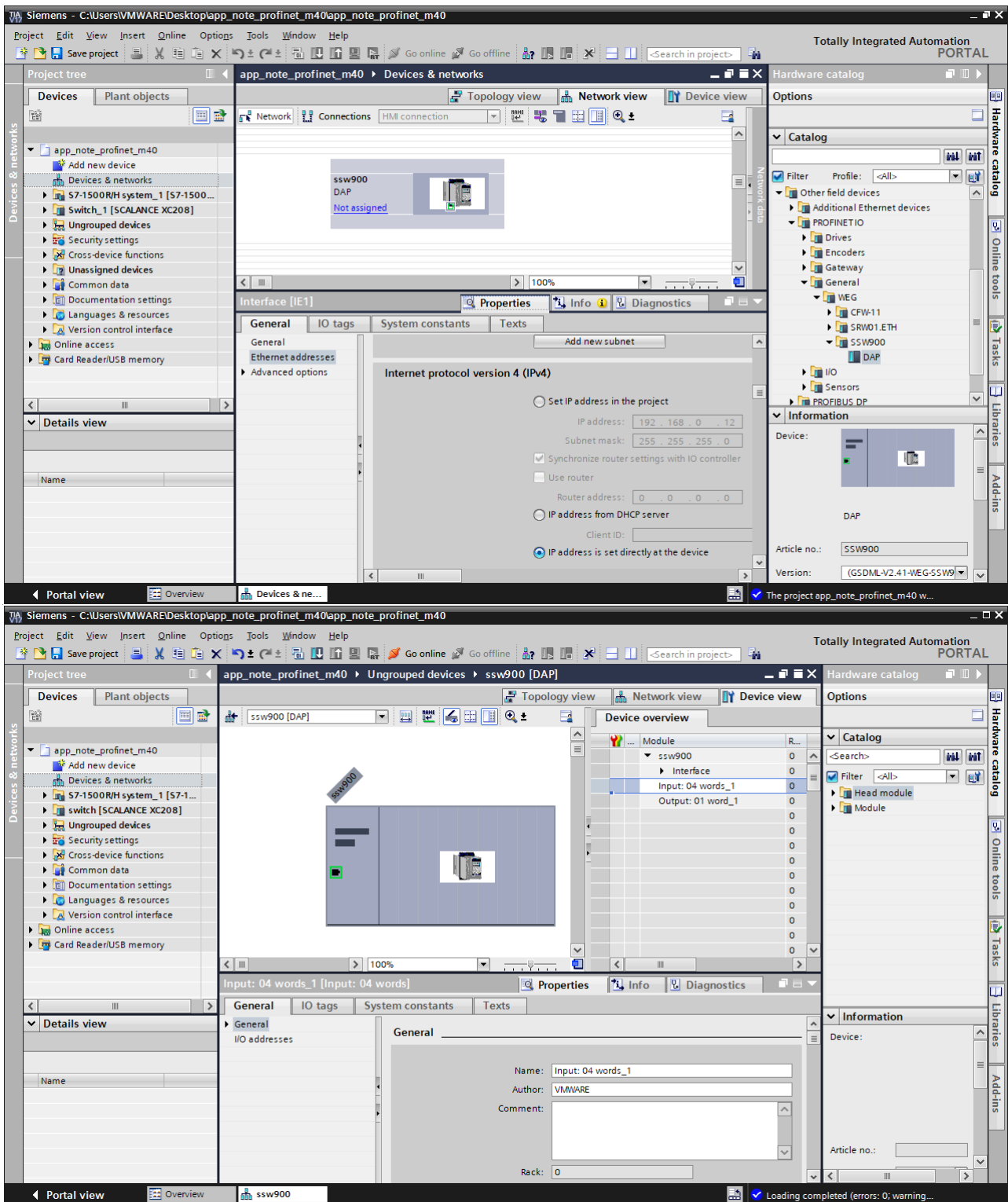


Figure 4.7: TIA portal - Add new SSW900 device

For this example, SSW900 will communicate 4 input words and 1 output word. Status and control data will follow the manufacturer specific profile. This configuration must match soft-starter settings.

5 NETWORK CONFIGURATION

After configuring the slaves and the master, it is necessary to make the connections between devices in the TIA Portal software. As shown in the Section 1.2, two network topologies will be used to illustrate the equipment communication.

5.1 LINE TOPOLOGY

In this network configuration, the CPUs and switch are in a ring topology and the other devices are in a line topology, as shown in Item 1.2.1. In order to have S2 redundancy, both CPUs must be in a ring with MRP (Media Redundancy Protocol) enabled. This same setting is used for ring topology as well, as shown in Section 5.2.

In Network View, make the connection between both devices and check if the connection is "Multi assigned" and in Topology View, configure according to the physical connection made.



NOTE!

The two ports used on the switch must be configured for MRP.

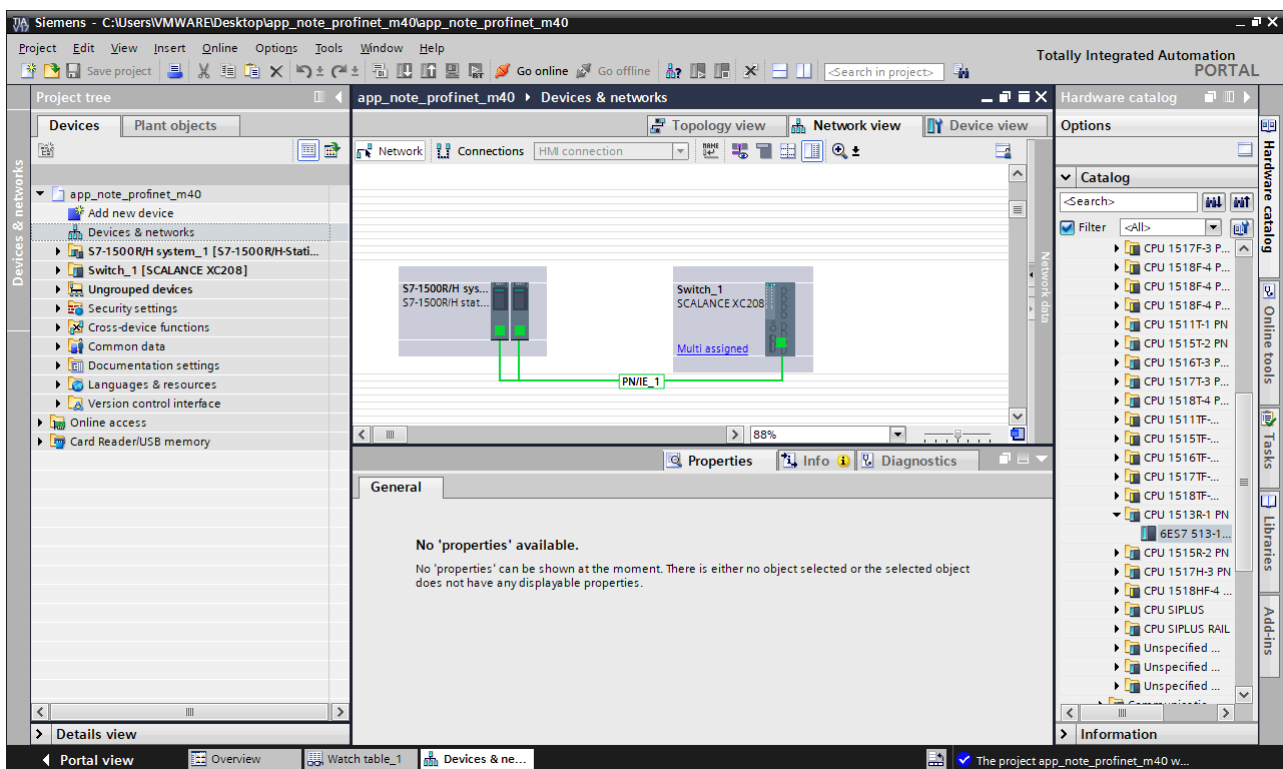


Figure 5.1: Network View - Simatic S7-1500 and Scalance XC208

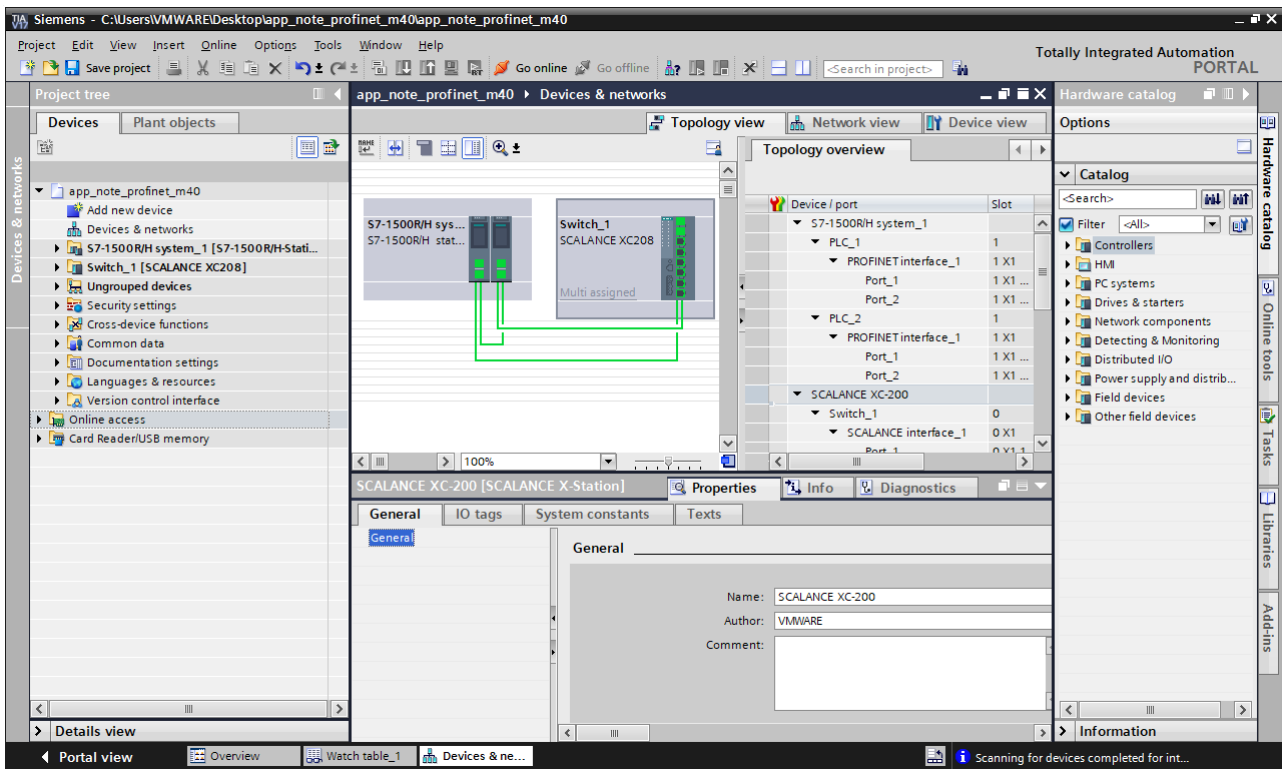


Figure 5.2: Topology View - Simatic S7-1500 and Scalance XC208

After making the connections, we will configure the MRP. To do so, we must define the MRP manager and clients. For this application, the Simatic S7-1500 is set as the manager and the Scalance XC208 is the client.

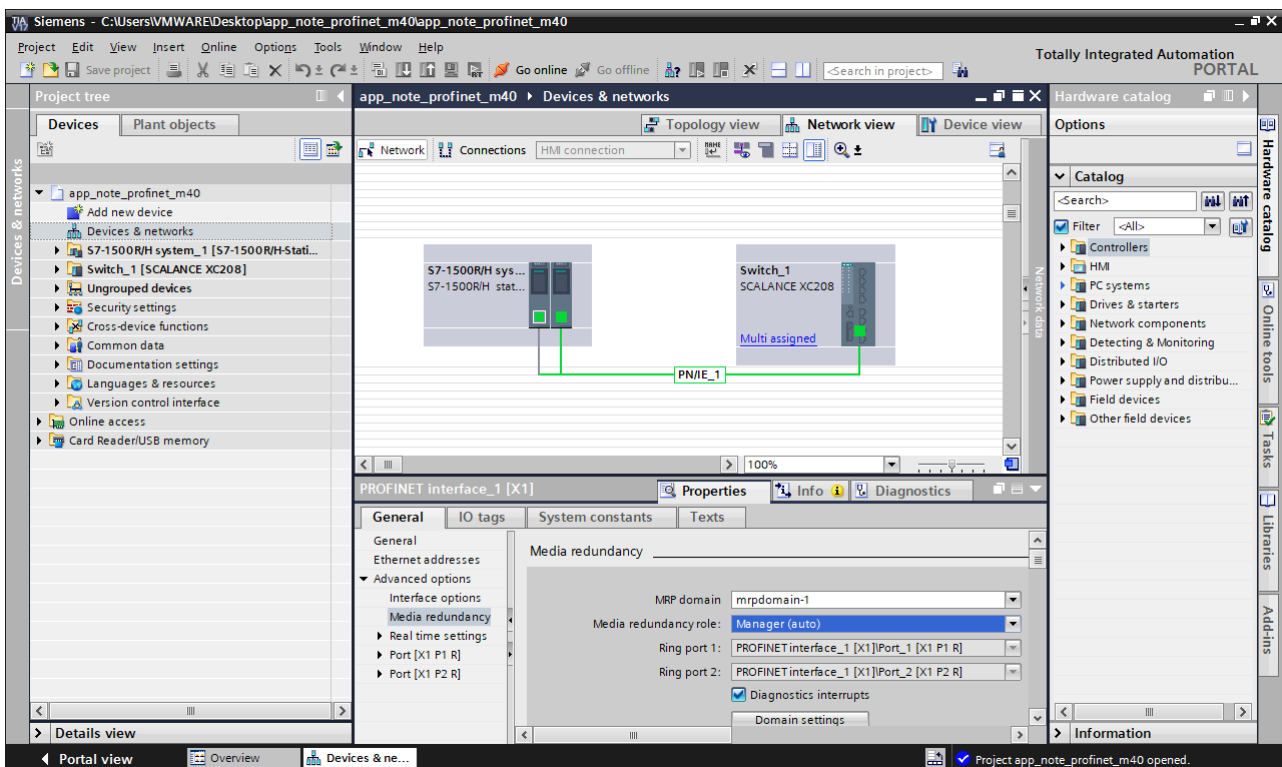


Figure 5.3: Simatic S7-1500 MRP Configuration

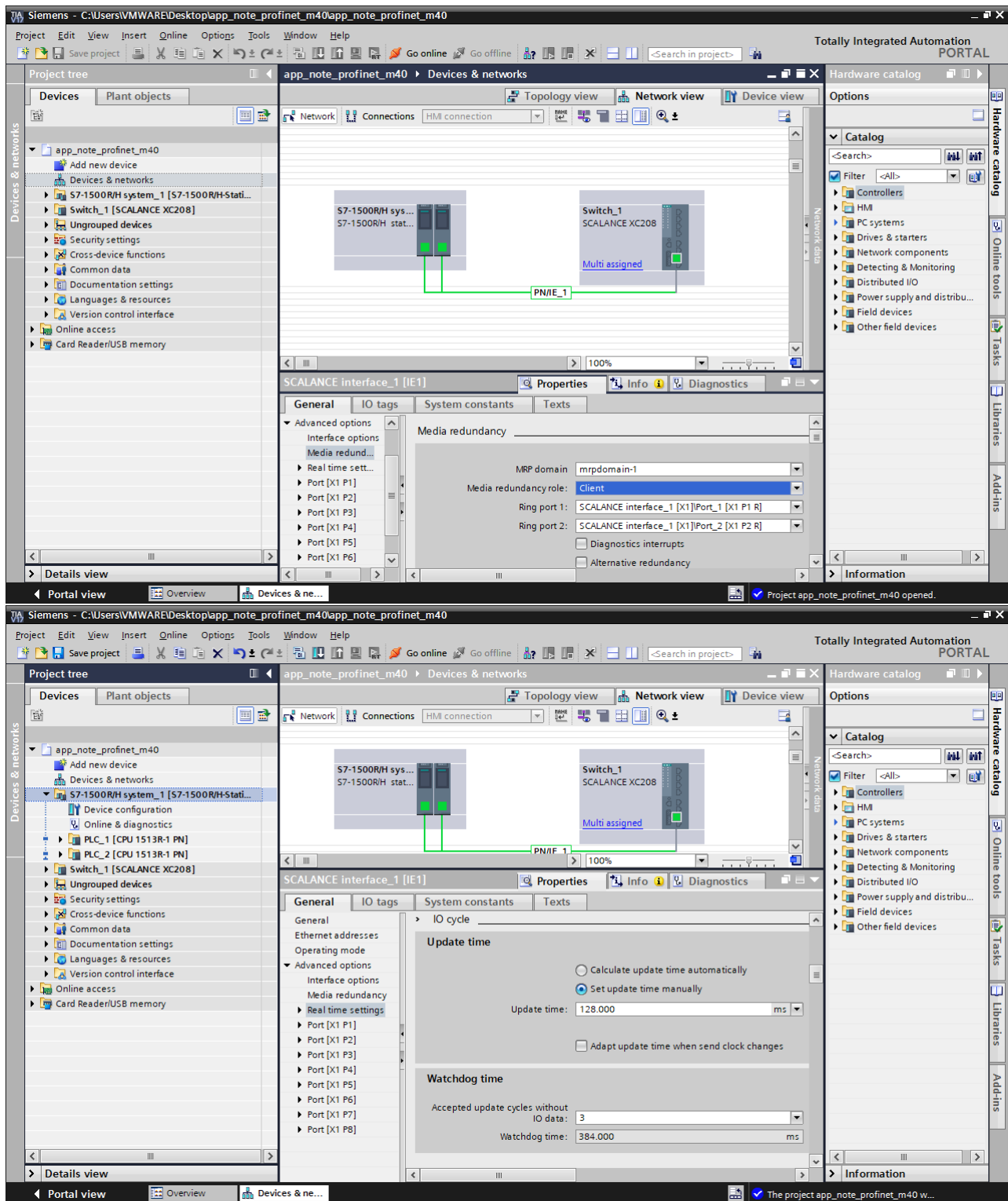


Figure 5.4: Scalance XC208 MRP Configuration



NOTE!

The Watchdog time must be greater than 200 ms.

After configuring the MRP, make the connections of the other devices in Network View and Topology View.

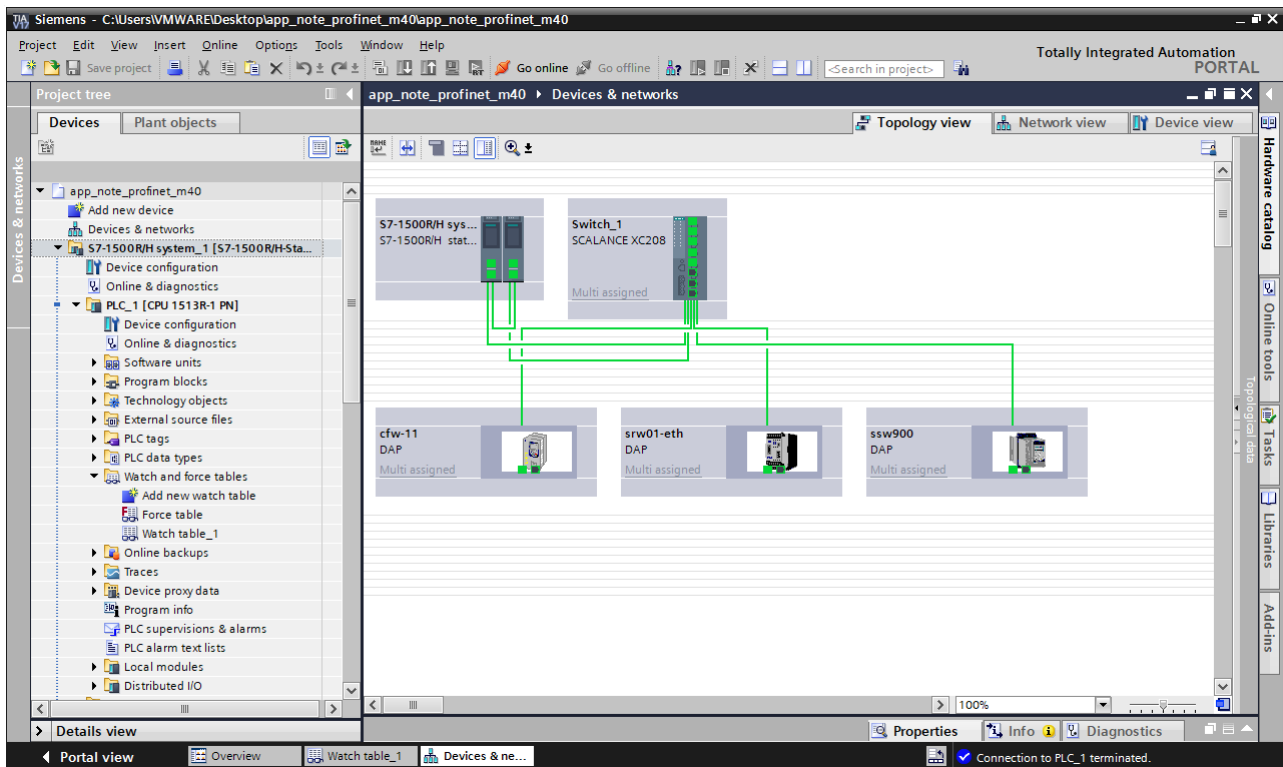


Figure 5.5: Topology View - Line

On top of that, you need to configure the update time and watchdog time for each device as shown below.

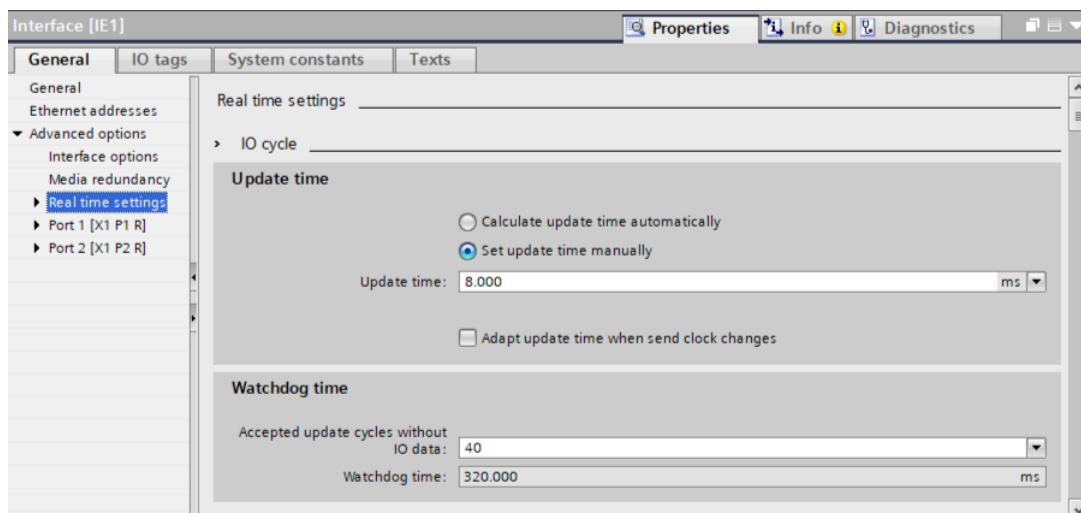


Figure 5.6: MRP Configuration for CFW11, SRW01-ETH and SSW900

Once the settings are done, compile and download according to the Chapter 6.

5.2 RING TOPOLOGY

In this network configuration, all devices are in a ring topology, as shown in 1.2.2.

In Network View, make the connection between all devices and check if the connection is "Multi assigned" and in Topology View, configure according to the physical connection made.



NOTE!

Both ports in the switch must be configured for MRP.

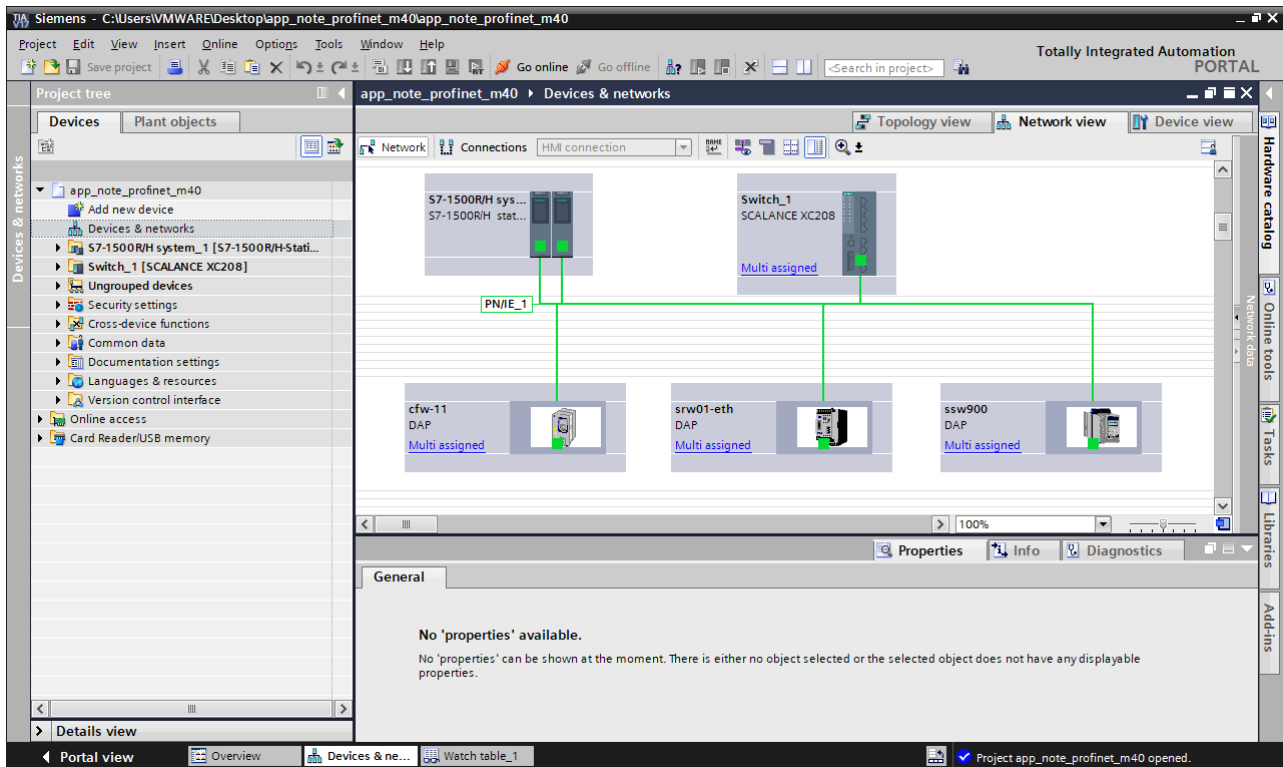


Figure 5.7: Network View - All devices

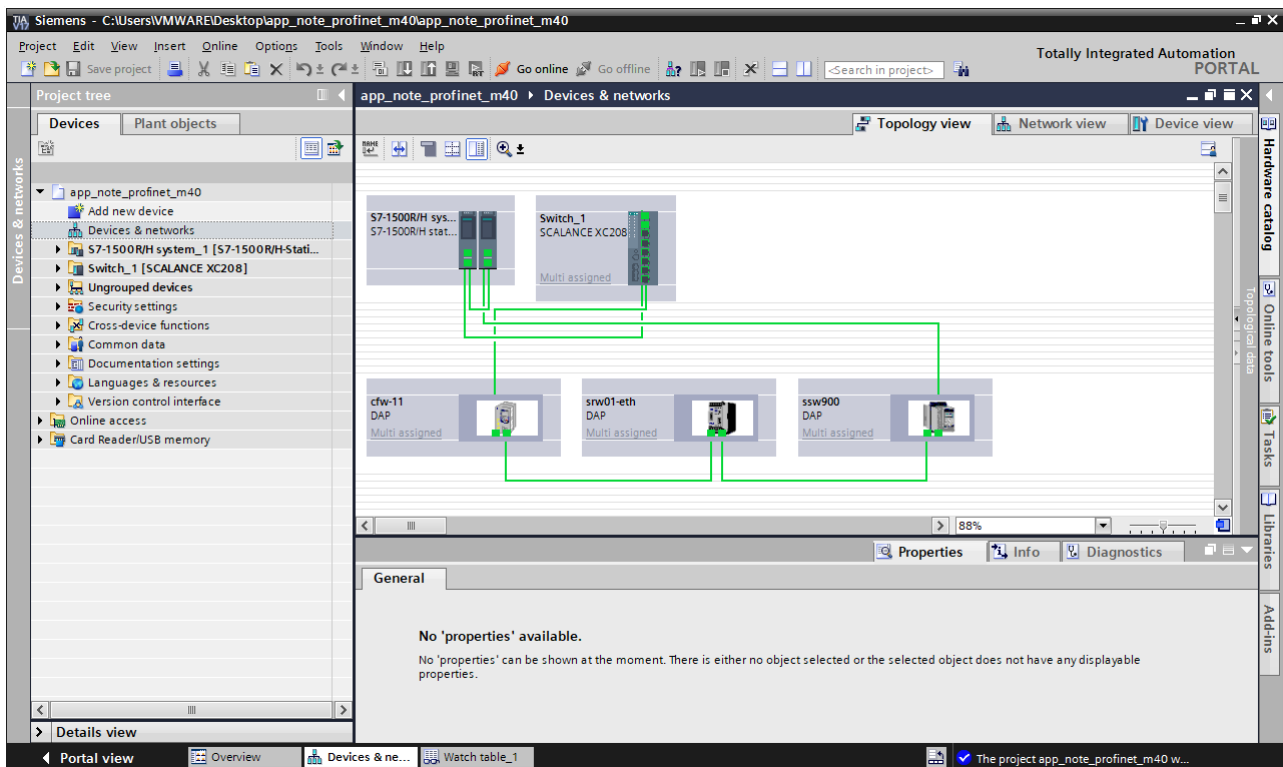


Figure 5.8: Topology View - Ring

After making the connections, we will configure the MRP. Again, we must define the MRP manager and clients. For

this application, the Simatic S7-1500 is set as the manager and the Scalance XC208, CFW11, SRW01-ETH and SSW900 are the clients.

The MRP configuration for the Simatic S7-1500 and Scalance XC208 is illustrated, respectively, in Figure 5.3 and Figure 5.4.

For the CFW11, SRW01-ETH and SSW900, configure the MRP according to Figure 5.6.

Once the settings are done, compile and download according to the Chapter 6.

6 DOWNLOAD AND MONITOR CONFIGURATION

With devices configured, data for each device must be available in memory addresses. Using these addresses, it is possible to view and edit the devices I/O data online, as well as creating tags based on these memory addresses and creating ladder logic to control and monitor the device.

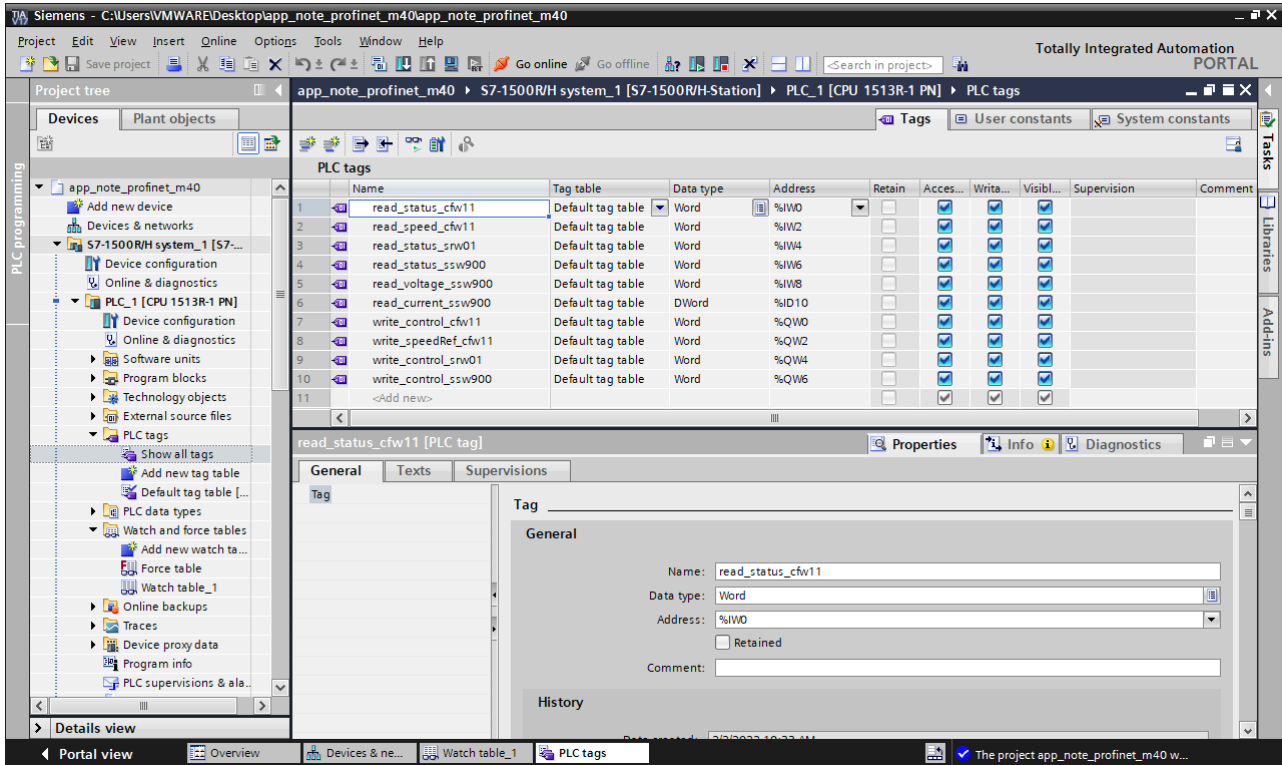


Figure 6.1: TIA portal - Create tags for cyclic data

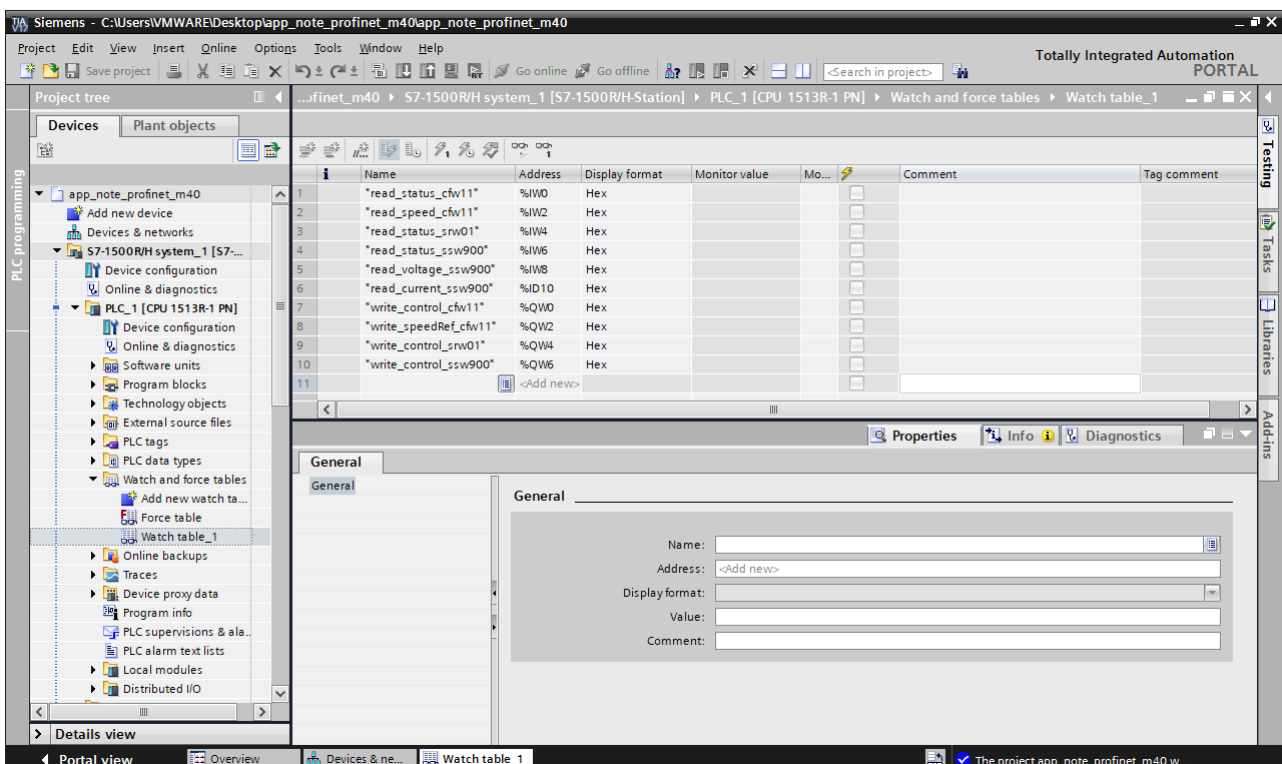


Figure 6.2: TIA portal - Add new Watch Table

Once the configuration is finished, download it to the primary PLC and backup PLC to monitor the I/O data of the devices.

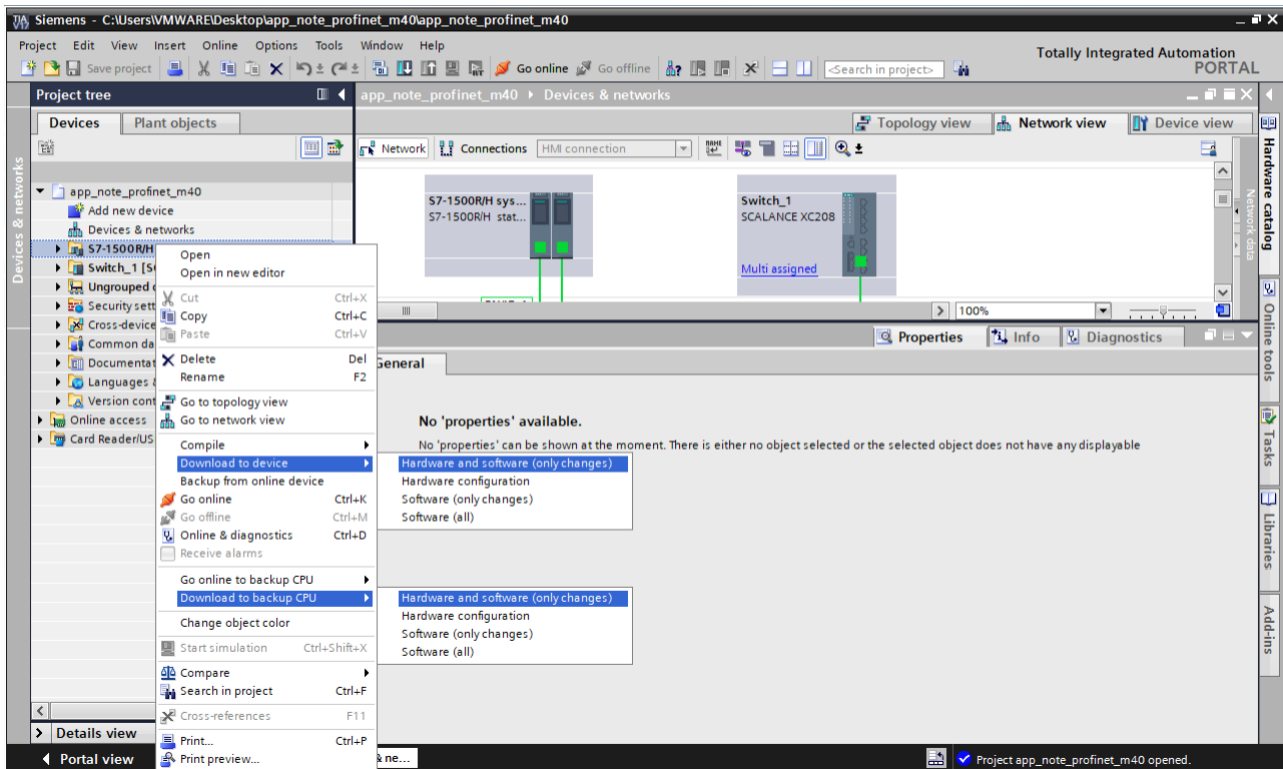


Figure 6.3: TIA Portal - Download



NOTE!

After downloading, it is necessary to put both CPUs in STOP and then RUN or restart them.

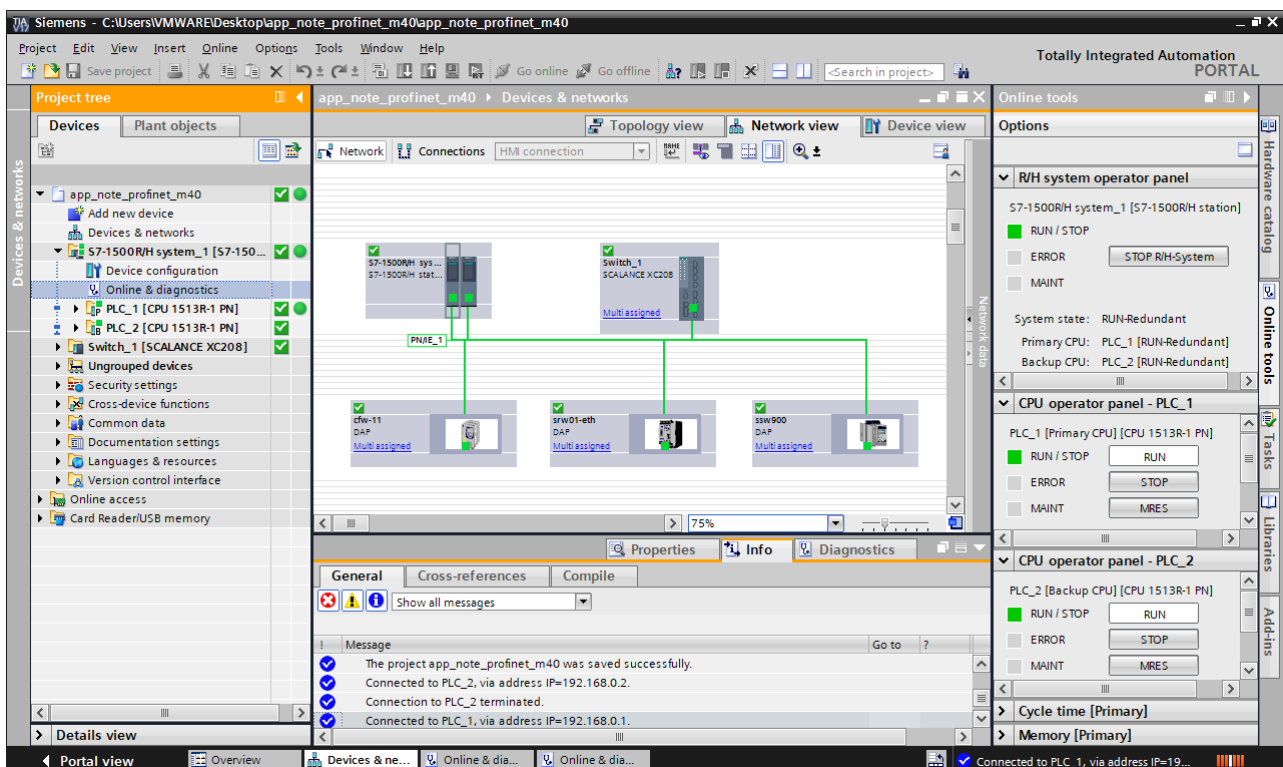


Figure 6.4: TIA Portal - Online

7 CONTROL AND MONITORING

Once network configuration is done, it is possible to control and monitor the device. The main steps are described below.

7.1 VIEW AND EDIT READ AND WRITE DATA

In online mode, in the watch table, it is possible to check input and write output data directly at controller memory.

7.1.1 View and Edit Data - CFW11

Parameter	Function	Adjustable Range	Factory Setting	User Setting	Properties	Groups	Pag.
P0680	Logical Status	Bit 0 to 3 = Not Used Bit 4 = Quick Stop ON Bit 5 = 2nd Ramp Bit 6 = Config. Mode Bit 7 = Alarm Bit 8 = Running Bit 9 = Enabled Bit 10 = Forward Bit 11 = JOG Bit 12 = Remote Bit 13 = Subvoltage Bit 14 = Automatic(PID) Bit 15 = Fault	-		RO	09, 111	17-5

Figure 7.1: Read data, with highlight to the status word as described at CFW11 PROFINET S2 documentation

For inputs, as described at Item 3.1.4, it is programmed to read the following information:

- read_cfw11_status[%IW0]: P680, value 0x1700 hexadecimal (binary 0001 0111 0000 0010).
 - Bit 8 = 1 (running).
 - Bit 9 = 1 (enabled).
 - Bit 10 = 1 (forward direction).
 - Bit 12 = 1 (at remote mode).
- read_speed_cfw11[%IW2]: P681, value 0x1000 ($\approx 1/2$ motor nominal speed).

Parameter	Function	Adjustable Range	Factory Setting	User Setting	Properties	Groups	Pag.
P0682	Anybus-CC Control	Bit 0 = Ramp Enable Bit 1 = General Enable Bit 2 = Run Forward Bit 3 = JOG Enable Bit 4 = Remote Bit 5 = 2nd Ramp Bit 6 = Reserved Bit 7 = Fault Reset Bit 8 to 15 = Reserved	-		RO	09, 111	17-1

Figure 7.2: Write data, with highlight to the control word as described at CFW11 PROFINET S2 documentation

For outputs, as described at Item 3.1.4, it is programmed to write the following information:

- write_control_cfw11[%QW0]: P686, value 0x17 hexadecimal (binary 0000 0000 0001 0111).
 - Bit 0 = 1 (ramp enable).
 - Bit 1 = 1 (general enable).
 - Bit 2 = 1 (run forward).
 - Bit 4 = 1 (remote).
- write_speedRef_cfw11[%QW2]: P687, value 0x1000 ($\approx 1/2$ motor nominal speed)

These tags can be used during PLC program to create a logic in order to monitor and control devices.

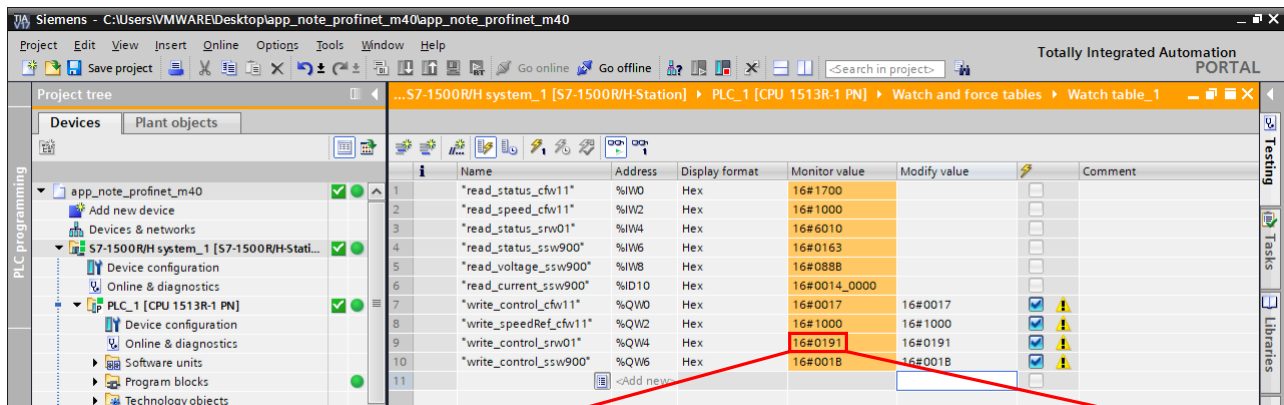
7.1.2 View and Edit Data - SRW01-ETH

Bit	Value/Description
Bit 0 Error	0: the relay is not in error condition. 1: the relay is in error condition. Note: The error number can be read via the parameter P0016 – Current Error.
Bit 1 Trip	0: the relay is not in the trip condition. 1: the relay is in the trip condition. Note: The trip fault number can be read via the parameter P0016 – Current Error.
Bit 2 Alarm/Fault	0: the relay is not in the alarm/fault condition. 1: the relay is in the alarm/fault condition. Note: The alarm/fault number can be read via the parameter P0016 – Current Error.
Bit 3 Motor On	0: motor Off. 1: Motor On.
Bit 4 Remote Mode	0: the relay is in local mode. 1: the relay is in remote mode.
Bit 5 Digital Input I11 Status	0: I11 digital input is deactivated. 1: I11 digital input is activated.
Bit 6 Digital Input I12 Status	0: I12 digital input is deactivated. 1: I12 digital input is activated.
Bit 7 Digital Input I13 Status	0: I13 digital input is deactivated. 1: I13 digital input is activated.
Bit 8 Digital Input I14 Status	0: I14 digital input is deactivated. 1: I14 digital input is activated.
Bit 9 Digital Input I15 Status	0: I15 digital input is deactivated. 1: I15 digital input is activated.
Bit 10 Digital Input I16 Status	0: I16 digital input is deactivated. 1: I16 digital input is activated.
Bit 11 Digital Output O1 Status	0: O1 digital output is deactivated. 1: O1 digital output is activated.
Bit 12 Digital Output O2 Status	0: O2 digital output is deactivated. 1: O2 digital output is activated.
Bit 13 Digital Output O3 Status	0: O3 digital output is deactivated. 1: O3 digital output is activated.
Bit 14 Digital Output O4 Status	0: O4 digital output is deactivated. 1: O4 digital output is activated.
Bit 15	Reserved.

Figure 7.3: Read data, with highlight to the status word as described at SRW01-ETH PROFINET S2 documentation

For inputs, as described at Item 3.2.4, it is programmed to read the following information:

- read_status_srw01[%IW4]: P680, value 0x6010 hexadecimal (binary 0110 0000 0001 0000).
 - Bit 4 = 1 (remote mode).
 - Bit 13 = 1 (digital output 03 status).
 - Bit 14 = 1 (digital output 04 status).



Bit	Value/Description
Bit 0 Command 1*	Varies according to the chosen operation mode (P0202).
Bit 1 Command 2*	Varies according to the chosen operation mode (P0202).
Bit 2 Command 3*	Varies according to the chosen operation mode (P0202).
Bit 3 Reset	0 → 1: when faulted (trip), it executes the relay reset.
Bit 4 Remote**	0: changes to local mode. 1: changes to remote mode.
Bit 5 Digital Output O1 Value***	0: deactivates the O1 digital output. 1: activates the O1 digital output.
Bit 6 Digital Output O2 Value***	0: deactivates the O2 digital output. 1: activates the O2 digital output.
Bit 7 Digital Output O3 Value***	0: deactivates the O3 digital output. 1: activates the O3 digital output.
Bit 8 Digital Output O4 Value***	0: deactivates the O4 digital output. 1: activates the O4 digital output.
Bit 9 Digital Output O5 Value***	0: deactivates the O5 digital output. 1: activates the O5 digital output.
Bit 10 Digital Output O6 Value***	0: deactivates the O6 digital output. 1: activates the O6 digital output.
Bit 11 Digital Output O7 Value***	0: deactivates the O7 digital output. 1: activates the O7 digital output.
Bit 12 Digital Output O8 Value***	0: deactivates the O8 digital output. 1: activates the O8 digital output.
Bit 13...15	Reserved.

Figure 7.4: Write data, with highlight to the control word as described at SRW01-ETH PROFINET S2 documentation

For outputs, as described at Item 3.2.4, it is programmed to write the following information:

- write_control_srw01[%QW4]: P682, value 0x0191 hexadecimal (binary 0000 0001 1001 0001).
 - Bit 0 = 1 (command 1).
 - Bit 4 = 1 (remote).
 - Bit 7 = 1 (digital output O3 value).
 - Bit 8 = 1 (digital output O4 value).

These tags can be used during PLC program to create a logic in order to monitor and control devices.

7.1.3 View and Edit Data - SSW900

Parameter	Description	Range of values	Properties	Communication Address
S5.1	Status Word		16bit	680
S5.1.1	SSW	Bit 0 = Running Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = Initial Test Bit 4 = Ramp Up Bit 5 = Full Voltage Bit 6 = Bypass Bit 7 = Ramp Down Bit 8 = Remote Bit 9 = Braking Bit 10 = FWD/REV Bit 11 = Reverse Bit 12 = Ton Bit 13 = Toff Bit 14 = Alarm Bit 15 = Fault		

Figure 7.5: Read data, with highlight to the status word as described at SSW900 PROFINET S2 documentation

For inputs, as described at Item 3.3.4, it is programmed to read the following information:

- read_status_ssw900[%IW6]: P680, value 0x163 hexadecimal (binary 0000 0001 0110 0011).
 - Bit 0 = 1 (running).
 - Bit 1 = 1 (general enabled).
 - Bit 5 = 1 (full voltage).
 - Bit 6 = 1 (bypass).
 - Bit 8 = 1 (remote mode).
- read_voltage_ssw900[%IW8]: P004, value 0x88B (main line voltage average = 218.7V).
- read_current_ssw900[%ID10]: P024, value 0x0014_0000 (current average - high word / low word).



NOTE!

To read the current value, swap the high word and the low word (current value 2.0A).

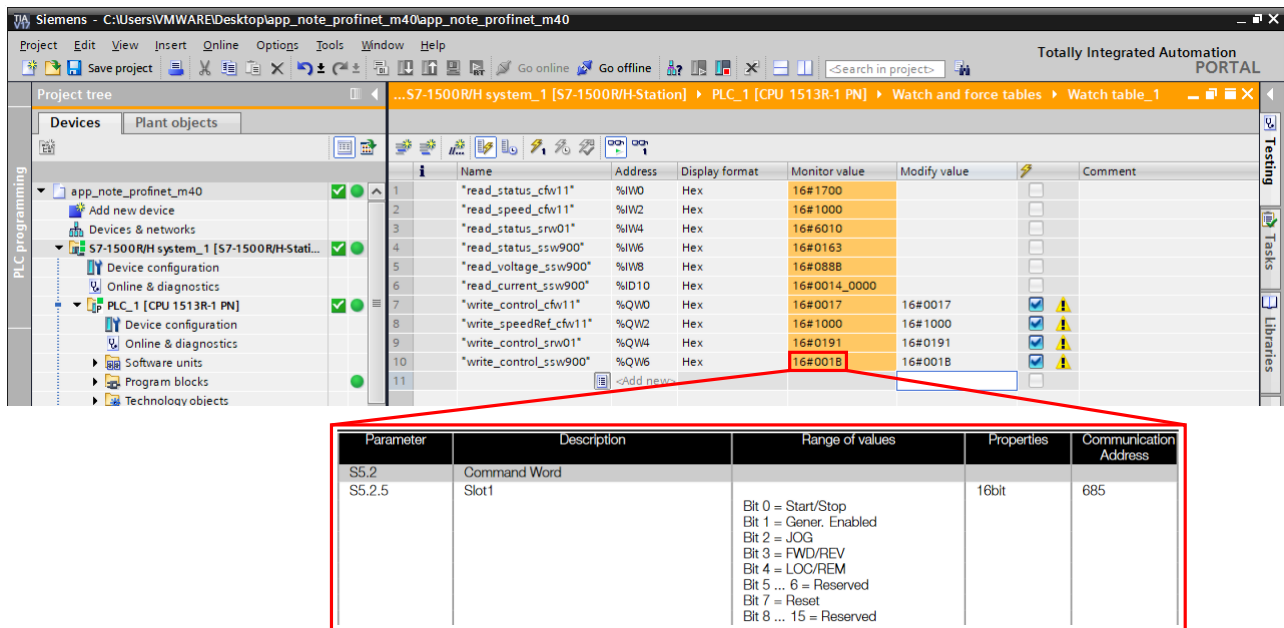


Figure 7.6: Write data, with highlight to the control word as described at SSW900 PROFINET S2 documentation

For outputs, as described at Item 3.3.4, it is programmed to write the following information:

- write_control_ssw900[%QW6]: P685, value 0x1B (binary 0000 0000 0001 1011).
 - Bit 0 = 1 (start/stop).
 - Bit 1 = 1 (general enable).
 - Bit 3 = 1 (forward/reverse).
 - Bit 4 = 1 (remote mode).

These tags can be used during PLC program to create a logic in order to monitor and control devices.

7.2 ACYCLIC REQUESTS

Besides monitoring status data and writing control data, it is possible to create acyclic requests to access other device parameters.

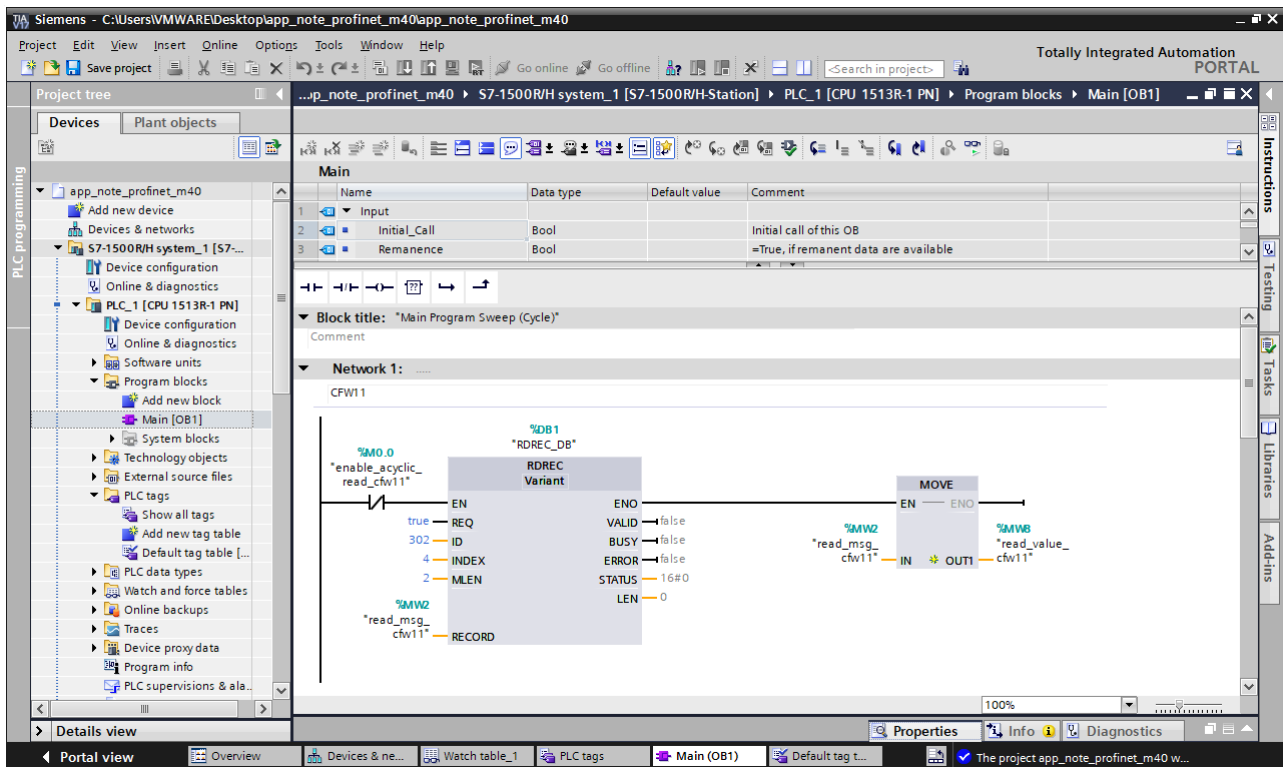


Figure 7.7: Create Acyclic Ladder

- ID - hardware identifier each device, as show in Figure 7.8.
- INDEX - parameter to be read.
- MLEN - parameter size in bytes.

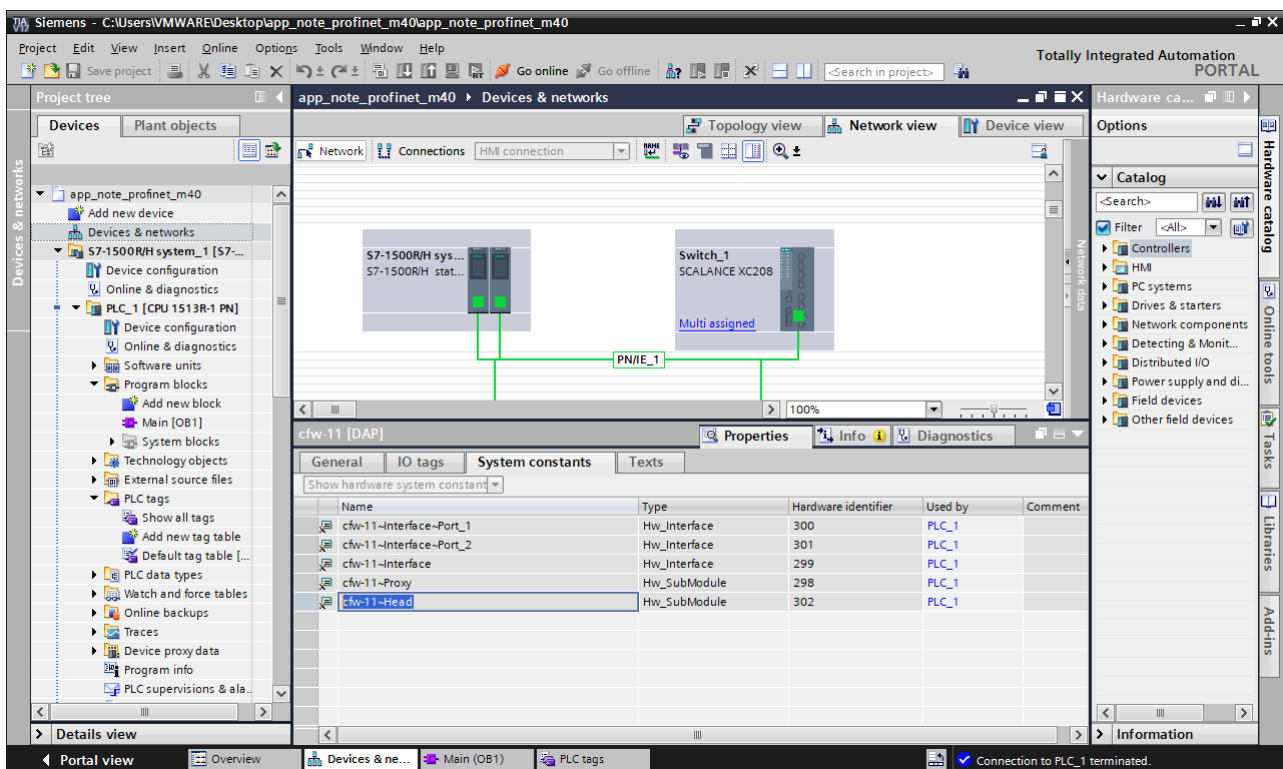


Figure 7.8: Hardware Identification

The other variables must be created in PLC tags.

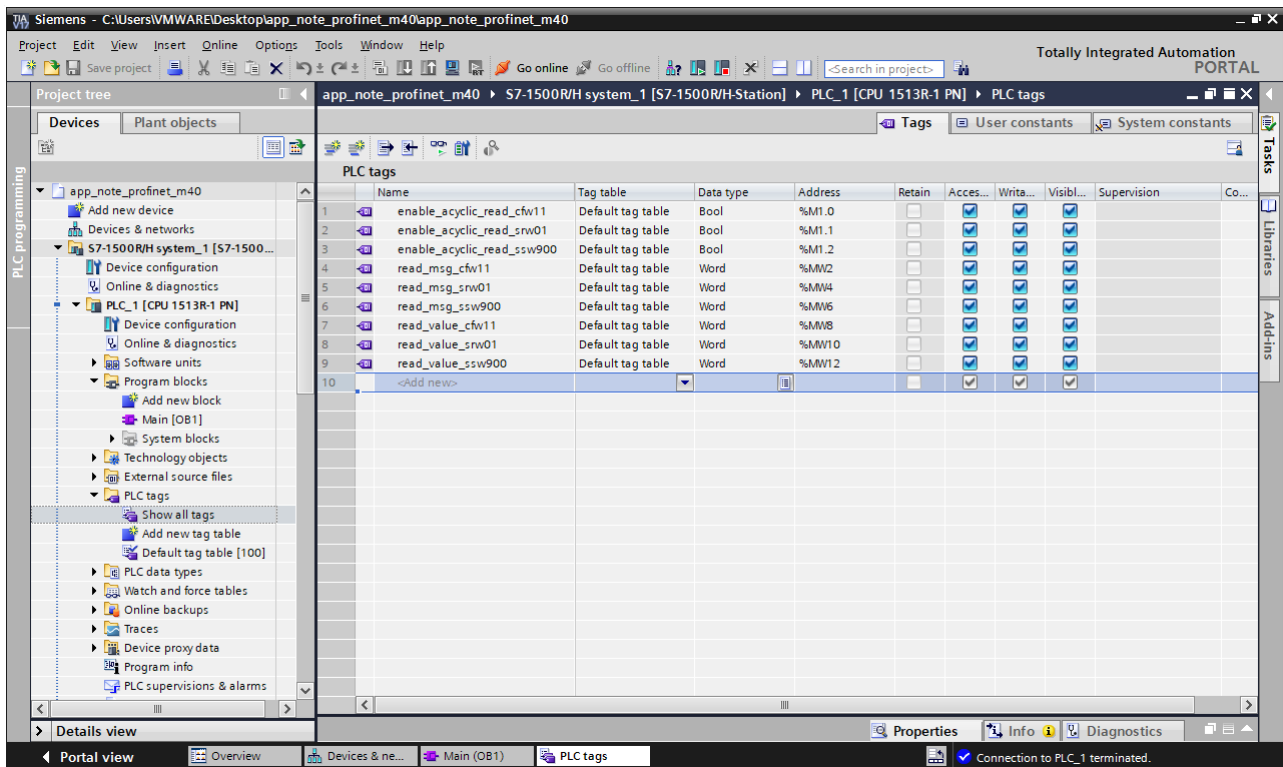


Figure 7.9: Create Tags Acyclic

Once defined the information for acyclic access, program a message at PLC logic. A "RDREC" instruction will be used to send such request. In online mode, it is possible to enable the block to send an acyclic request to read the parameter value.

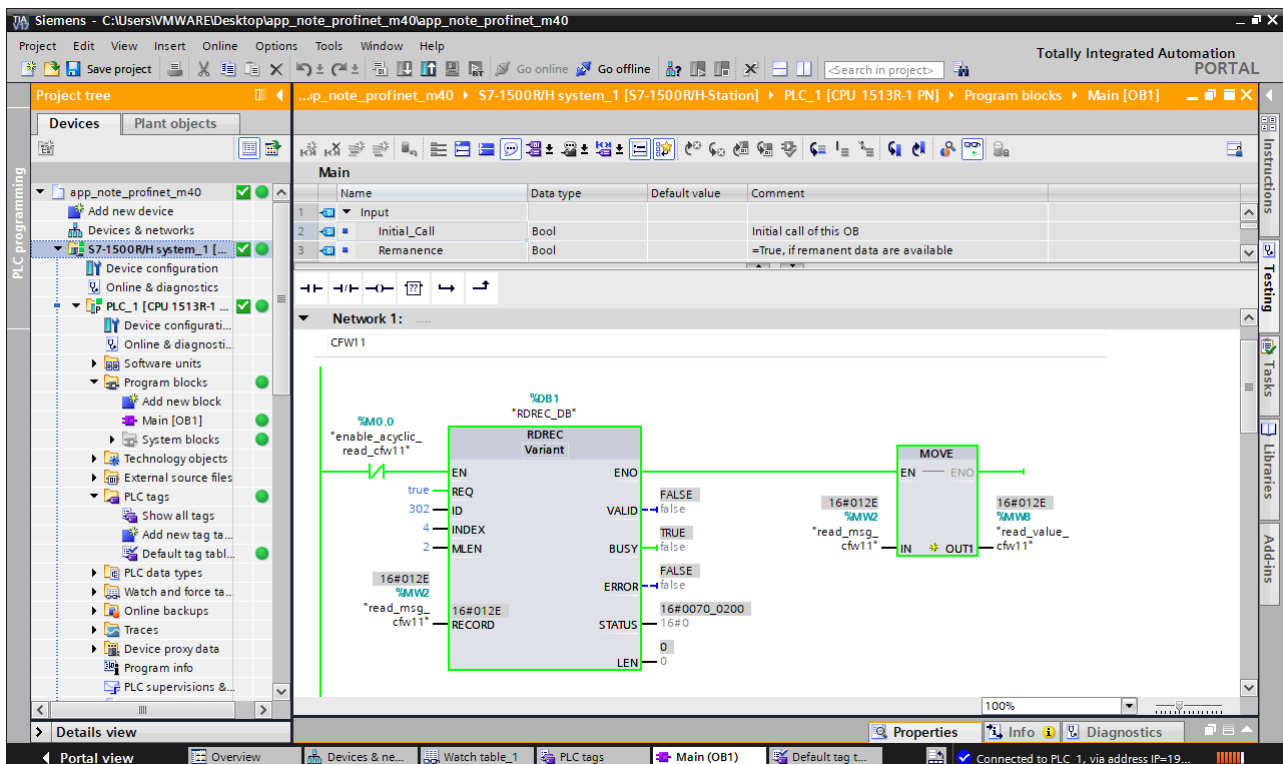


Figure 7.10: CFW11 Acyclic Online

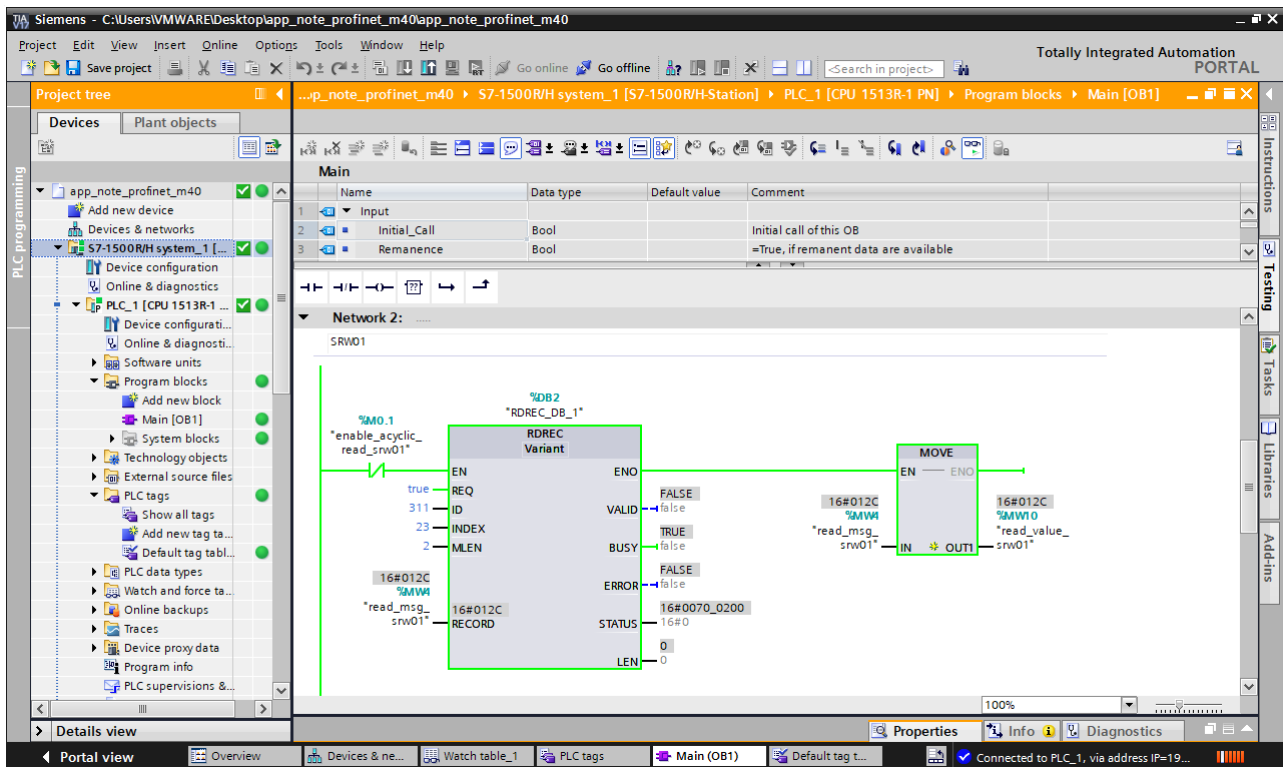


Figure 7.11: SRW01-ETH Acyclic Online

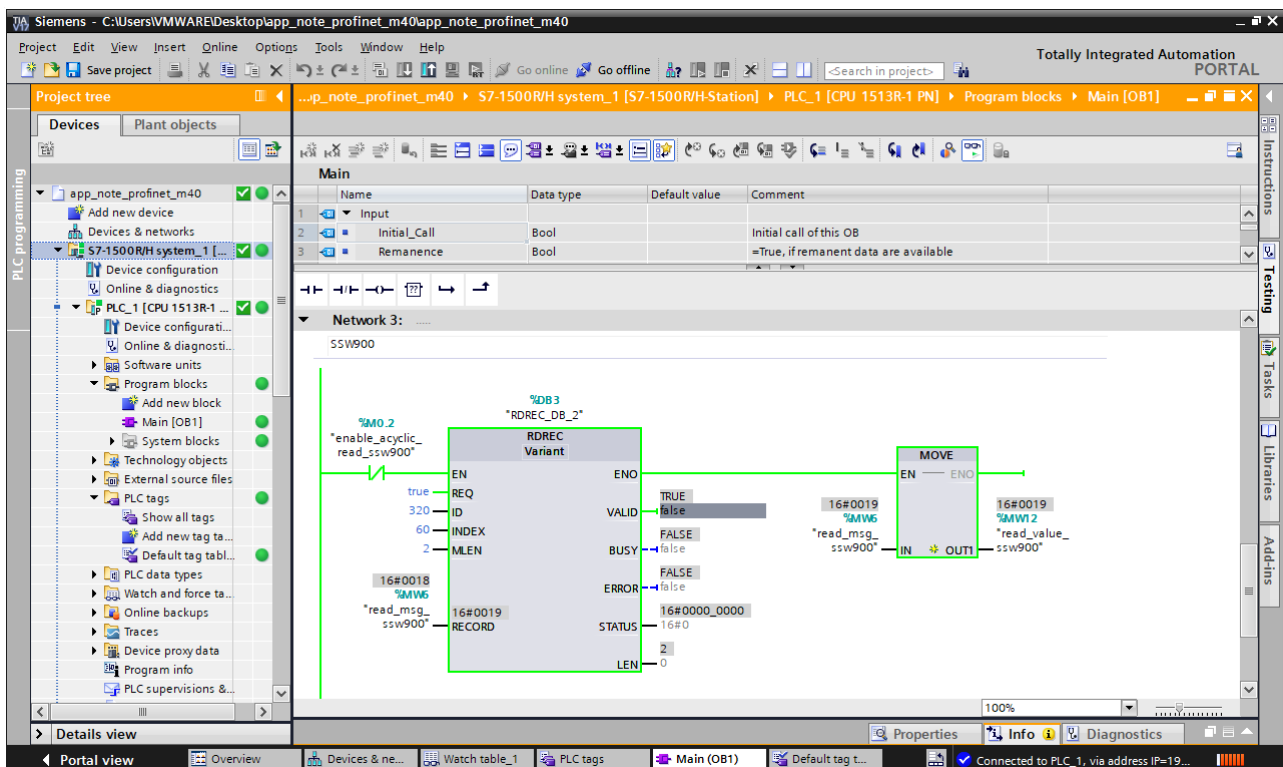


Figure 7.12: SSW900 Acyclic Online



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